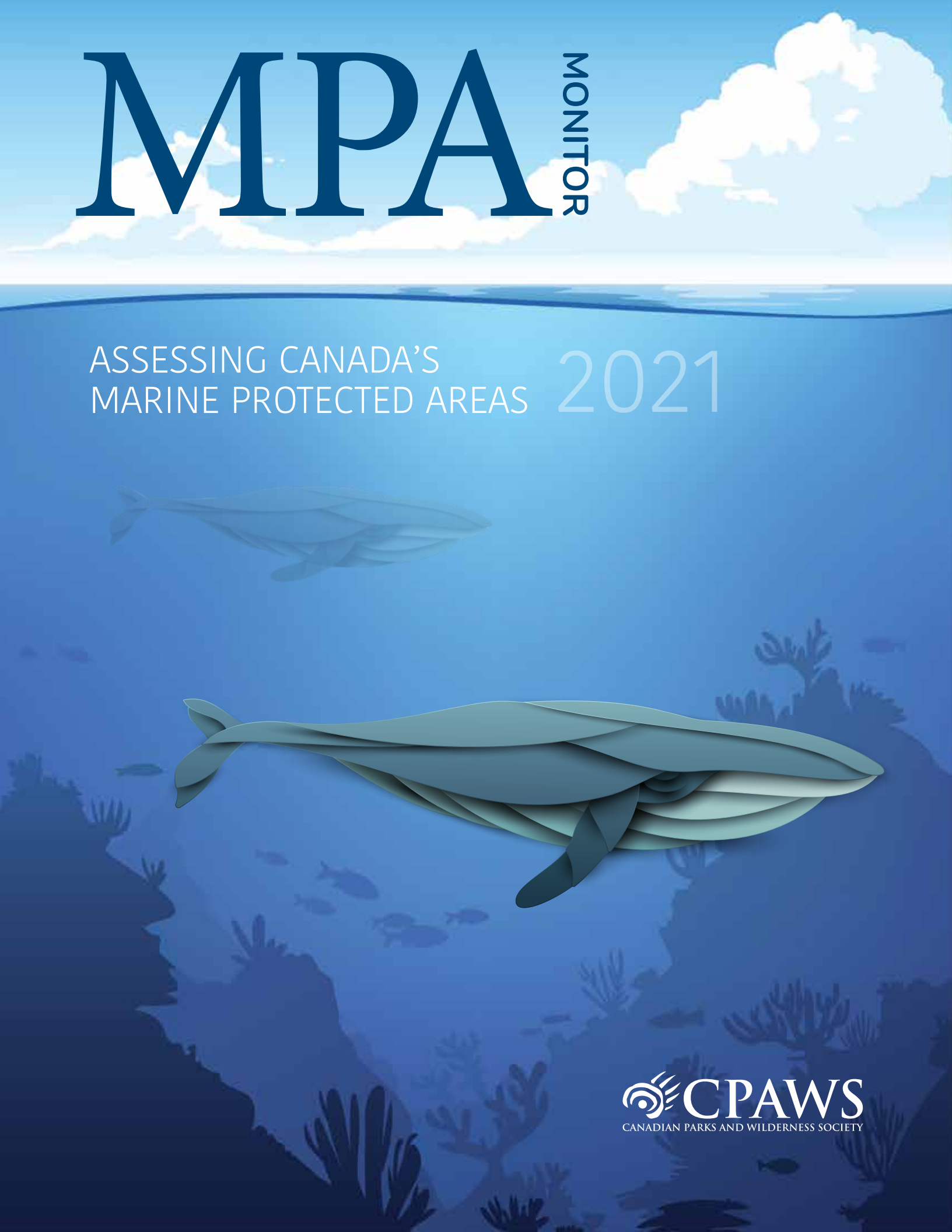
MPA MONITOR

ASSESSING CANADA'S MARINE PROTECTED AREAS 2021



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CANADIAN PARKS AND WILDERNESS SOCIETY

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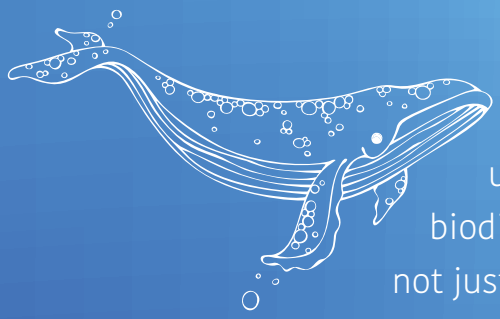


As the result of more than 100 years of industrial use and over-exploitation, the ocean is facing a biodiversity crisis that will have far-reaching impacts, not just for nature but also for human health and well-being the world over. In Canada, fisheries are edging closer to collapse, iconic species are teetering on the edge of extinction, and vital ecosystems like eelgrass and deep-sea coral and sponge reefs are disappearing. Science tells us that if we are going to reverse these declines, we must act now. Marine protected areas (MPAs) are recognized as one of the most effective tools to protect ocean ecosystems, rebuild biodiversity, and help species adapt to climate change.

In 2019, Canada announced that it had protected almost 14% of its ocean, and since then, has redoubled efforts and committed to protecting 25% by 2025 and 30% by 2030. These ambitious targets are consistent with scientific recommendations that we need to protect ***at least*** 30% of our ocean, and likely significantly more, to reverse biodiversity loss and restore ocean health and abundance by 2050.[1] [2] [3] In doing so, we will reap significant economic benefits, boost fisheries, and fight climate change, but only if MPAs are strongly protected and effectively managed. Notably, the recent recommendations from the High-Level Panel for a Sustainable Ocean Economy[4], of which Canada is a member, stressed the importance of protecting 30% in fully or highly protected MPAs as a critical component of a productive and prosperous blue economy.

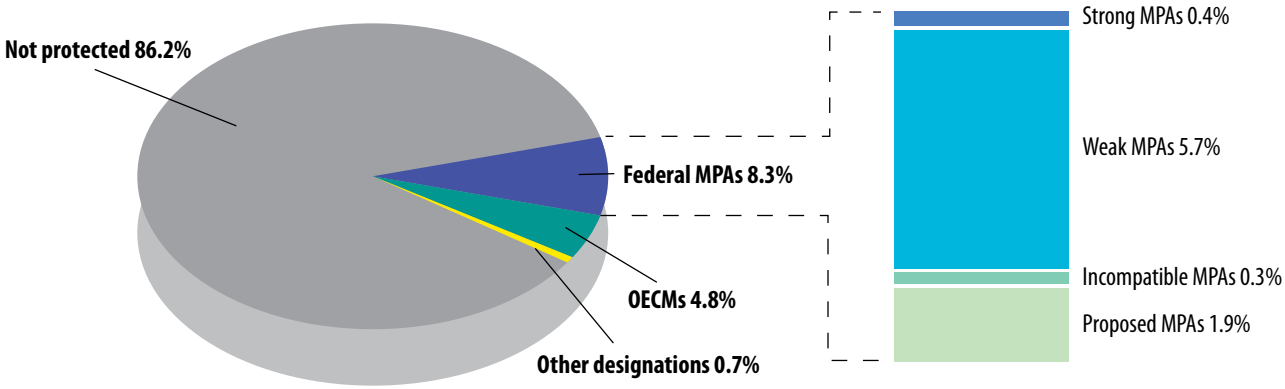
Achieving quantity and quality of MPAs: *The MPA Guide* and Minimum Protection Standards

Despite good intentions, many MPAs fall short of effective protection and national and international reporting of MPAs does not evaluate effectiveness; multiple studies suggest that most global datasets are overestimating protection.[5] [6] As a result, a global team of experts has spent the past several years developing *The MPA Guide*—a standardized assessment tool that evaluates the Stage of Establishment and the Level of Protection based on what activities are allowed within the MPA[7]. In doing so, *The MPA Guide* can identify weaknesses in protection and provide some indication of potential effectiveness. It also allows for MPAs to be compared across jurisdictions. This report is the first assessment of Canadian MPAs, in addition to being one of the first to employ *The MPA Guide*.

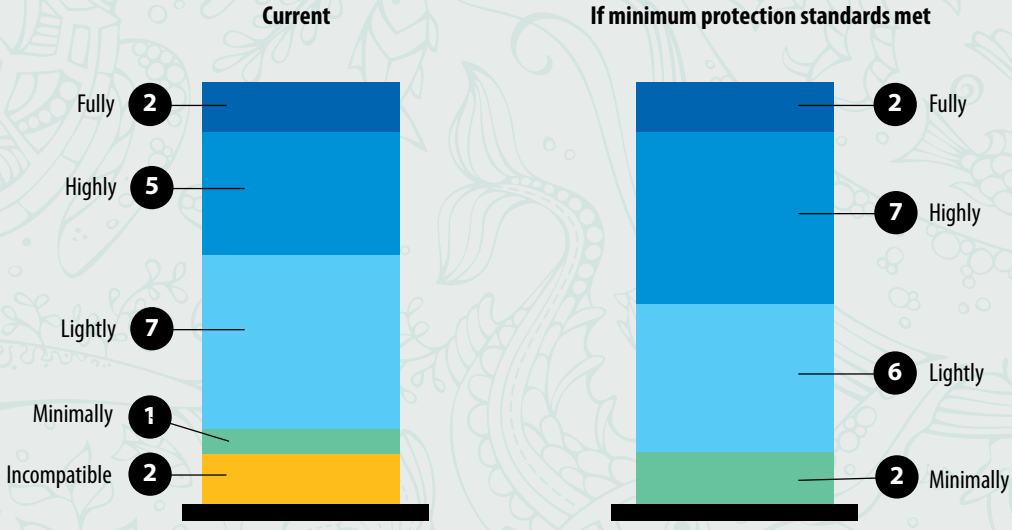
Photo Tala Cohen

In 2019, in response to concerns about the integrity of some Canadian MPAs, the Government of Canada announced minimum protection standards for all new federal MPAs that prohibit the most harmful activities: bottom trawling, oil and gas, mining, and dumping.[8] The government also committed to eventually review existing MPAs against the standards.

Percentage of Canada's Ocean Estate in federal MPAs by protection level, Other Effective Conservation Measures, and Other Protected Areas



Level of Protection by MPA



This analysis is intended to present an initial review of existing federal MPAs against both the minimum protection standards and *The MPA Guide* to evaluate the potential effectiveness of Canada's MPAs and make recommendations to address gaps and strengthen protections.

We assessed 18 MPAs established under the three primary federal legislative tools for MPA establishment, which together cover approximately 8.3 % of Canada's ocean estate.[9] It should be noted that there are other sites being counted towards Canada's marine protection targets which are not included in this analysis. The 18 sites considered here are arguably established and managed under the strongest and most comprehensive legal tools in Canada, and thus should theoretically represent the best protected MPAs.

Analysis identifies weaknesses in existing MPA regulations

Of the 18 sites reviewed, none met all four minimum protection standards in regulations alone, though three MPAs (Banc des Americains, SGaan Kinghlas-Bowie Seamount and Eastport) meet all four minimum standards in practice with activities prohibited through other means or unlikely to occur.

The MPA Guide scores sites by zone and does not include a method to create an overall MPA score. We adapted the Regulation-Based Classification System MPA index[10] to roll up the results into three categories. According to our analysis, **seven MPAs are strongly protected, eight are weakly protected, and two are incompatible with biodiversity conservation**. If the minimum protection standards were implemented nine MPAs would be strongly protected, eight would be weakly protected, and none would be incompatible with biodiversity conservation (though the Hecate Strait and Queen Charlotte Sound Glass Sponge Reef AMZ would still be incompatible due to exemptions for anchoring and infrastructure).

As the MPAs we assessed vary in size from 2 km^2 to 320,000 km^2 we also calculated spatial coverage by category. Our analysis found **that the 17 MPAs we evaluated contributed 0.4 % of Canada's ocean estate in strongly protected federal MPAs, 5.7 % in weakly protected MPAs, and 0.3 % in MPAs that are incompatible with conservation.** These numbers do not include Tallurutiup Imanga as this site has not yet been officially designated and therefore does not have regulations in place at the time of writing. It should also be remembered that these numbers do not include Other Effective Area Based Conservation Measures or other coastal protected areas that cover an additional 5.5 % of Canada's ocean estate and have yet to be assessed.

Recommendations to strengthen Canada's MPAs

The results of our area-based analysis are driven by a few large, unzoned and weakly protected or incompatible sites, two of which currently lack full legal protection: Tuvaijuittuq Interim MPA and Tallurutiup Imanga proposed National Marine Conservation Area (NMCA). As these sites have yet to be finally designated there is ample opportunity to strengthen protection levels. For example, freezing the footprint of activities in Interim MPAs will provide a degree of protection in places with limited use, such as Tuvaijuittuq, and may provide protection from potential new uses, however it will not address existing conservation concerns in more heavily used areas and so further protection measures will be required.

It can take several years to develop a management plan for some MPAs, which is a concern where there are ambiguities or a lack of detail in the regulations that may impede compliance and enforcement. Where management plans have been developed, they vary in the structure, content and level of detail presented. *The MPA Guide* may provide a useful framework to ensure that management plans are comprehensive, consistent, and systematic.

RECOMMENDATIONS

1. **Interim MPAs should be established with caution in areas where existing activities are impacting the ecosystem as freezing the footprint will not fully address existing threats. Additional protection measures will be required.**
2. **An interim management plan that clarifies ambiguities in the regulations and management of the site should be published for all *Oceans Act* MPAs, including Interim MPAs, and marine National Wildlife Areas, upon designation.**
3. **Where an MPA relies on protections provided by other jurisdictions or mechanisms, for example habitat protections or fisheries management measures under the *Fisheries Act*, the anticipated protections or prohibitions should be clearly reiterated in the MPA management plan as management directions.**

4 MPA management plans should be comprehensive documents that include all relevant information for the MPA, including spatial data on ecological values, human use, and management considerations; budget and staffing expenditures; enforcement and monitoring efforts; all relevant authorities and jurisdictions; and approved activities to-date.

5 MPA regulations and management plans should "future proof" sites by identifying and providing guidance on emerging threats, potential new uses and areas of growth.

Photo CPAWS

In running Canada's MPAs through *The MPA Guide*, some common issues and challenges surfaced. We offer specific recommendations to address these major concerns.

Fishing and trawling

Bottom trawling is permitted within five MPAs and another four MPAs allow for future trawling according to the regulations, although it is either not currently happening or is prohibited through other non-permanent means. Trawling is a highly destructive fishing method that is inconsistent with the minimum protection standards and deemed incompatible with conservation based on Resolution 66 adopted this year by the International Union for Conservation of Nature (IUCN). Commercial and recreational fishing activities were a common reason for an MPA or zone to be scored as lightly or minimally protected, rather than fully or highly protected.

6 **Bottom trawling, including scientific trawling, should be prohibited in all MPAs. Any MPAs or zones in which bottom trawling is allowed should not be counted towards Canada's marine conservation targets.**

7 **Where commercial and recreational fishing activities are permitted within MPAs, the MPA should include measures to manage and prevent future increases in fishing activity and reduce impacts. All fishing must be compatible with the conservation objectives of the MPA and managed according to international best practices, including intensive monitoring and effective bycatch mitigation.**

8 **Vertical zoning should be avoided at all costs in accordance with IUCN guidelines. It is challenging to enforce, does not respect benthic-pelagic connections, and increases overall traffic within the MPA.**

Oil and gas activities and mining

Oil and gas activities are exempt from the general prohibitions in three MPAs (The Gully, Scott Islands, Tarium Niryutait), though environmental assessments are needed before activities can proceed. In all instances, there are moratoria in place that currently prohibit any activity, but this leaves a worrying gap in protections should the moratoria be overturned. Three other sites (Hecate Strait Glass Sponge Reef, Gilbert Bay, and Musquash Estuary) specifically state that the regulations do not permanently foreclose on oil and gas opportunities. Two sites (Eastport and Basin Head) make no reference to oil and gas activites.

Deep-sea mining is not yet happening in Canada and no other mining activities are occurring within MPAs as far as we were able to discern. However, this is likely a growing area of interest. Most MPAs did not make any explicit reference to mining.

9 **Oil and gas activities and all forms of mining should be explicitly and permanently prohibited in MPAs. Any MPAs with oil and gas activities, mineral, or aggregate mining in any part of the MPA should not be counted towards the marine conservation targets due to the significant and far-reaching impacts on marine ecosystems.**

10 **The federal government should proactively work with Offshore Petroleum Boards and industry to relinquish licenses voluntarily.**

Photo Kim Conway

Dredging and dumping

Three MPAs either expressly allow or fail to prohibit dumping within their respective boundaries. Most older *Oceans Act* MPAs include an explicit prohibition against dumping, however that language has not been included in five recently established MPAs. Most importantly, there is no clear definition of what constitutes dumping in an MPA, and whether prohibitions include non-marine sources. Three MPAs provide exemptions for navigational dredging and another two allow for the maintenance and construction of marine infrastructure which may require some dredging.

11 **Canada needs a clear and comprehensive definition of dumping that is consistently recognized in MPA regulations. Future *Oceans Act* MPAs should reinstate the prohibition against "... depositing, discharging or dumping any substance, or causing any substance to be deposited, discharged or dumped..." for clarity.**

12 **All potential sources of pollution — both marine and upland — should be identified and long-term management objectives should be established to work with relevant authorities to proactively address these risks. These include effluent from upland mines, forestry operations and other industrial uses, sewage, agricultural run-off, as well as light and noise pollution.**

13 **MPA management plans should identify and map areas requiring dredging, along with any ecological features that may be impacted, and establish mitigation requirements.**

Photo Ruth Troughton

Anchoring and navigation

There are a range of impacts from vessel traffic that need to be considered in MPA planning, including collisions with marine mammals, noise pollution, and scouring from wake and propellors, however only anchoring and dumping were explicitly assessed in *The MPA Guide*. Six MPAs included prohibitions against anchoring in one or more zones.

14 **The impacts of anchoring and vessel use should be carefully considered in MPA planning and management plan development. Shipping and vessel use must be consistent with the conservation objectives of the MPA and subject to detailed review during MPA planning.**

15 **Anchoring should be prohibited in sensitive ecosystems within MPAs.[11] Voluntary restrictions on anchoring and voluntary avoidance areas for all navigation should be used to provide quick, temporary protection where needed. For coastal MPAs, mooring facilities should be provided to avoid anchoring in sensitive areas.**

Infrastructure

Infrastructure projects that are exempt from some MPA prohibitions include constructing and maintaining wharves, laying undersea cables, and potential oil and gas infrastructure. Two MPAs allow infrastructure that may be incompatible with the conservation objectives of the MPA and five MPAs allowed for moderate infrastructure. The creation of coastal MPAs provides an opportunity to invest in upgrading infrastructure that will benefit communities and reduce the footprint of human activities on marine ecosystems.

16 **MPA management plans should clearly identify the location, nature, and condition of existing and potential infrastructure, as well as sensitive habitats and species, and necessary mitigation measures. Long-term management objectives should be developed to improve coastal infrastructure, in partnership with other relevant jurisdictions.**

Aquaculture

Very few MPAs made any explicit reference to aquaculture operations in either the regulations or management plans. Given the breadth and complexity of activities associated with aquaculture, it requires much more detailed and comprehensive consideration in MPAs.

17 **Open-net pen finfish aquaculture should be prohibited from all MPAs. Other potential aquaculture activities—including developing technologies—should be carefully considered. Regulations and management guidelines should address dumping, entanglement risk, invasive species and species displacement, and the cumulative impacts of infrastructure and vessel traffic.**

Recreation and non-extractive activities

Most MPAs are intended to support non-extractive uses including scientific studies, recreation and tourism, and environmental education. Permits and authorizations are required for some activities, including research, but few MPAs provide details on approved activities. Three MPAs limit recreational vessel access to certain zones within the MPA.

18 **Where possible, research activities in MPAs should be limited to non-extractive and non-invasive methods. Activities and projects that have received approval should be publicly listed on the MPA webpage and summarized in the MPA management plan.**

Photo Jeff Isaak

Reaching 30% by 2030: using *The MPA Guide* as a framework

Canada has made ambitious commitments to significantly increase both the quantity and quality of MPAs. In doing so, we are charting a course to a healthy, resilient ocean that supports thriving and sustainable fisheries, and flourishing coastal communities. To realize this vision, we will need to double the area currently protected, while also addressing outstanding management issues, within the next eight years.

As a short-term solution for existing MPAs, management plans should be used to address any gaps in the regulations and provide explicit management directions for all potential activities and threats. However, regulatory amendments are required to provide assured, long-term protection. In many cases there are either existing management measures in place or activities in question do not currently occur, therefore strengthening regulations in line with minimum protection standards or *The MPA Guide* would have little short-term economic impact but potentially considerable long-term benefits.

19 ***The MPA Guide*** **can provide a useful framework for the consideration of current and potential future activities and expected benefits. For existing MPAs,** ***The MPA Guide*** **could be used to inform revisions to the management plan and for future MPAs it provides a useful framework for MPA planning and regulations.**

There are several factors that are not reflected in the Stage of Establishment or Level of Protection scoring system but are recognized as Enabling Conditions in *The MPA Guide* as they are as critical to MPA function. These Enabling Conditions include size and design, governance and equitability, strength of the conservation objectives, and available resources and capacity. Our analysis does not consider these enabling conditions as they were not finalized at the time of writing.

As Canada strives to protect 30 % of its ocean estate by 2030, it is important that quality is not sacrificed for quantity. There are several proposed MPAs and networks in the process of being designated that will be counted towards the 25 % and 30 % targets. Many of these sites are in busy coastal locations that are jurisdictionally complex and have been heavily exploited. Given the breadth and complexity of these issues there is a need to work more effectively across agencies and governments.

20 More robust processes or structures need to be put in place to support better coordination across departments and agencies to ensure that all activities are appropriately managed.

Overall, implementing minimum protection standards will provide Canada's MPAs with a base level of protection, and help ensure effectiveness. *The MPA Guide* will provide a robust framework to identify potential gaps in protection. With the longest coastline in the world spanning the Pacific, Atlantic and Arctic, Canada has a unique opportunity to set a global standard for marine protection and shore up its legacy as an ocean leader.

Photo CPAWS

INTRODUCTION – IT'S TIME TO INVEST IN OCEAN PROTECTION

"The ocean is not too big to fail, and it is not too big to fix. But it is too big to ignore."

— Dr. Jane Lubchenco, Marine Ecologist and Deputy Director for Climate and the Environment, White House Office of Science and Technology Policy

Biodiversity — the abundance and diversity of species — is essential to a healthy ocean. Like diversity in a financial portfolio or racial and gender diversity in an organization, biodiversity creates productive, strong, and resilient ecosystems. As the largest connected habitat on our planet, the ocean is crucial to life on Earth. It produces more than half of the oxygen we breathe, controls our weather patterns, absorbs 50 times more carbon dioxide than the atmosphere, and provides a significant amount of the world's protein.

With the longest coastline in the world and one of the largest ocean estates, Canada is home to some of the most productive and diverse marine ecosystems on the planet — from the largest animal to ever roam our earth, the blue whale, to ancient bacteria dwelling around deep ocean vents. But we rarely appreciate their roles within the ocean ecosystem. It is only when they no longer exist that we understand their value.

Economists have recently issued a number of loud warnings about the need to understand the real value of ocean ecosystems and protect them accordingly.[12] [13] Over the past century, industrial exploitation and climate change have pushed ocean ecosystems to their limits, triggering extinction rates up to 1000 times higher than expected naturally.[14] In Canada, we have seen (and mostly failed to act on) red flags that the ocean ecosystems on which we depend are at risk, from the historic collapse of the Newfoundland cod fishery to the recent collapse of the Milne Ice Sheet in Tuvaijuittuq.

> **"The ocean is like an investment account: to protect it from the unknown and unknowable, you've got to put part of it in a conservative portfolio as a 'rainy day' investment. In the same vein, we need to put part of our ocean portfolio in Marine Protected Areas. The general advice is that 30-year-olds should put 30% of their portfolio in a 'rainy day' investment — older people should increase this percentage according to their age. By this measure alone, one can say that 30x30 is long overdue."** *— Dr. Rashid Sumaila, Fisheries Economics Research Unit, University of British Columbia Institute for the Oceans and Fisheries*

The many benefits of marine protected areas

Strongly protected and properly managed marine protected areas (MPAs) are one of the most effective conservation tools to help protect and restore biodiversity and improve ecosystem functioning for the long-term. The International Union for Conservation of Nature (IUCN) defines a protected area as "a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values."[15] Like parks and protected areas on land, MPAs are intended to protect entire ecosystems, maintaining critical ecological connections between species and habitats. The IUCN definition upholds a position that unsustainable and industrial uses must be prohibited within MPAs.

The documented benefits of strongly protected MPAs include up to a 600 % increase in fish biomass and greater than 20 % increase in biodiversity, with cascading benefits for ecosystems when populations of large animals have been restored.[3] Fully protected MPAs also allow for the rebuilding of genetic variability and species age-structures that support increased productivity and resilience.[16] In doing so, MPAs can support fisheries as the increased biomass spills over into neighbouring waters.[17] MPAs can also be used to protect significant cultural features and carbon-rich coastal ecosystems like salt marshes and eelgrass beds.

Photo James Wheeler

DESIGNING MPAS FOR BIODIVERSITY, FISHERIES, AND CLIMATE

A ground-breaking study published in Nature[3] identifies a framework to prioritize MPA planning to achieve a hattrick of biodiversity protection, sustainable fisheries, and nature-based climate solutions. For the first time, this study quantified carbon released from the seafloor caused by activities like trawling that churn up sediments, releasing carbon into the water column that then travels back into the atmosphere.

The authors calculated that protecting *at least* 30% of our ocean is needed to achieve benefits. More emphasis is placed on coastal areas and the Exclusive Economic Zones (EEZ) of countries, as biodiversity and fisheries values are concentrated in coastal waters. The authors identified the Fundian Channel, Southern Grand Banks, and Central Coast of British Columbia as some of the potential key areas for MPAs in Canada. However, to achieve benefits such as the rebuilding of biodiversity and reversal of species decline, MPAs need to be strongly protected. Evidence shows that partially protected areas might stem further biodiversity loss, but generally do not support recovery and thus produce limited benefits for communities. Despite the clear benefits of designating strongly protected MPAs, only 2.7% of the global ocean is currently fully protected.[7]

Studies estimate the return on investment from strongly protecting 30 % of the ocean could be as much as 10:1, with significant benefits to the fishing and tourism sectors. Also highlighted is the potential for the creation of thousands of sustainable and meaningful jobs in MPA planning, management, and monitoring.[8] [18]

In addition to being strongly protected, science shows us that to be fully effective, MPAs also need to be: (1) well managed and sufficiently resourced,[19] (2) big enough to capture ecosystems and provide a buffer from harmful activities,[20] and (3) established in the most ecologically significant areas, not just the areas with least activity.[21] In Canada, MPAs can also play a central role in supporting reconciliation with Indigenous Peoples and equitable co-governance of resources.

The surge to 30% protection by 2030 – advancing the quality and quantity of Canada's MPAs

> **The ocean is like a checking account where everybody withdraws but nobody makes a deposit.** — *Dr. Enric Sala, National Geographic explorer in residence*

In 2010, Canada and the other 192 signatories to the United Nations Convention on Biological Diversity agreed to protect 10 % of the ocean by 2020, under what is known as Aichi Biodiversity Target 11.[22] An important step towards the protection levels needed, this target was critical in galvanizing international action to increase marine protection. After a sluggish start, in August 2019 Canada announced it had protected 13.81 % of its ocean. Since then, Canada has stepped forward as an international leader by redoubling efforts and committing to protect 25 % of the ocean by 2025 and at least 30 % by 2030. To support its burgeoning role as a leading voice for ocean protection, Canada has also joined the prestigious Global Ocean Alliance,[23] the High Ambition Coalition for Nature and People,[24] and signed the Leader's Pledge for Nature.[25]

In addition to surpassing the 10 % target, in 2019 Canada also announced minimum protection standards for its MPAs to strengthen protection and improve effectiveness. The commitment was made in response to recommendations from the National Advisory Panel on MPA Standards, which was in turn precipitated by a strong public backlash to a proposal to allow oil and gas activities within the Laurentian Channel MPA. The minimum protection standards prohibit oil and gas, mining, bottom trawling, and dumping in all new federally designated MPAs. The government also committed to reviewing all existing federal MPAs against the standards. Following the announcement, an interdepartmental task force was convened in 2020 for the purpose of defining and operationalizing the minimum protection standards to support implementation. This work is still underway.

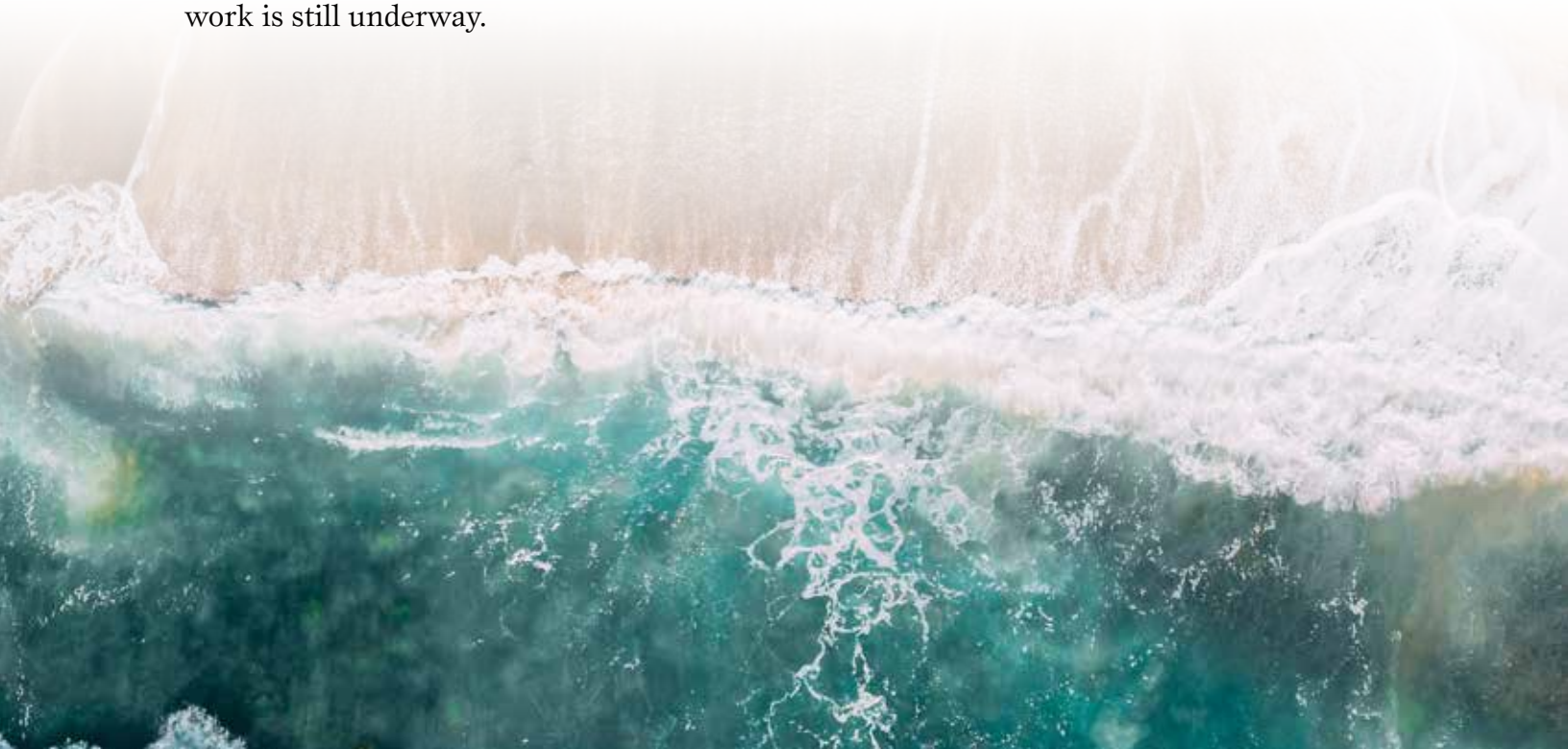


Photo Simon Hajducki

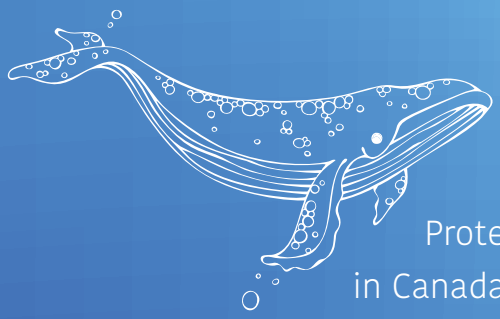
CANADIANS ARE STRONG SUPPORTERS OF OCEAN PROTECTION:

- 98% of Canadians support conserving more of the ocean in MPAs
- Nearly three out of four Canadians feel strongly about prioritizing ocean protection to sustain coastal economies, rather than allowing industrial activities in all parts of the ocean
- More than four out of five Canadians believe oil and gas, bottom trawling, and dumping should be excluded from MPAs.

(Source Environics)[26]

As Canada strives towards its ambitious protection target of 30 % of its ocean estate by 2030 a key question remains: in the fight against biodiversity loss and the pursuit of a sustainable and healthy ocean, how well-protected and well-managed are Canada's existing MPAs?

METHODS



Using *The MPA Guide* – A New Tool

Protection standards are not just an issue of concern in Canada. The specific challenges and issues vary from country to country, but a lack of strongly protected areas, and sites with exemptions for commercial and industrial activities, are common. This situation is exacerbated by the wide range of tools used to establish MPAs, the resulting array of different management measures and protection levels, and the lack of a shared language to describe and evaluate MPAs. This confusion impedes clear accounting of and decision-making around MPAs and likely feeds unrealistic expectations regarding predicted benefits.

Photo Dave Meckler

To address this situation, *The MPA Guide* has been developed by a global team of MPA experts with the goal of helping MPA managers and decision-makers understand the varying categories of MPAs and the conservation outcomes likely to be achieved across different levels of protection. It is designed to work directly with the IUCN protected area management categories,[12] adding two new metrics: (1) the MPA's Stage of Establishment and (2) its Level of Protection with the aim of establishing shared understanding and standardized assessment of MPA effectiveness.

The MPA Guide identifies four Stages of Establishment:

1. **Proposed or committed** – a boundary has been identified but no regulations are in place,
2. **Legally designated** by law – the site has been formally established and is reflected in legislation or regulation,
3. **Implemented** – a management plan has been developed and resources allocated, and
4. **Actively managed** – there is ongoing monitoring and adaptive management.

The MPA Guide builds on the Regulation-Based Classification System[7] for MPAs to evaluate a broader range of activities. The assessment of protection level is based on the impact of seven activities:

1. **Mining (including oil and gas)**
2. **Dredging and dumping**
3. **Anchoring**
4. **Infrastructure**
5. **Aquaculture**
6. **Fishing and harvesting**
7. **Non-extractive activities**

The level of impact of each activity is categorized according to intensity, scale, duration, frequency, and gear type or equipment used. Relative intensity and impact of activities are evaluated within the context of the conservation objectives of the MPA. The categories are developed according to the best available science and global best practices, including the IUCN guidelines for protected areas. *The MPA Guide* establishes four levels of protection:

1. **Fully protected —** minimal low impact activities occur, no extractive or destructive activities,
2. **Highly protected —** very limited extraction,
3. **Lightly protected —** some protection but moderate extraction allowed,
4. **Minimally protected —** moderate to heavy extraction with significant impacts for biodiversity.

Additionally, there are some activities in MPAs with impacts so great they are considered **Incompatible with biodiversity conservation**.

Photo CPAWS

To assess Canadian sites against these criteria, we reviewed MPA legislation, Regulatory Impact Assessment Statements (RIAS)[27], regulations, management plans, monitoring reports, feasibility studies, and other publicly available documents. We also consulted local experts where information was limited. Each MPA was evaluated by zone (where applicable). Scores were assigned for each activity and the overall score of each zone was bound to the lowest category of protection. For example, if bottom trawling was permitted in the zone, then the entire zone would be scored as incompatible with biodiversity conservation. While *The MPA Guide* does not present a method to roll up zone scores to provide an overall protection level for MPAs with multiple zones, we adapted the Regulation-Based Classification System using an ordinal scale of 1-5 where 1 = Fully protected and 5 = Incompatible.

$$\textbf{MPA Index} = \textbf{SUM}\ (\textbf{Zone}_i\ \textbf{Score x Zone}_i\ \textbf{Size / Total MPA Size})$$

This formula resulted in an overall index between 1 and 5, according to which the MPA was placed in one of five levels of protection: 1.0-1.9 = Fully protected, 2.0-2.9 = Highly protected, 3.0-3.9 = Lightly protected, 4.0-4.9 = Minimally protected, 5.0 + Incompatible.

EXAMPLE: BANC-DES-AMÉRICAINS

Zone 1 = Fully protected: (1 x 126.5 km² / 1000 km²) = 0.1

Zone 2 = Lightly protected (3 x 873.5 km²/ 1000 km²) = 2.5

MPA Index = Zone 1 + Zone 2 = 2.6 = Highly Protected

Evaluating minimum protection standards in Canada's MPAs

In addition to *The MPA Guide*, we also evaluated existing MPAs to determine whether they met the minimum protection standards. Canada has committed to reviewing existing MPAs against the standards during management planning cycles. An MPA was considered to meet the minimum standards if the entire MPA prohibited all four activities: oil and gas, bottom trawling, dumping and mining. We reviewed the regulations and management plans for exemptions, explicit references to activities, or clear omissions. We define oil and gas activities as including both exploration and extraction activities. Mining includes both deep-sea mining and mining for aggregates. Bottom trawling includes industrial scallop dredging, dragging, and hydraulic dredging. Navigational dredging was not included as the minimum protection standards announced only apply to mobile bottom-contact fishing gear.[8] We note that navigational dredging is permitted within several MPAs and is assessed by *The MPA Guide*. Dumping is considered to include any liquid or solid substance from marine-based sources. Agricultural and upland run-off is mentioned as a potential issue for more than one MPA, however we do not include it in this assessment as it was not consistently or comprehensively addressed across MPAs. Nevertheless, this is an issue that warrants more consideration and we do raise it in our recommendations.

Photo Shutterstock

Zones or MPAs were considered to *meet* the standards if an activity was prohibited without exception in the regulations and were considered to *not meet* the standards if there was a clear exemption in the regulations for an activity. Finally, an activity was "unclear" if either: (1) the regulations were ambiguous or did not explicitly address a likely activity (e.g., the absence of the explicit dumping prohibition in recent *Oceans Act* MPAs); (2) if there were other management measures in place but they lacked permanence or longevity (e.g., oil and gas moratoria that are policy-based); or (3) if an activity was not currently occurring in the MPA but it was not clear if the regulations would prohibit it in future (e.g., bottom trawling in Arctic sites).

For zoned MPAs, we evaluated each zone independently and then combined scores. An MPA was deemed to meet the minimum protection standards if every zone met all four minimum standards. If at least one minimum standard was contravened in every zone, the whole MPA was deemed to not meet the minimum protection standards. MPAs that contained a combination of zones that met and did not meet the minimum standards, or zones that were unclear, were categorized as "partially protected/unclear".

ASSESSING CANADA'S MPAS

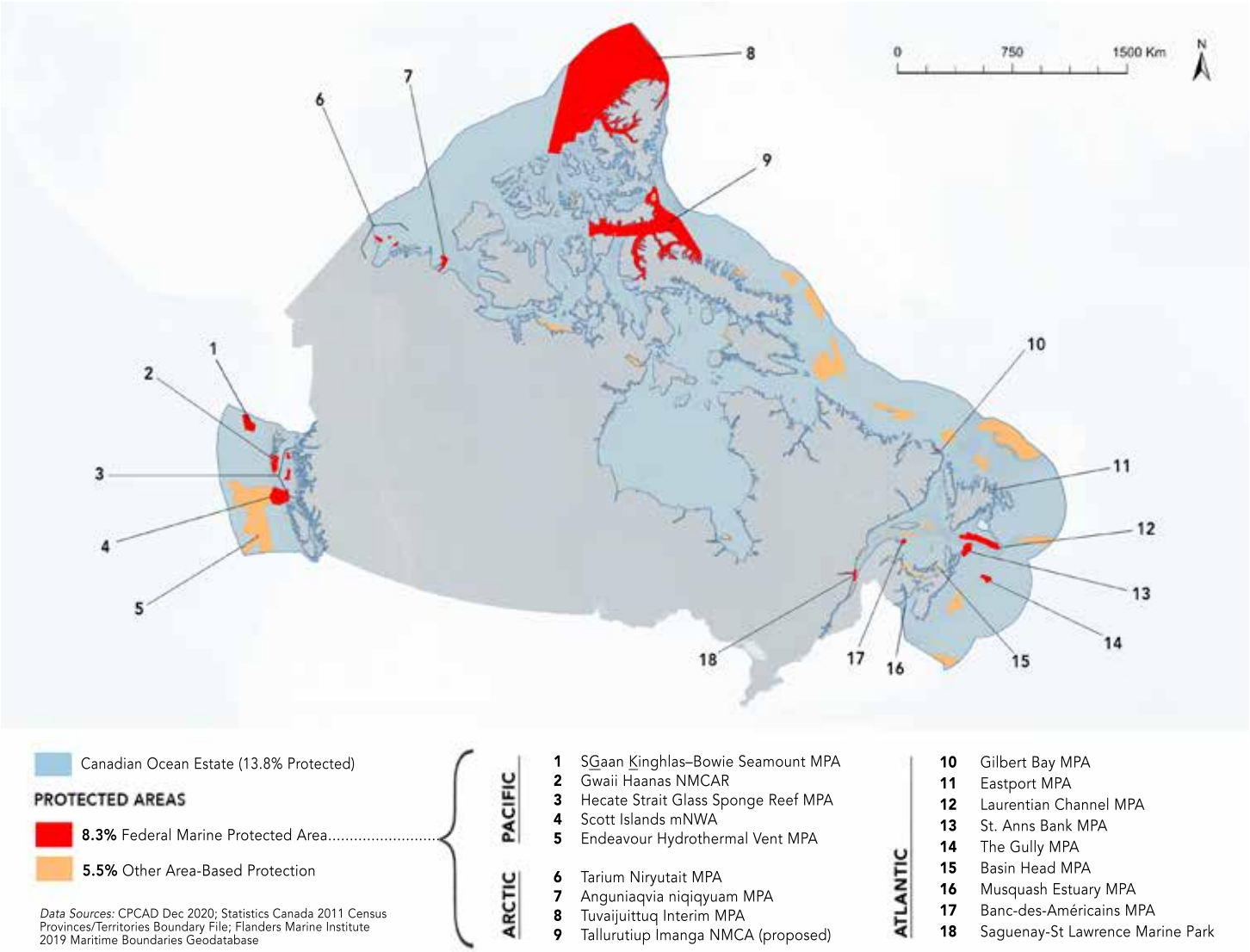
Within Canada, marine activities and MPAs are managed and regulated under a complex web of legal and policy-based tools. Canada counts a suite of different sites and designations towards its marine conservation targets. These include federal MPAs, Other Effective Area-Based Conservation Measures (also known as OECMs or Marine Refuges), Migratory Bird Sanctuaries and National Wildlife Areas, and protected areas designated by provincial governments.

This analysis focuses on MPAs established under the three primary legal tools for the designation of protected areas in the marine environment as these provide the most comprehensive protection from marine activities. These are:

- *Oceans Act* MPAs established by Fisheries and Oceans Canada (DFO) under the *Oceans Act* and Interim MPAs established through a Ministerial Order,
- National Marine Conservation Areas (NMCAs) established by Parks Canada Agency (PCA) under the *National Marine Conservation Areas Act* (NMCA Act), and
- Marine National Wildlife Areas (mNWAs) established by Environment and Climate Change Canada (ECCC) under the *Canada Wildlife Act*.

Photo Shutterstock

Figure 1: Map of Canadian federal MPAs and other area-based protection



Oceans Act MPAs

Every *Oceans Act* MPA is protected by a general prohibition in the regulations for any activity that "disturbs, damages, destroys or removes" marine organisms or their habitat, with slight language variations. Most older *Oceans Act* MPAs include a second prohibition against "depositing, discharging or dumping any substance, or causing any substance to be deposited, discharged or dumped…that is likely to result in the disturbance, damage, destruction or removal of a living marine organism or any part of its habitat." Following these prohibitions is a list of exceptions for activities that are allowed within the MPA. Exempted activities vary by MPA, but can include scientific research, commercial fishing, navigation, and even oil and gas activities. Most, but not all, *Oceans Act* MPAs are spatially zoned, with each zone having separate prohibitions and exemptions. Zoning is not a requirement of *Oceans Act* MPAs.

VERTICAL ZONING

Vertical zoning applies different management measures to different sections of the water column based on depth. Typically, this type of zoning is used to protect seafloor ecosystems while the surface waters remain open to multiple uses, including pelagic fishing and navigation.

In British Columbia, the Hecate Strait and Queen Charlotte Sound Glass Sponge Reef MPA comprises three zones:

- The Core Protection Zone (CPZ) contains the reefs, seabed, and subsoil as well as the water column from the seabed to a minimum of 40m from the highest point of each reef.
- The Adaptive Management Zone (AMZ) surrounds the CPZ horizontally and is designed to mitigate risks of sedimentation and accidental damage to the reefs.
- The Vertical Adaptive Management Zone (VAMZ) extends above the horizontal extent of the CPZ to the sea surface and is intended to mitigate direct impacts and risks to the reefs while allowing pelagic fishing.

This is currently Canada's only vertically zoned MPA, though some OECMs[28] are benthic fishing closures without restrictions on pelagic fishing activities and are thus vertically zoned. The IUCN upholds a strong presumption against vertical zoning in MPAs because it fails to respect ecological connectivity between benthic and pelagic ecosystems and is challenging to enforce.[15]

National Marine Conservation Areas

National Marine Conservation Areas (NMCAs) are established and managed by PCA with the dual mandate of protection and sustainable use. The NMCA Act requires a final management plan for the NMCA within five years of designation and an interim management plan to guide users in the meantime. Gwaii Haanas National Park Reserve, National Marine Conservation Area Reserve (NMCAR), and Haida Heritage Site is the first and only site to be designated under the NMCA Act, though several more sites are proposed. The Saguenay-St. Lawrence Marine Park was also established by PCA and Québec, but pre-dates the NMCA Act and is regulated by its own legislation that is mirrored by the federal and provincial governments.

Photo Peter Lloyd

The NMCA Act has several specific prohibitions that create a baseline of protection for all NMCAs. Prohibitions include disposing of or occupying public lands, thereby preventing commercial and industrial activities that would require leases or tenures such as aquaculture. The Act also prohibits the exploration or exploitation of hydrocarbons, minerals, aggregates, or any other inorganic matter, as well as the disposal of any substance within an NMCA (unless authorized by a permit). However, exceptions to all these prohibitions may be provided. Finally, every NMCA must include at least one zone that "fully protects special features or sensitive elements of ecosystems."

Marine National Wildlife Areas

Marine National Wildlife Areas (mNWAs) are established by ECCC using the Protected Marine Area Regulations of the *Canada Wildlife Act*.[29] It should be noted that these are different to the regulations for other National Wildlife Areas. The Protected Marine Area regulations are similar to the general prohibition under the *Oceans Act*, with additional specific prohibitions as relevant. The first and only mNWA, the Scott Islands in British Columbia, was designated in 2018. To be considered for designation as an mNWA, a site must contain "nationally significant" habitat for migratory birds, support wildlife or ecosystems at risk, or represent a rare or unusual wildlife habitat or biogeographic region.[30]

Managed marine activities

Other federal and provincial agencies and Indigenous governments also manage and influence marine activities in (and beyond) federal MPAs. For example, Transport Canada regulates shipping, and provincial governments have authority over tenures and seafloor activities to varying degrees. Indigenous governments have signed Land Claims Agreements and fisheries agreements, and Indigenous Peoples in Canada have constitutionally protected rights to fish.

A SPECIAL CASE: OFFSHORE PETROLEUM BOARDS

On the Atlantic coast, two offshore petroleum boards — the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) and Canada-Nova Scotia Offshore Petroleum Board (C-NSOPB) — oversee joint responsibility between the provincial and federal governments for offshore oil and gas resources under *Accord Acts*.

Notably, the *Accord Acts* take precedence over other legislation, including MPA legislation, which means that oil and gas activities cannot be prohibited in an MPA in these regions without the agreement of the Offshore Petroleum Boards.

Oil and gas activities are explicitly prohibited under the NMCA Act but not the *Oceans Act* or the *Canada Wildlife Act*; though the general prohibition of activities that "damage, disturb or destroy" would seemingly address the potential impacts of oil and gas exploration. Recent amendments to the *Oceans Act* and *Canada Petroleum Resources Act* allows for oil and gas leases to be rescinded for future MPAs. To date, this power has never been applied, and is not applicable where there are *Accord Acts.*

There are presently oil and gas moratoria in place in British Columbia, Québec, and the Arctic. The Arctic moratorium was implemented with a commitment to undertake a scientific review every five years. The first review is due at the end of this 2021. In Nova Scotia, the C-NSOPB prohibited oil and gas exploration inside MPA boundaries for St. Anns Bank and The Gully MPA. However, these policy measures lack permanence. In Newfoundland and Labrador, the C-NLOPB recently opened a call for bids for exploration licenses within a newly established OECM that is being counted towards Canada's marine conservation targets.[31]

Reviewing prohibitions and exemptions in Canadian MPAs

Fishing and trawling

The MPA Guide considers both gear type and overall intensity of fishing activity in its impact scores. Fishing gear types can impact marine habitats and communities in a variety of ways — through direct physical damage to ecosystems, ecological impacts from removal of target species, and accidental catch of non-target species including marine mammals and birds. High-impact gears (including bottom trawls and dredges in which heavy gear is dragged along the seafloor) are the most destructive of fishing practices, destroying seafloor habitat, unselectively catching fish, and churning up seafloor sediments. Midwater trawling is also known to hit the seafloor.

The minimum protection standards announced by the Government of Canada in 2019 include a prohibition against bottom trawling, which would include dragging and dredging. Consistent with the IUCN, *The MPA Guide* identifies trawl and dredge fisheries as singularly harmful and incompatible with biodiversity conservation. Other fixed gear, like traps, may damage sensitive habitats though they have a smaller footprint, are more selective, and are less prone to bycatch. The exception is lost gear, also known as "ghost gear," which can continue to catch and kill fish decades after it is lost. Large scale pelagic and benthic long lining as well as other highly unselective gear (e.g., gillnets) can pose a risk to ecosystems from unintended bycatch and entanglement, as well as causing significant trophic impacts when done at a large scale.

Tageting top predators, such as tuna and sharks, and removing significant numbers of meso-predators like salmon and cod, can also seriously impact marine food webs.[32] Ecosystem effects are not just limited to predators; overfishing of key foundation species such as herring and sardine can have serious consequences for whales, seabirds and other fish that depend on these species as their food source. Selective fishing pressure, even at "sustainable" levels, is known to decrease the size and age-class of fish, reducing the number of larger, older fish which are typically the most fecund, therefore reducing reproductive and replenishment rates.[33]

Figure 2. Trawling prohibition in MPAs concurrent with minimum protection standards by region and nationally. Percentages represent the proportion of the total area covered by MPAs.

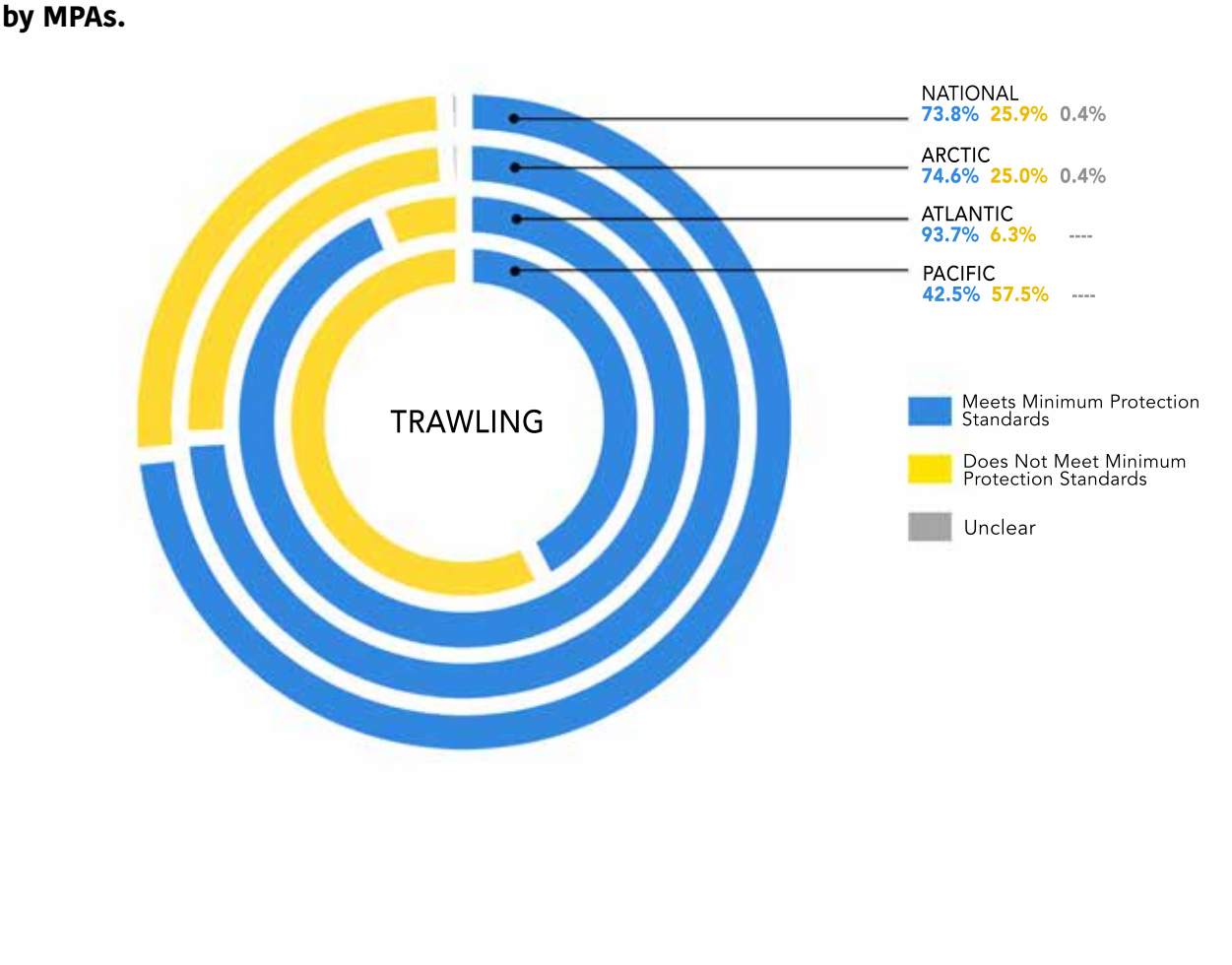


Photo Mark Timberlake

Photo Nick Hawkins

Management

In Canada, fishing (commercial and recreational) is primarily regulated under the *Fisheries Act.* NMCAs and mNWAs require direction from the Minister of Fisheries and Oceans on fisheries management, including the restriction or prohibition of a fishing activity. Most, but not all, MPAs include a distinct exemption for Aboriginal fisheries in accordance with the constitutionally protected rights of Indigenous Peoples. We did not consider Indigenous fishing activities in this analysis. We recognize the strong connection between Indigenous Peoples of Canada and marine resources and note that the scale of Indigenous fishing is generally much smaller than non-indigenous commercial fishing. The Government of Canada has committed to reconciliation with Indigenous Peoples, and this will include not only co-governance of marine resources but also access to those resources. However, it still must be recognized that any form of fishing will have some degree of effect on the local marine ecosystem, and therefore the functioning of the MPA, and this must be considered in calculating the anticipated benefits.

Our assessment of fishing activity was based on available information about historical and current fishing activities in MPA Regulatory Impact Assessment Statements (RIAS) and management plans, as well as prohibitions or exemptions on gear type. We found that most sites lacked detailed information about the precise location, intensity, and types of fishing activities, simply listing permitted and/or prohibited gear types or target species. It should be noted that the regulations, RIAS, and management plans do not reference scientific bottom trawling. Prohibitions on commercial and recreational bottom trawling **do not apply** to scientific trawling, which is occurs throughout in Canada.[34]

Six MPAs (Anguniaqvia niqiqyuam, Laurentian Channel, St. Anns Bank, Banc-des Américains, The Gully, and Gwaii Haanas) have zone(s) that are entirely closed to commercial and recreational fishing. SGaan Kinghlas-Bowie Seamount is closed to all commercial fishing; recreational fishing is allowed but is minimal due to the location. Most MPAs allow some commercial and recreational fishing to occur. Five MPAs (Scott Islands, Gwaii Haanas, Saguenay-St Lawrence, Musquash Estuary and Gilbert Bay) permit bottom trawling within a portion of the MPA which was therefore considered to be incompatible with the conservation objective. In some instances, the trawling footprint may only cover a small portion of the MPA or zone, however, the regulations do not reflect this, and therefore technically the activity could expand throughout the zone. For that reason, the entire zone (or in the case of both the Scott Islands and Saguenay-St. Lawrence the entire MPA) was scored as incompatible with biodiversity conservation.

Two sites (The Gully and Basin Head) provide unclear protection from bottom trawling. Trawl fisheries for cod have been under moratorium on the Eastern Scotian Shelf since 1993. The Gully RIAS notes that should the moratorium be reduced or lifted, interest in trawling in this area may be renewed. As the regulations are currently written there is potential for trawling to be permitted in Zone 3 if it is deemed to meet the exception requirements.[35] Similarly, Zone 3 of Basin Head is now overlapped by the Scallop Buffer Zone OECM which prohibits bottom trawling.[36] The OECM is a fishing closure implemented through a variation order, and while OECMs are intended to provide long-term protection, they currently lack permanence.

Three sites (Tallurutiup Imanga, Tuvaijuittuq and Tarium Niryutait) do not have regulations that prohibit bottom trawling, though the activity is not currently happening. However, the absence of activity does not equate to long-term protection. Tarium Niryutait allows for all fishing activity to occur in accordance with the *Fisheries Act*. Presently, there is no commercial fishing activity, including bottom trawling, but the management plan acknowledges the potential for new activities.

Mining

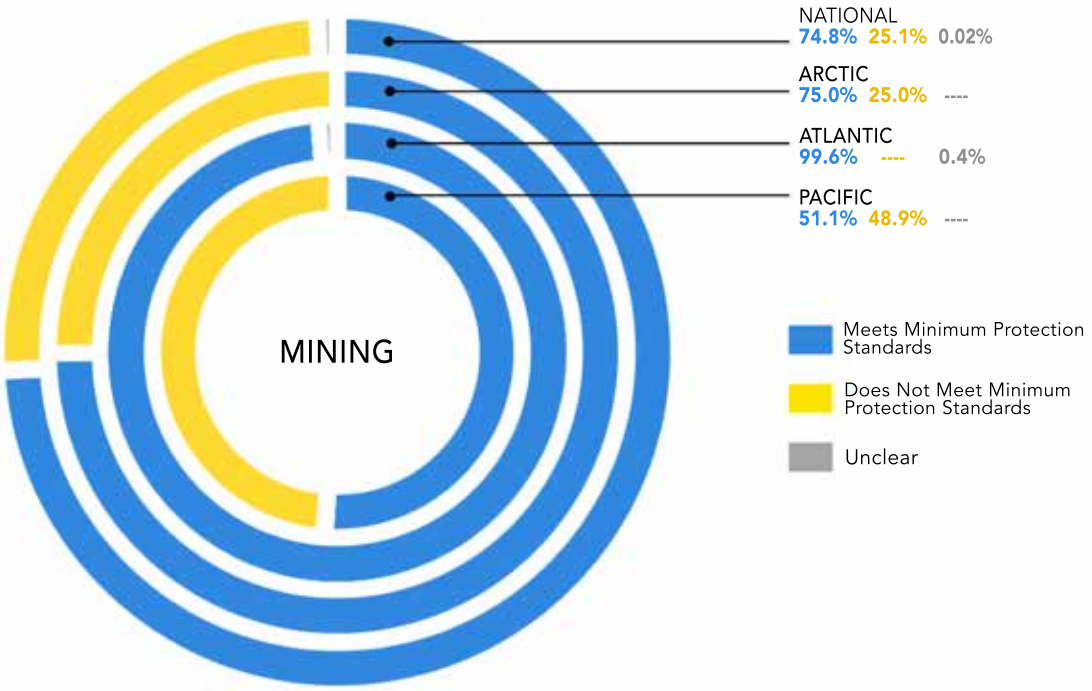
There is currently no deep-sea mining happening in Canada; however, this is a rapidly growing sector globally. Plundering the seabed for minerals and metals risks irreversible wildlife loss and the disturbance of essential carbon stores.[37] Sediment plumes and toxic waste discharge can travel through the water column and damage nearby seamounts and cold-water reef systems and potentially poison marine life. Light and noise pollution from infrastructure and operations can also disrupt species that have evolved for a life in the dark. There is a growing push for a global moratorium on deep-sea mining until ecological and environmental concerns can be addressed.[37] Other types of mining for aggregates like gravel and sand do occur in Canada but are rarely addressed in MPA impact assessments or management plans. even where there are other measures in place that limit or prohibit activities.

Management

The NMCA Act expressly prohibits mining (although exceptions may be provided), and the *Oceans Act* and *Canada Wildlife Act* general prohibition of any activity that "damages, disturbs or destroys" should, in theory, prevent any potential activities. It is also worth noting that the province of Prince Edward Island has a moratorium in place on mining sand in the nearshore.[38]

Only one site, the Scott Islands, included an exemption for potential mineral extraction activities. The RIAS for the Scott Islands notes the presence of potential energy and mineral deposits. The RIAS emphasizes that activities could be permitted if it could be demonstrated that they would not compromise conservation. The Endeavour Hydrothermal Vents management plan also notes that the MPA has limited mineral/metal deposits of value and mining is banned under the general prohibitions. Mining is not explicitly excluded from Musquash Estuary and the RIAS notes that the MPA regulations do not foreclose all opportunities in perpetuity.[39] However, no mining activities are currently taking place, and all existing mining licenses have expired.

Figure 3. Mining prohibition in MPAs concurrent with minimum protection standards by region and nationally. Percentages represent proportion of the total area covered by MPAs.



Oil and gas

From exploration to production to transportation, all aspects of the oil and gas industry pose a grave risk to marine species and ecosystems. Seismic surveys, used to find oil and gas deposits, emit pressurized blasts that can be felt up to 4,000 kilometers away,[40] and can cause physical injuries, changes in behaviour, and kill zooplankton.[41] Stranding events, deaths, and population declines of whale species are also well-documented.[42] The impacts of catastrophic oil spills in the offshore are all too well known. The Exxon Valdez and more recent Deep Water Horizon spills have both inflicted longstanding harm on marine ecosystems and communities killing hundreds of thousands, possibly millions, of birds and contaminating fish and shellfish.[43]

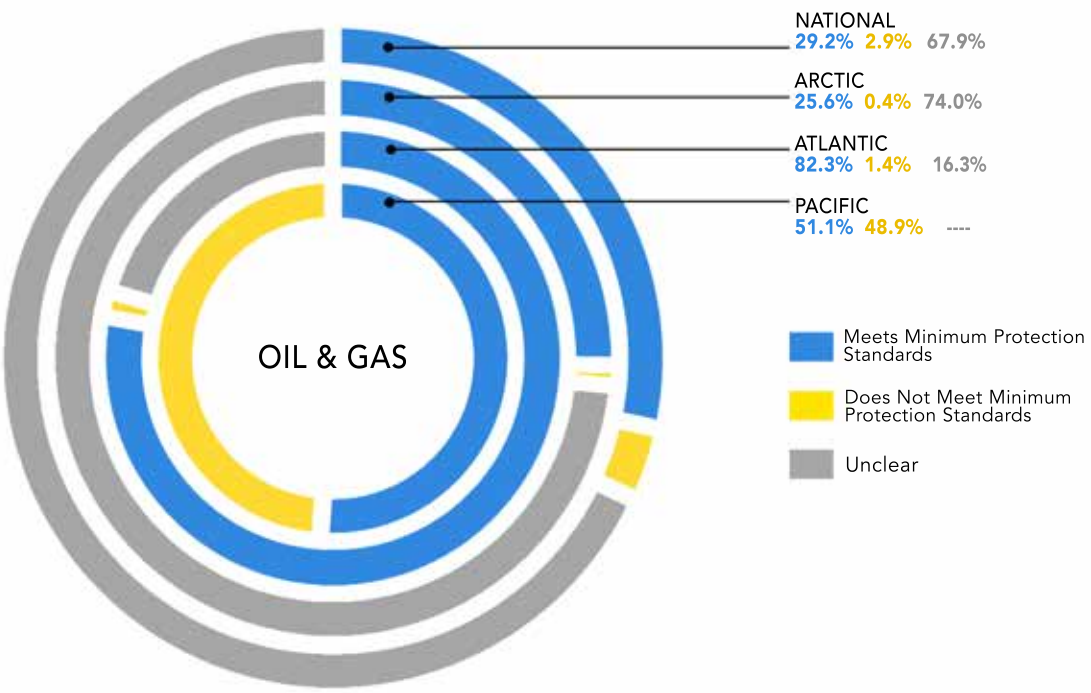
Where oil and gas activities have been proposed in MPAs, Canadians have spoken loudly and in large numbers against them. This is an issue that unites fishers, conservationists, tourism operators, coastal communities, and many Indigenous communities as they all face considerable risks from spills. According to Canada's Blue Economy Strategy Engagement Paper, the offshore oil and gas sector creates fewer jobs than any other marine sector, including tourism and seafood.[44] It also contributes less towards Canada's gross domestic product than seafood and not much more than tourism and recreation. Conversely the risk to both those sectors from oil and gas activities is considerable.

In our analysis, we assumed that oil and gas activities were prohibited in the MPAs we analyzed unless exemptions or allowances were explicitly defined in the regulations, management plans, or other official documentation (See **A Special Case: Offshore Petroleum Boards)**. We are concerned, however, that policy-based moratoria may lack the permanence of legislated prohibitions.

Management

Three MPAs (The Gully, Scott Islands and Tarium Niryutait) recognize and uphold existing oil and gas leases and rights and therefore do not meet the minimum protection standard. All three sites have policy-based moratoria in place, so there is no current risk, but policies may be overturned in the future. Two MPAs (Eastport and Basin Head) made no reference to oil and gas activities in any of the MPA regulatory or management documents. Two MPAs (Gilbert Bay and Musquash Estuary) noted that that the prohibitions did not foreclose on all opportunities in perpetuity. These four sites were thus considered unclear. The Hecate Strait Glass Sponge Reef MPA RIAS notes that while oil and gas is considered to be prohibited under the general prohibition, should the oil and gas moratorium be lifted, the current prohibition may be reconsidered.

Figure 4. Oil and gas prohibition in MPAs concurrent with minimum protection standards by region and nationally. Percentages represent the proportion of the total area covered by MPAs.



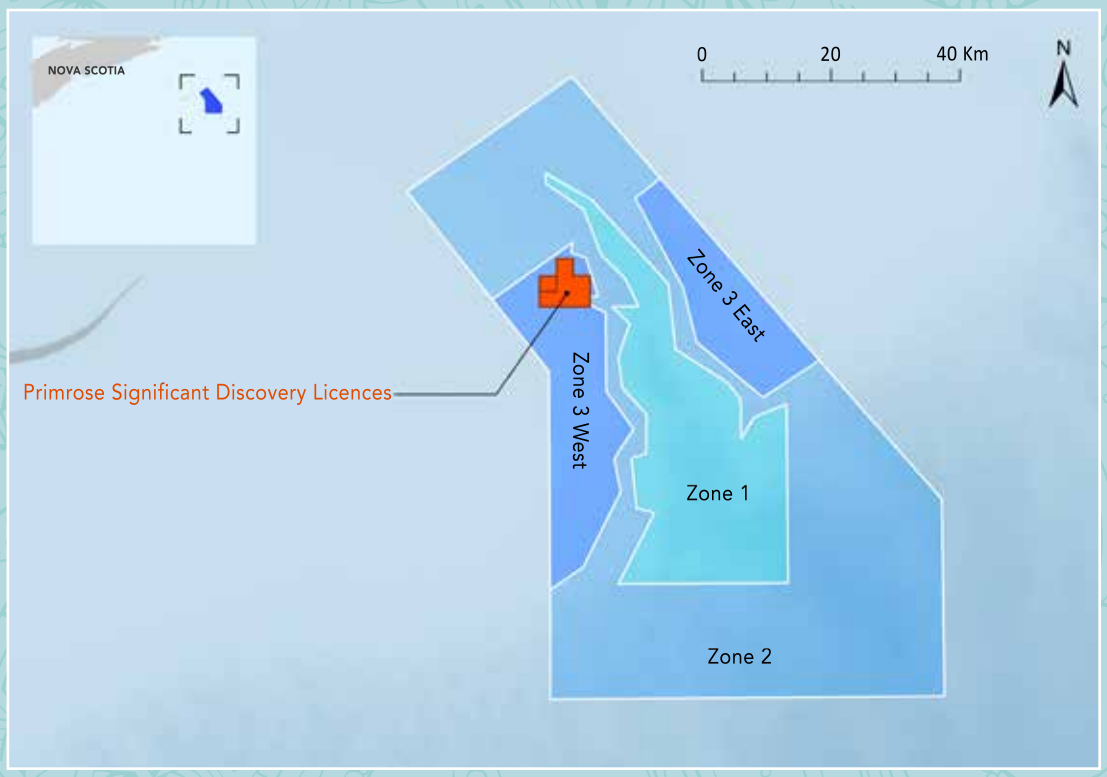


Figure 5. The Gully at-a-glance: MPA zoning and the Primrose N-50 Significant Discovery Licences for petroleum exploration, testing and drilling.

CASE STUDY: THE GULLY MPA

The Gully was the first MPA designated in Atlantic Canada. Located along the edge of the Scotian Shelf off Nova Scotia, The Gully contains important offshore ecosystems, including deep sea corals and critical habitat for the northern bottlenose whale.

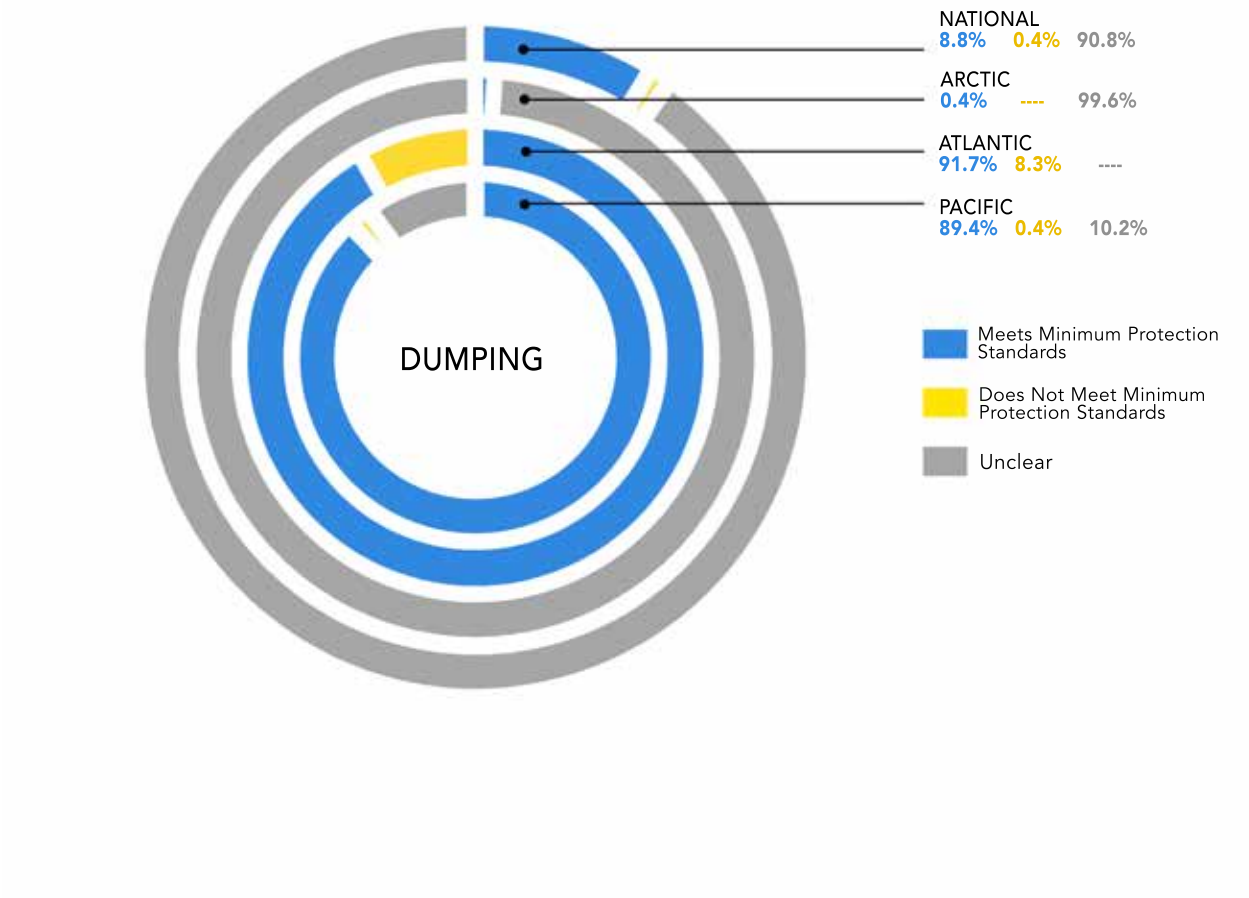
General prohibitions laid out in the regulations make it illegal for any person to disturb, damage, destroy or remove any living marine organism or any part of its habitat in the MPA. The regulations also prohibit depositing, discharge and dumping in the MPA and vicinity if negative impacts are likely.

Zone 1, comprising the deepest parts of the canyon, is a strict preservation zone. Zone 2 is a strict protection zone where commercial longline fisheries for sharks, tuna, halibut and swordfish are permitted.[45] Zone 3 encompasses the shallow banks on the sides of the canyon. Most activities are allowed in Zone 3, provided any associated disturbance, damage or destruction is within the normal variability of the ecosystem. Terms like “disturbance”, “vicinity” and “natural variation” are not clearly defined. There are two Significant Discovery Licenses to develop Primrose Field in Zone 3 West. The C-NSOPB has had a policy-based moratorium in place, but MPA regulations for The Gully do not rule out the possibility of oil and gas occurring in a portion of the MPA in the future.

Dumping and (non-fishing related) dredging

The dredging of a seabed — even in relatively small amounts — can contribute to pollution, erosion, and sedimentation of coastal wetlands, marshes, rocky shores and sand dunes, with impacts on important ecosystems such as eelgrass and sponge reefs. The dumping of any quantity of pollutants, including sewage, grey water, solid waste, scrubber effluent, ballast water, and oil in an MPA can also stand in direct conflict with a site's conservation objectives. Dumping may also come from upland and coastal sources including agricultural run-off, effluent, and debris from industries such as mining and forestry, biological and chemical waste from aquaculture operations, and untreated sewage from communities. Given the range of activities that may result in the dumping or discharging of substances and the various purposes of dredging, clear and comprehensive legal definitions are needed for both.

Figure 6. Dumping prohibition in MPAs concurrent with minimum protection standards by region and nationally. Percentages represent the proportion of the total area covered by MPAs.



Management

The NMCA Act prohibits exploring or exploiting aggregates or inorganic matter but this does not clearly address dredging for navigational purposes. The broad prohibition against damaging, disturbing or destroying organisms or habitat under the *Oceans Act* and *Canada Wildlife Act* Protected Marine Area Regulations should prohibit dredging, thus we reviewed the regulations and management plan for clear exemptions. Six MPAs provide exemptions for dredging activities for navigational purposes or include exemptions for the maintenance and construction of infrastructure that will likely involve dredging or dumping. Basin Head and Musquash Estuary allow for the construction and maintenance of docks, wharves, and boat ramps. Saguenay-St. Lawrence, Anguniaqvia niqiqyuam and Tarium Niryutait provide exemptions for navigational dredging. The Scott Islands regulations provides blanket exceptions for fisheries, navigation, and foreign vessels or aircraft.

Dumping is clearly prohibited in the NMCA Act and *Canada Wildlife Act* Protected Marine Area Regulations, though exceptions may be granted. Most older *Oceans Act* MPAs (except for the Endeavour Hydrothermal Vents) include a clause prohibiting "depositing, discharging or dumping any substance, or causing any substance to be deposited, discharged or dumped…that is likely to result in the disturbance, damage, destruction or removal of a living marine organism or any part of its habitat." However, this clause has been absent from the regulations for *Oceans Act* MPAs established since 2017. This includes the Laurentian Channel and Tuvaijuittuq, which were announced after the commitment to minimum protection standards. We understand this change assumes that the general prohibition against disturbing, damaging or destroying inherently prevents dumping, but this has not been clarified publicly. Additionally, as dumping is explicitly allowed or acknowledged in some MPAs, we feel that a dumping prohibition cannot be presumed.

Three MPAs either expressly allow, or fail to prohibit, some form of dumping within their respective boundaries. Endeavour Hydrothermal Vents makes no reference to dumping in the regulations but does acknowledge that dumping of waste and debris from research vessels and submarine experiments does occur within the MPA. The Gully allows for dumping in Zone 3 within the limits of "natural variation" (though the limits are not defined), and Saguenay-St. Lawrence acknowledges that solid and liquid waste is discharged within the MPA boundaries. Tarium Niryutait is the only Arctic site with a clear prohibition against dumping. It should also be noted that runoff and pollution from adjacent lands and infrastructure are identified as problems for Gilbert Bay, Musquash Estuary and Basin Head.

Anchoring and navigation

Neither the minimum protection standards nor *The MPA Guide* address shipping or navigation comprehensively, instead only dumping and anchoring (respectively) are considered. Noise and the risk of ship strikes pose significant danger and may be partially addressed in the assessment of non-extractive use in *The MPA Guide*. In the St. Lawrence Estuary, scientists have found that Belugas must increase the frequency of their calls to "shout" over background shipping noise.[46] Studies have also shown that vessel traffic disturbs seabirds and reduces their available habitat. In reducing foraging time and resting habitat for seabirds, commercial and recreational ship traffic can cause habitat fragmentation, resulting in higher stress levels and increased energy requirements.[47] Concerns have also been raised in communities surrounding Tallurutiup Imanga regarding ice breaking by vessels and the need to protect the floe edge and restrict anchoring locations.[48]

The size, weight, and type of the anchor or mooring, along with a crew's knowledge, skill, and the level of adherence to best practices, and the presence of sensitive ecosystems, all affect the amount of damage from anchoring. For example, anchors and chains can drag along the seafloor when being deployed or retrieved and when tides, currents or winds change. Anchoring can also produce sediment plumes from both anchor and propellor scouring in shallow water. The effects of anchoring and moorage on sensitive and features such as seagrass and corals can be devastating. Assessments for the scale of anchoring and potential impact were based on the location (offshore versus coastal, exposure versus shelter), limitations on vessels listed in the Notice to Mariners, and description of the benthic ecosystem.

Management

Most MPA regulations and management plans make no reference to anchoring and do not provide guidance.The Notice to Mariners communicates voluntary and regulatory measures, including the boundaries of MPAs and recommendations to avoid, as well as marine mammal regulations and prohibitions on discharges.

Six MPAs prohibited anchoring in one or more zones. Laurentian Channel, Basin Head, Musquash Estuary, Banc-des-Américains, and Gwaii Haanas all included prohibitions on anchoring and voluntary avoidance Notice to Mariners. Hecate Strait Glass Sponge Reefs also prohibited anchoring in the Core Protection Zone (CPZ), but not in the Adaptive Management Zone (AMZ). Given the depth of the reefs, their fragility and sensitivity to direct impact and sedimentation, and the proximity of the AMZ to the reefs in some places, we deemed this to be incompatible with the conservation objectives, thus making the entire AMZ incompatible. For most other MPAs anchoring was typically anticipated to have minimal to moderate impacts, resulting in a maximum potential protection score of highly or lightly, respectively.

Photo David Maginley

Infrastructure

Infrastructure is a very broad term and can include anything from an offshore oil rig to a mooring buoy. Infrastructure is often a cause or source of habitat degradation and pollution. Construction of infrastructure can physically damage, disturb and displace ecosystems and species and resuspend sediments. Presence of infrastructure is also associated with increased use of the area and marine traffic, creating a continued disturbance and risk of spill, dumping and other forms of accidental damage. On the other hand, the creation of coastal MPAs provides an opportunity to invest in upgrading and creating infrastructure, such as waste facilities and safe moorage, that will benefit communities and reduce the footprint of human activities on marine ecosystems. Coastal communities rely on marine infrastructure and so an outright prohibition of infrastructure is not feasible in most coastal MPAs but mitigation and management measures are still needed.

Management

The NMCA Act expressly prohibits the disposal and occupation of public lands, which would limit infrastructure to public services, although exceptions may be provided. Activities that may disturb, damage, destroy or remove marine species are prohibited per the *Oceans Act* and *Canada Wildlife Act*. Provincial governments also have a significant role in the development of coastal infrastructure as they have jurisdiction over the shoreline and seabed to various degrees. Infrastructure assessments were based on the type and scale of infrastructure described in the regulations or management plan as

existing or permitted, alongside information about the ecosystem that might suggest sensitivity. Infrastructure mentioned included wharves and boat launches, undersea cables and potential infrastructure associated with oil and gas activities.

Two MPAs permitted infrastructure on a scale and with potential impacts that would be incompatible with the conservation objectives. Tarium Niryutait allows for the potential development of infrastructure associated with future oil and gas operations in the Okeevik region. Hecate Strait Glass Sponge Reefs permits cable laying, maintenance, and repair in the AMZ provided it is not likely to result in the damage, destruction, or removal of the reef. As with anchoring, this presents an unacceptable risk to the reefs.

Five MPAs allowed for moderate to large infrastructure. The Scott Islands RIAS notes investigative licenses for wind power within the MPA and that future proposals would be subject to an environmental assessment but may be authorized through a permit under the regulations. Saguenay-St Lawrence, Musquash Estuary and Gilbert Bay all allow for the management and construction of wharves, docks and boat ramps. The Tuvaijuittuq Ministerial Order permits the laying, maintenance, and repair of cables and pipelines by a foreign state.

Photo Kelly Roebuck

Aquaculture

Marine aquaculture can be separated into two streams: fed aquaculture, which includes finfish such as Atlantic salmon, and unfed systems which include the cultivation of seaweed and shellfish such as mussels and oysters. Impact levels of aquaculture operations can vary depending upon the species being farmed, the location being used, and the harvesting technologies and techniques being applied. Restorative aquaculture is also a rapidly growing field, for example the restoration of Indigenous clam gardens, which has a net benefit both ecologically and socially. Jurisdiction over aquaculture activity is complicated, implicating provincial and federal agencies to various degrees across Canada. The Government of Canada is currently developing a federal Aquaculture Act which could potentially identify areas where aquaculture operations are not permitted. As aquaculture activities could range from ecological and cultural restoration projects to industrial scale aquaculture operations, clear guidance and explicit definitions are needed for most sites.

Management

Very few MPAs made explicit reference to the prohibition of aquaculture operations. The Eastport RIAS discloses potential for aquaculture in adjacent waters but notes it would be prohibited within the MPA itself. The Gwaii Haanas Gina 'WaadluXan KilGuhlGa Land-Sea-People Management Plan reports no existing aquaculture operations and the NMCA Act prohibits the disposal and/or occupation of public lands needed for commercial aquaculture operations in the site. In addition, the Council of the Haida Nation has requested that the provincial government uphold the ban on finfish aquaculture in northern British Columbia. There may be potential for low impact aquaculture for restoration or cultural purposes. For all other MPAs aquaculture activities were considered "unknown" as aquaculture is not explicitly addressed in most regulations or management plans. For offshore sites, the potential for aquaculture is low, however there is growing interest in offshore aquaculture operations that cannot be ignored. Given the diversity in aquaculture operations and potential effects, various other regulations such as prohibitions on anchoring, dumping, or vessel traffic might limit potential operations.

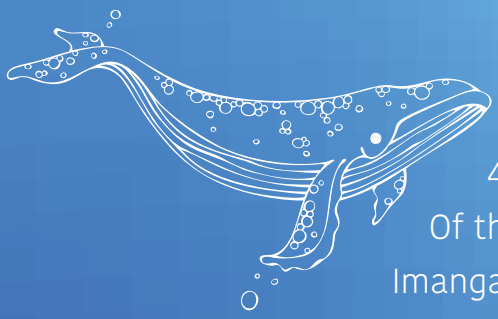
Recreation and non-extractive activities

Non-extractive activities include scientific studies, recreation and tourism, and environmental education. Most MPAs are intended to support non-extractive uses. For NMCAs and mNWAs the Minister may issue permits for some activities. For *Oceans Act* MPAs proponents are required to submit an Activity Application to the Minister for approval. However for many sites limited information was available on potential or approved activities. Musquash Estuary, Gwaii Haanas and Saguenay-St Lawrence all incorporate management measures for non extractive, recreational use including limiting vessel traffic in some zones.

It must be noted that scientific studies may include sampling and other extractive activities, including scientific bottom trawling as previously indicated, that can have significant effects on the local ecosystem. This is a gap in *The MPA Guide* scoring system, but also a gap in minimum protection standards. Also, while applications must be submitted, and permits provided for research and tourism activities, there is no publicly available database of permitted activities. Assessments were made based on regulations and local knowledge of current and potential activities. The scores for non-extractive activities did not have a significant impact on the overall score for the zone.

Photo TJamie Morrison

RESULTS



Together, the 18 sites we assessed cover almost 475,900 km^2, or 8.28% of Canada's ocean estate. Of these, two sites alone, Tuvaijuittuq and Tallurutiup Imanga, cover over 400,000 km^2.

How well-managed are Canada's MPAs

Of the 18 MPAs assessed, 16 have been officially designated. One site (Tallurutiup Imanga) is proposed, and one site (Tuvaijuittuq) has interim protection. As there are regulations in place, Tuvaijuittuq is included in the analysis but we caution that current interim protections lack the permanence expected of a MPA.

Of the sites that are officially designated, ten have been established for ten years or longer. The rest were designated within the past four years, though most were proposed several years before that. It often takes multiple years for an Area of Interest to be formally identified and officially proposed. To date, Canadian MPAs have taken an average of just over seven years to progress from "proposed" to "designated," and another four years for development of a management plan.

Photo Nick Hawkins

Table 1. Stage of Establishment and management plan status

MPA name	Fed agency	Date est.	Stage of Establishment	Management plan publication
Anguniaqvia niqiqyuam	DFO	2016	Designated	Under development
Banc-des-Américains	DFO	2019	Designated	Under development
Basin Head	DFO	2005	Actively Managed	2016
Eastport	DFO	2005	Actively Managed	2013
Endeavour Hydrothermal Vents	DFO	2003	Implemented	2010
Gilbert Bay	DFO	2005	Actively Managed	2013
Gwaii Haanas	PCA	2010	Actively Managed	2018
Hecate Strait Glass Sponge Reefs	DFO	2017	Actively Managed	Under development
Laurentian Channel	DFO	2019	Designated	Under development
Musquash Estuary	DFO	2006	Actively Managed	2017
Saguenay-St. Lawrence	PCA	1998	Actively Managed	2016 (2010)**
Scott Islands	ECCC	2018	Designated	Under development
SG̲aan K̲inghlas-Bowie Seamount	DFO	2008	Actively Managed	2019
St. Anns Bank	DFO	2017	Designated	Under development
Tallurutiup Imanga	PCA	-	Proposed/Committed	-
Tarium Niryutait	DFO	2010	Actively Managed	2013
The Gully	DFO	2004	Actively Managed	2017
Tuvaijuittuq	DFO	-	Interim (Designated)	-

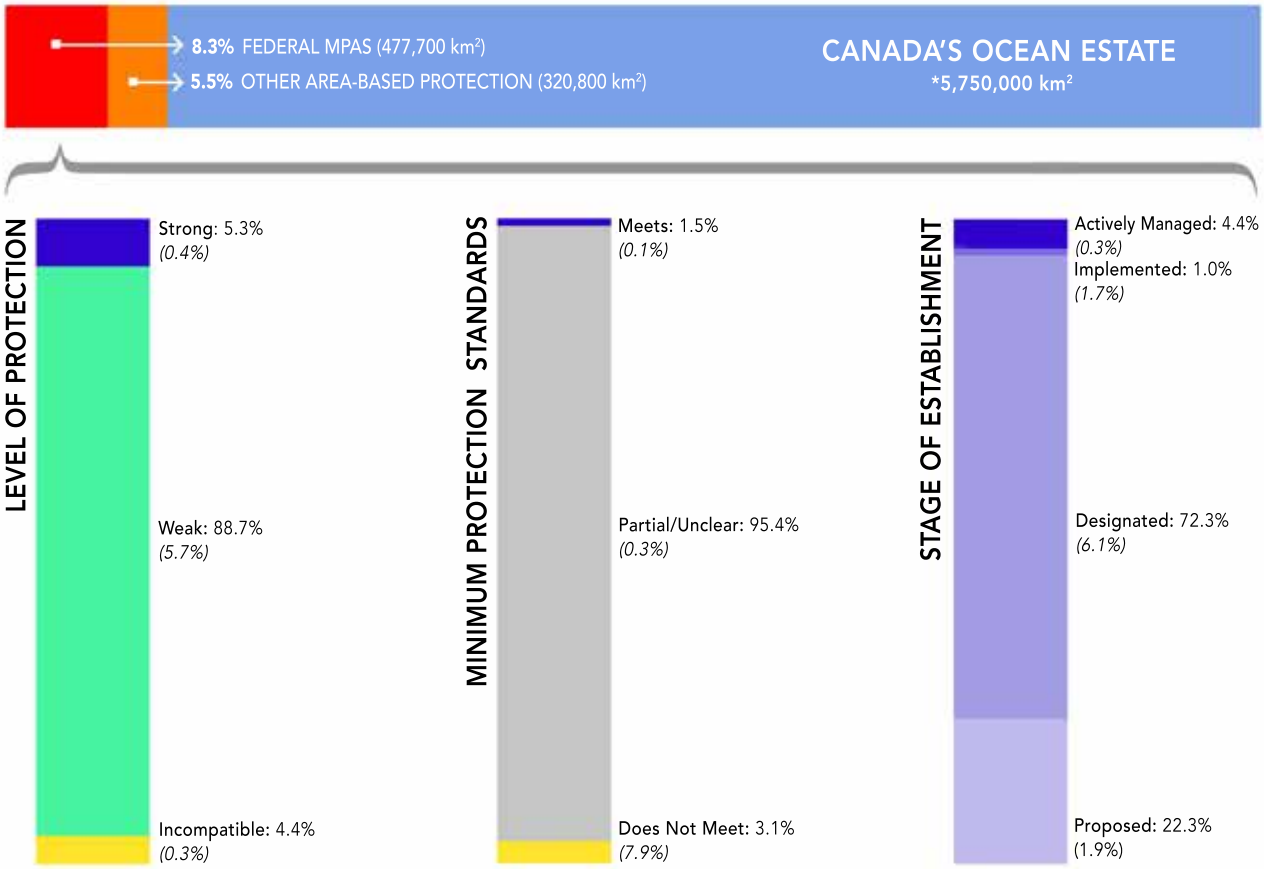
* DFO= Fisheries and Oceans Canada, ECCC= Environment and Climate Change Canada, PCA= Parks Canada Agency

** Current Saguenay-St Lawrence Marine Plan was first published in 2010. It was reviewed in 2016 and no changes were made.

Table 2. Federal MPAs being counted towards Canada's marine protection targets

Region	National	Arctic	Atlantic	Pacific
Ocean estate (km^2)	5,750,000	3,240,909	384,322	351,060
Number of federal MPAs	18	4	9	5
Approximate MPA coverage (km^2)	457,900	431,590	20,616	23,665

Figure 7. Level of Protection, compliance with minimum protection standards, and Stage of Establishment (% Canada's ocean estate)*



Ten MPAs were considered "Actively Managed" as there are management and monitoring plans, records of monitoring, or enforcement activities in place. This includes Hecate Strait Glass Sponge Reefs which does not currently have a management plan but is being actively enforced.[49] Information on site-specific resource allocation was not included in the management plans so we cannot determine with precision if current management and monitoring efforts are adequate. Despite being one of the oldest MPAs, we determined that Endeavour Hydrothermal Vents is "Implemented" not "Actively Managed." The current management plan expired in 2015 and there is no documentation of monitoring or enforcement activities, even though the primary activity at this site is scientific research. This was not the only MPA with an expired or outdated management plan: Eastport, Gilbert Bay, and Tarium Niryutait management plans were due for renewal in 2018; Basin Head's management plan was last revised in 2016; and the Saguenay-St Lawrence management plan has not changed since 2010.

* In total, 13.8% of Canada's ocean estate is protected. Federal MPAs account for 8.3% and other area-based protection covers 5.3% of Canada's oceans. The bar charts provide a percentage breakdown of the state of federal MPAs only. Total ocean estate area has been rounded to the nearest 1000 km².

How well-protected are Canada's MPAs

None of Canada's MPAs explicitly addresses all of the minimum protection standards within the MPA regulations alone.

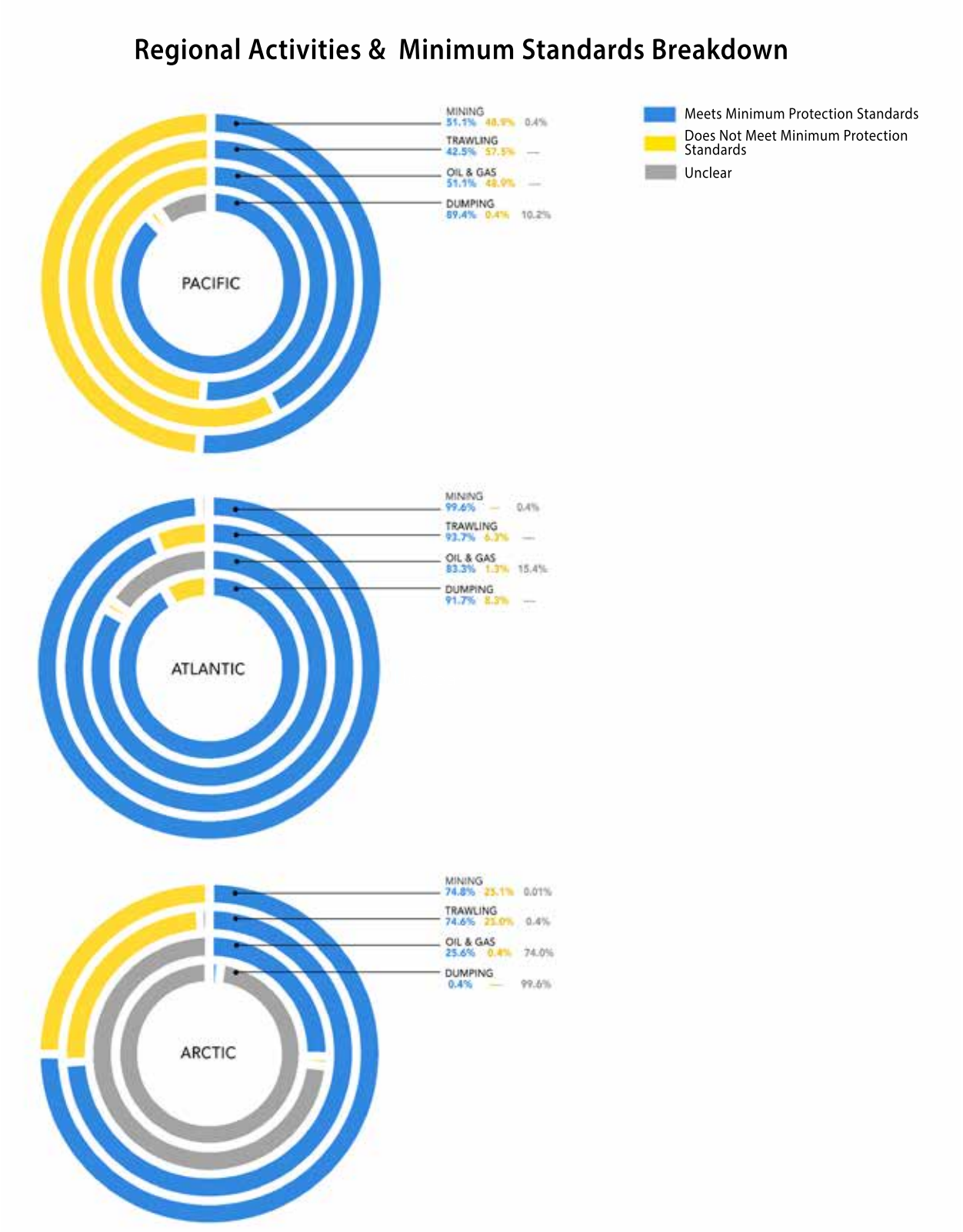
According to our analysis, Eastport, Banc-des-Américains and SGaan Kinghlas-Bowie Seamount meet all four minimum protection standards in practice, though all three sites, which together cover 0.1 % of Canada's ocean estate, would benefit from additional clarifications in the MPA regulations and/or management plans. Four MPAs, covering 0.3 % of Canada's ocean estate, have clear contraventions to the minimum protection standards throughout the MPA. The remaining 11 MPAs, covering 7.9 pf Canada's ocean estate, contained one or more zones that did not meet the standards, or the regulations were ambiguous.

Table 3. Summary of minimum protection standards

	Meets min. standards			Does not meet min. standards			Partial / Unclear		
	# sites	% area in MPAs	% ocean estate	# sites	% area in MPAs	% ocean estate	# sites	% area in MPAs	% ocean estate
National	**3**	**1.5**	**0.1**	**4**	**3.1**	**0.3**	**11**	**95.4**	**7.9**
Arctic	-	-	-	1	0.4	<0.1	3	90.3	7.5
Atlantic	2	0.2	<0.1	1	0.3	<0.1	6	3.9	0.3
Pacific	1	1.3	0.1	2	2.5	0.2	2	1.2	0.1

It should be noted that these statistics are significantly skewed by Tuvaijuittuq Interim MPA and Tallurutiup Imanga because of their large size. However, both sites lack permanent protection. It is unclear if Tuvaijuittuq meets the minimum protection standards as current prohibitions are temporary, and dumping is not explicitly addressed in the interim MPA order, though shipping activity, which would be the main source of dumping, is negligible.[50] Tallurutiup Imanga is also unclear as there are currently no regulations or prohibitions in place. Mining and oil and gas are not currently occurring and designation as an NMCA would formally prohibit both activities from the area. Bottom trawling is not currently happening but there may be future interest and so a clear prohibition will be needed. Dumping may currently be occurring at moderate to high levels[51] but would presumably be prohibited without a permit under the NMCA Act.

Figure 8. Mining, trawling, oil and gas, and dumping activities by region and nationally. Percentages represent the proportion of the total area covered by MPAs.



Using our adaptation of the Regulation-Based Classification System MPA index (see **Methods**), of the 17 MPAs we assessed (Appendix A), two sites are Fully protected, six are Highly protected, seven are Lightly protected, one is Minimally protected and two are Incompatible with biodiversity conservation. This includes Tuvaijuittuq as there are prohibitions in place, but not Tallurutiup Imanga, which has not yet been designated. Tuvaijuittuq was scored as lightly protected since the regulations allow for the laying of pipes and cables by foreign states. However, it must be noted that this is not permanent protection. In 2024 Tuvaijuittuq must be legally designated or otherwise de-listed. Furthermore, when (or if) Tuvaijuittuq is fully designated, the management measures and prohibitions may be stronger or weaker than the interim order.

TALLURUTIUP IMANGA – PROTECTING THE ARCTIC

The federal government and the Inuit of Qikiqtani region have signed an Inuit Impact and Benefit Agreement that will allow for the establishment of Tallurutiup Imanga NMCA in the Arctic. The site currently counts towards Canada's marine conservation targets. It is considered 'proposed/committed' under *The MPA Guide's* classifications and lacks any regulations.

Although there are no regulations in place, we did evaluate Tallurutiup Imanga based on current activities and the NMCA Act regulations to determine an anticipated protection level. Given that the NMCA Act prohibits oil and gas activities, mining, dumping (without a permit) and occupying or dispossessing public lands, and that current fishing activity and non-extractive uses are minimal the MPA could be highly or fully protected. The NMCA Act requires at least one zone that is fully protected but there is no requirement regarding the relative size of the zone.

Activities not addressed by the general prohibitions of the NMCA Act include shipping and fishing. Given the government commitment to minimum protection standards in all new federal MPAs, it is anticipated that bottom trawling and dumping will be explicitly prohibited. The site is a relatively busy route for vessel traffic in the Arctic. As such dumping and anchoring from vessels may be significant.[4]

Current fishing activities are limited, there is no bottom trawling presently occurring, but there will likely be interest in new fisheries as ice cover diminishes and existing fisheries potentially shift north. To prevent future harm and degradation of a relatively pristine ecosystem, these activities will need to be managed through specific MPA regulations.

As the sites examined range in size from 2 km^2 to 320,000 km^2, we also assessed spatial coverage. Looking at individual zones rather than the combined MPA scores (excluding Tallurutiup Imanga), of the 368,000 km^2 of federal MPAs we evaluated 6.9 % is fully or highly protected, 88.7 % is lightly or minimally protected, and 4.4 % is incompatible with conservation.

In terms of Canada's ocean estate, this contributes 0.4 % in Fully or Highly protected MPAs, 5.7 % in Lightly or Minimally protected MPAs and 0.3 % is in MPAs that are Incompatible with the conservation objectives. Again, it must be noted that these figures comprise only a subset of the sites Canada is counting towards its marine conservation targets. A significant number of sites, covering a total area almost as large, are designated under other tools and have yet to be evaluated.

Table 4. Level of Protection by zone scores shown as percentage of total federal MPA coverage (percentage of Canada's ocean estate shown in parentheses)

	Strong Protection		Weak protection		No protection
	% Fully protected	% Highly protected	% Lightly protected	% Minimally protected	% Incompatible
National	**3.0 (0.2)**	**3.6 (0.2)**	**88.4 (5.7)**	**0.5 (>0.0)**	**4.4 (0.3)**
Arctic	-	-	87.9 (5.6)	-	0.1 (>0.0)
Atlantic	0.6 (>0.0)	3.6 (0.02)	0.5 (>0.0)	0.5 (>0.0)	0.4 (>0.0)
Pacific	2.5 (0.2)	-	-	<0.1 (>0.0)	4.0 (0.3)

Breaking these numbers down by coast, it is quickly apparent that Tuvaijuittuq (lightly protected) strongly skews these results (Table 5). To further simplify our results and group similar anticipated benefits, we combined fully and highly protected and lightly

Photo Bethany Legg

and minimally protected into strongly and weakly protected categories, respectively. In the Atlantic region and Gulf of St. Lawrence, almost 80 % of the area assessed is strongly protected, 14 % is weakly protected and 6 % is incompatible. In the Pacific region, however, 38 % of the area we evaluated is strongly protected, 0.4 % is weakly protected and over 61 % is incompatible with biodiversity conservation. The latter is largely due to the Scott Islands, which accounts for almost 50 % of MPA coverage in the Pacific.

Finally, it must be noted that these scores are based on current prohibitions and management measures and consider management measures that are external to the MPA regulations. As identified in the minimum standards review, several MPAs have the potential for future oil and gas activities or bottom trawling to occur if moratoria or fishing closures are overturned. In total, five MPAs could be "downgraded" if this were to occur. This is in addition to both Tuvaijuittuq and Tallurutiup Imanga, which have yet to be officially designated. Bottom trawling is not prohibited in the Endeavour Hydrothermal Vents MPA but is highly unlikely given the location and depth.

If the Minimum Protection Standards were implemented in all of the MPAs we assessed, nine MPAs would be strongly protected, eight would be weakly protected and none would be incompatible. In particular, the Scott Islands and Saguenay St Lawrence would both move from incompatible to weak protection, and Gwaii Haanas and Musquash Estuary would move from weak to strong protection.

Table 5. Potential for future activities in MPAs that would contravene the minimum protection standards

MPA	Potential Threats
The Gully	Policy prohibitions on oil and gas are temporary and can be altered or discontinued, leaving a gap in full protection. Furthermore, trawling is not occurring but may be allowed in Zone 3 if impacts are within natural variation.
Basin Head	MPA regulations allow for bottom trawling in Zone 3, though currently prohibited through an overlapping OECM designation.
Hecate Strait and Queen Charlotte Sound Glass Sponge Reefs	Oil and gas activities are currently prohibited by federal and provincial moratoria. The MPA RIAS states "That decision could be revisited should regulatory regimes be established for these activities in the future."
SGaan Kinghlas-Bowie Seamount	British Columbia has federal and provincial policy-based moratoria against oil and gas in place, but a lease in the MPA exists. A resolution by Council of Haida Nation has been passed.
Tarium Niryutait	Oil and gas activities are exempt from prohibitions per the MPA regulations; a moratorium is in place although subject to review every five years (the first review is at the end 2021). All fishing activities are permitted in the MPA. Currently no bottom trawling occurs.
Endeavour Hydrothermal Vents MPA	All commercial fishing activity is allowed; given depth and location, bottom and even midwater trawling are highly unlikely.

Table 6. Federal MPA scores

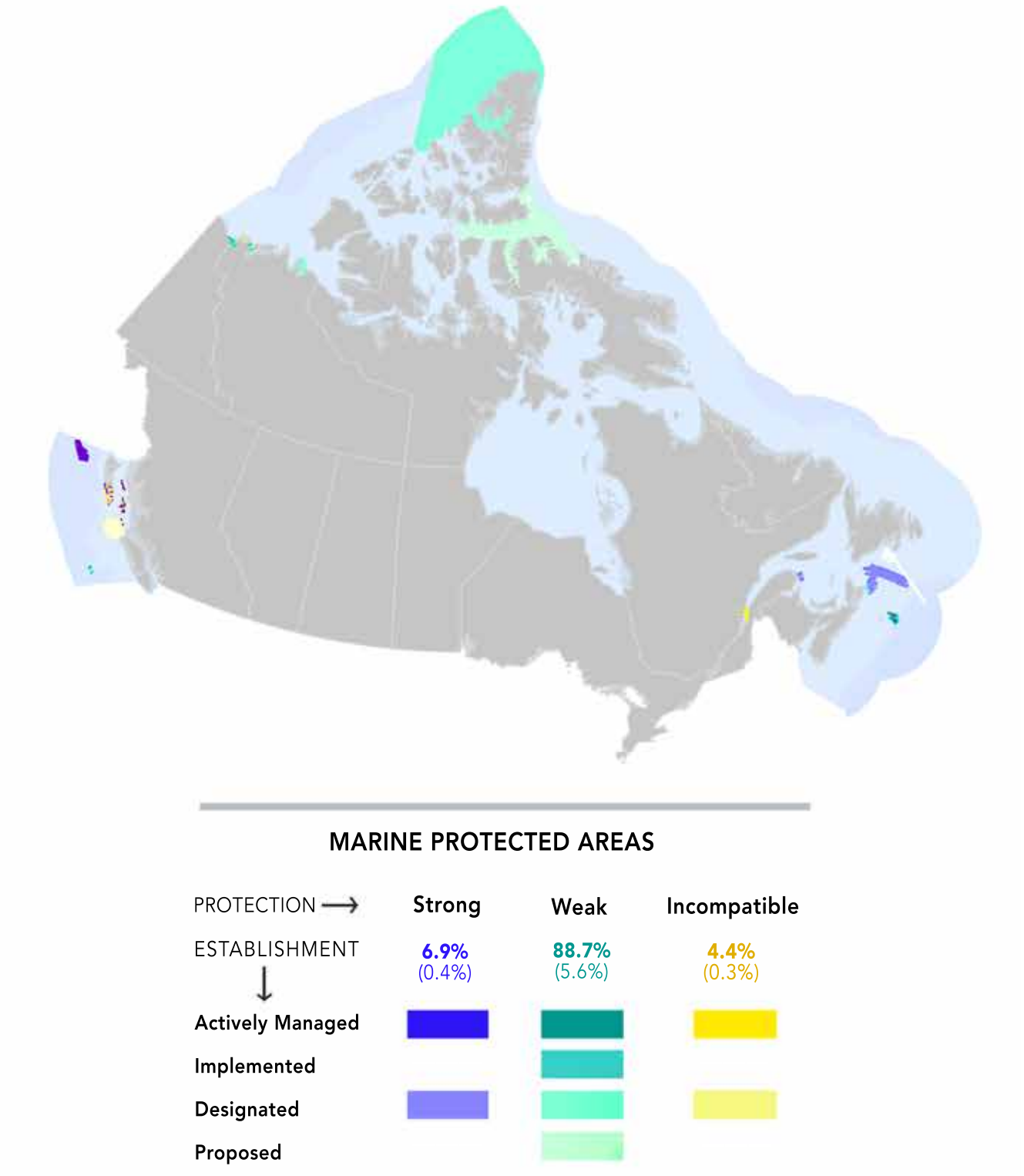
Site	Zones	Size (km²)	Level of Protection by zone	Level of Protection by site (index score)	Allowed/ Exempt activities
Eastport		2.1	Highly	Highly (2)	Moderate fishing activity
Gilbert Bay	Zone 1a	12.88	Lightly	Lightly (3.6)	No regulation of anchoring
	Zone 1b	12.03	Lightly		No regulation of anchoring
	Zone 2	17.87	Incompatible		Trawling, anchoring, infrastructure
	Zone 3	19.62	Incompatible		Trawling, anchoring, infrastructure
Laurentian Channel	Zone 1a	1,495.00	Fully	Fully (1.7)	
	Zone 1b	611.47	Fully		
	Zone 2a	4,039.89	Highly		Anchoring, small scale infrastructure
	Zone 2b	5,414.92	Highly		Anchoring, small scale infrastructure
St. Anns Bank	Zone 1	3,309.13	Highly	Highly (2.1)	Anchoring
	Zone 2	719.76	Lightly		Moderate fishing activity, anchoring
	Zone 3	113.26	Lightly		Moderate fishing activity, anchoring
	Zone 4	221.63	Lightly		Moderate fishing activity, anchoring
The Gully	Zone 1	475.45	Fully	Lightly (3.4)	Anchoring
	Zone 2	1,431.69	Minimally		High impact fishing activity
	Zone 3E	181.69	Minimally		Dumping, high impact fishing activity
	Zone 3W	275.10	Minimally		Oil & gas*, dumping, high impact fishing
Basin Head	Zone 1	0.24	Highly	Highly (2.9)	Low impact fishing
	Zone 2	0.35	Highly		Small scale infrastructure, low impact fishing
	Zone 3	8.65	Lightly		Anchoring, infrastructure, low impact fishing
Musquash Estuary	Zone 1	1.54	Highly	Lightly (3)	Low impact fishing
	Zone 2a	4.67	Lightly		Dredging, infrastructure, anchoring, fishing
	Zone 2b	0.27	Lightly		Infrastructure, moderate fishing
	Zone 3	0.95	Incompatible		Trawling
Banc-des-Américains	Zone 1	126.47	Fully	Highly (2.6)	
	Zone 2a	570.24	Lightly		Moderate fishing activity
	Zone 2b	303.05	Lightly		Moderate fishing activity
Saguenay-St Lawrence	Zone 1	34	Incompatible	Incompatible	Trawling and dumping, not zoned
	General	1212	Incompatible		

Site	Zones	Size (km²)	Level of Protection by zone	Level of Protection by site (index score)	Allowed/ Exempt activities
Gwaii Haanas	Restricted Access	0.11	Fully	Lightly (3.4)	
	Strict Protection	1,428.18	Fully		
	Multiple Use	2,055.09	Incompatible		Trawling
Hecate Strait Glass Sponge Reefs	CPZ	1,502.37	Fully	Highly (2.5)	
	AMZ/VAMZ	907.57	Incompatible		Anchoring permitted
Scott Islands		11,565.33	Incompatible	Incompatible	Trawling, oil & gas*, mining*, not zoned
SGaan Kinghlas-Bowie Seamount		6,109.96	Fully	Fully (1)	
Endeavour Hydrothermal Vents		97.07	Minimally	Minimally (4)	Dumping
Tarium Niryutait	Kitigaryuit	464.46	Lightly	Lightly (3.3)	Dredging
	Niaqunnaq	1,035.48	Lightly		Dredging
	Okeevik	243.02	Incompatible		Oil & gas exemption*, dredging
Anguniaqvia niqiqyuam	Zone 1	2,315.56	Lightly	Lightly (3)	dredging, moderate anchoring, low impact fishing
	Zone 2	38.46	Lightly		
Tuvaijuittuq		319,411.3	Lightly	Lightly (3)	Cables and pipelines by foreign states

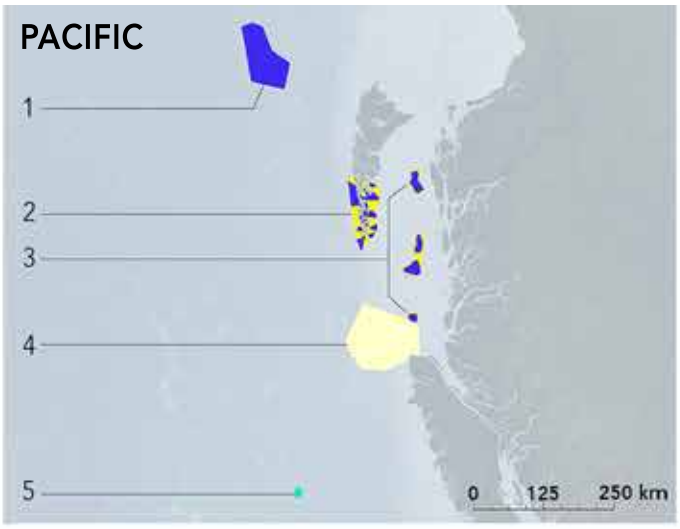
*Hydrocarbon and mineral exploration are currently prohibited through moratoria, but the regulations explicitly allow for future activities if current restrictions are lifted.

Photo Geaorge Karelitsky

Figure 9. Overview of Canada's federal MPAs by Stage of Establishment and Level of Protection. Pie charts and percentages represent the approximate area of 17 federal MPAs.



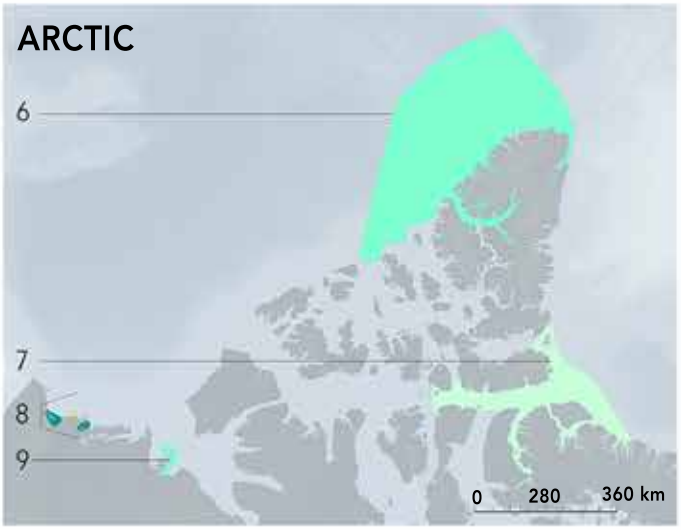
*Per cent of Canada's ocean estate shown in parentheses



PACIFIC

1 SGaan Kinghlas-Bowie Seamount MPA
2 Gwaii Haanas NMCAR
3 Hecate Strait Glass Sponge Reef MPA
4 Scott Islands mNWA
5 Endeavour Hydrothermal Vent MPA

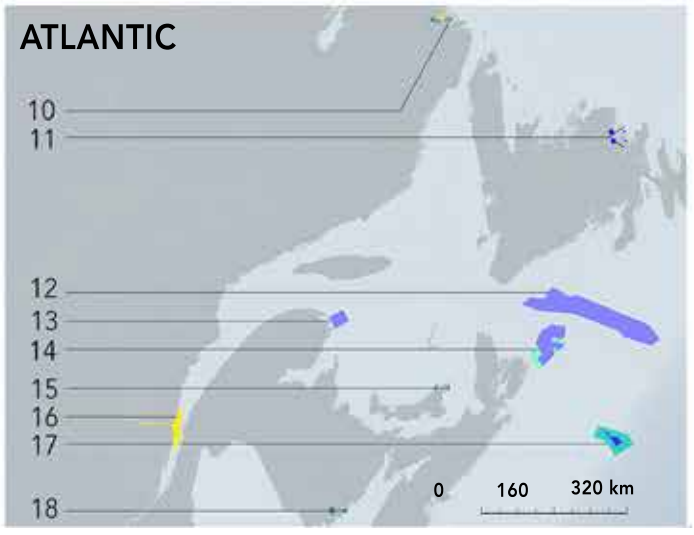
38% 0.4% 61%



ARCTIC

6 Tuvaijuittuq Interim MPA
7 Tallurutiup Imanga NMCA (proposed)
8 Tarium Niryutait MPA
9 Anguniaqvia niqiqyuam MPA

94% 6%

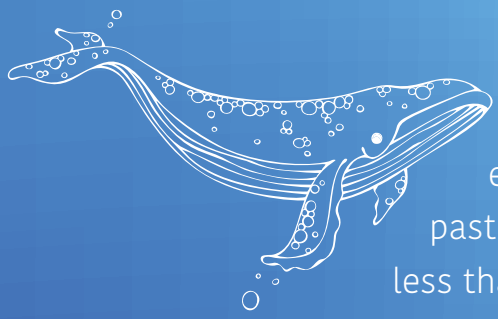


ATLANTIC

10 Gilbert Bay MPA
11 Eastport MPA
12 Laurentian Channel MPA
13 Banc-des-Américains MPA
14 St Anns Bank MPA
15 Basin Head MPA
16 Saguenay-St Lawrence Marine Park
17 The Gully MPA
18 Musquash Estuary MPA

80% 14% 6%

RECOMMENDATIONS



Canada has made considerable progress on the establishment and management of MPAs over the past five years; increasing the area protected from less than 1% to over 8% in federal MPAs, and 14% when OECMs and other designations are included. Canada has also committed to establishing minimum protection standards for MPAs and, more recently, to redoubling efforts and increasing protection to 25% by 2025 and 30% by 2030. This is what science tells us is the minimum needed to recover biodiversity, support sustainable fisheries, and sequester carbon; some studies suggest we may need to protect as much as 50% or more.[1] [2] Effectively protecting ***at least*** 30% will help to support coastal communities, help ecosystems adapt to climate change, and produce myriad other benefits, including creating sustainable and meaningful jobs. But to produce these benefits, MPAs must be strongly protected and well-managed.

The 18 sites examined represent about half the total area being counted towards marine conservation targets, and thus our results **cannot** be extrapolated to Canada's entire national marine conservation network. However, the sites assessed in this study can be reasonably expected to be at the higher end of the scale in terms of protection standards, as they are designated under the most comprehensive legal tools and are designed with conservation as a priority.

Designation, implementation and management

Most of Canada's MPAs are designated, implemented, or actively managed. However two sites counting towards Canada's marine protection targets currently lack full legal protection: Tuvaijuittuq Interim MPA and Tallurutiup Imanga proposed NMCA. Tallurutiup Imanga, as a proposed site, currently has no regulations in place and Tuvaijuittuq was designated by Ministerial Order as Canada's first Interim MPA, freezing the footprint of existing activities for five years while the site is considered for legal protection. While freezing the footprint of activities in interim MPAs can provide some protection in places with limited use, such as Tuvaijuittuq, and may provide protection from potential new uses, it will not address existing threats. Overfishing prior to the establishment of MPAs[52] is of particular concern where interim or proposed MPAs signal future restrictions but allow existing activities to continue. Further measures will be needed to manage exploitation of these types of sites while they have intermediary status. Moreover, counting proposed sites towards Canada's marine conservation targets implies that there is a degree of protection in place and that these sites will produce benefits, which is not necessarily the case. In the intervening time from proposal to designation, and designation to implementation, further harm may be incurred if damaging activities are not addressed.

Photo Sonia Nadales

Of the MPAs that are designated, most have management plans in place and evidence of monitoring or enforcement. However, it typically takes several years to develop a management plan after designation and six sites had management plans that were due or overdue for renewal. The gap between designation and implementation of the management plan is a concern, especially where there are ambiguities or a lack of detail in the regulations that may impede compliance and enforcement**.**

Management plans also vary in the structure, content and level of detail presented, but good examples of information presentation and availability include:

- Clear tables showing acceptable activities by zone(s) (e.g., Musquash Estuary, Saguenay-St. Lawrence),
- Tables of all relevant authorities (e.g., Musquash Estuary, Endeavour Hydrothermal Vents), and acceptable activity guidelines (e.g., The Gully),
- Lists of approved activities (e.g., Basin Head),
- Results of monitoring efforts (e.g., Gilbert Bay), and
- A clear reflection of co-governance with Indigenous Peoples (e.g., Gwaii Haanas, SGaan-Kinghlas Bowie Seamount).

Management plans typically did not include much in the way of spatial data regarding ecological features, human use and infrastructure, or management considerations. While recognizing that management plans reflect the unique local context of each MPA, *The MPA Guide* provides a potential standardized framework for management plans that would help to ensure every category of activity is addressed and that no gaps exist.

Photo Michael Li

SAGUENAY-ST. LAWRENCE MARINE PARK MANAGEMENT PLAN

In addition to being one of the first MPAs in Canada, the Saguenay-St. Lawrence Marine Park has arguably one of the most comprehensive and detailed management plans. The Marine Park's website also clearly presents all relevant and historical documentation.

While the MPA zoning has not yet been implemented and the regulations do not yet address several harmful activities, the management plan establishes a strong conservation vision for the Marine Park and clearly identifies activities that are not in compliance and will be eventually banned. The management plan has been reviewed twice, however no updates have been made since 2010. We recommend that future iterations include clear timelines and action plans for implementation of the zoning plan and improved protections.

In most cases there are other management measures beyond the MPA regulations that contribute to the management and effectiveness of an MPA. In some instances, these provisions are policy-based and lack the permanence expected of MPA designation. Even where complementary protections are enshrined in other legislation, that legislation may be amended in a way that removes or reduces protection for an MPA. For example, the Gilbert Bay management plan defers to the *Fisheries Act* to address risks to habitat from infrastructure projects. However, in 2012 many of the protections for fish habitat were removed from the *Fisheries Act*. These measures have since been restored, but it flags the importance of ensuring that MPA regulations and management plan provide sufficient clarity of intent and management guidance.

1. Interim MPAs should be established with caution in areas where existing activities are impacting the ecosystem as freezing the footprint will not fully address existing threats. Additional protection measures will be required.

2. An interim management plan that clarifies ambiguities in the regulations and management of the site should be published for all MPAs, including interim MPAs, and marine National Wildlife Areas, upon designation.

3. Where an MPA relies on protections provided by other jurisdictions or mechanisms, for example habitat protections or fisheries management measures under the *Fisheries Act*, the anticipated protections or prohibitions should be clearly reiterated in the MPA management plan as management directions.

4. MPA management plans should be comprehensive documents that include all relevant information for the MPA, including spatial data on ecological values, human use, and management considerations; budget and staffing expenditures; enforcement and monitoring efforts; all relevant authorities and jurisdictions; and approved activities to-date.

5. MPA regulations and management plans should "future proof" sites by identifying and providing guidance on emerging threats, potential new uses, and areas of growth.

Management of activities

Fishing and trawling

Bottom trawling is permitted within portions of five MPAs driving down the score for the whole site. In more than one case, local knowledge indicates that the actual area currently trawled is smaller than the zone within which it is permitted. This is an issue for all fishing activities. MPA regulations typically state what gear types can be used, but do not specify any further limitations or management measures on those gear types, thus leaving open the possibility of increasing levels of extraction. The most effective MPAs are highly or fully protected with limited extraction. At the very least MPAs should ensure that fisheries occurring within MPAs are consistent with the conservation objectives managed at ecologically sustainable levels and in line with international best practices for bycatch reduction and monitoring.

6 **Bottom trawling, including scientific trawling, should be prohibited in all MPAs. Any MPAs or zones in which bottom trawling is allowed should not be counted towards Canada's marine conservation targets.**

7 **Where commercial and recreational fishing activities are permitted within MPAs, the MPA should include measures to manage and prevent future increases in fishing activity and reduce impacts. All fishing must be compatible with the conservation objectives of the MPA and managed according to international best practices, including intensive monitoring and effective bycatch mitigation.**

8 **Vertical zoning should be avoided at all costs in accordance with IUCN guidelines. It is challenging to enforce, does not respect benthic-pelagic connections and increases overall traffic within the MPA.**

Oil and gas activities and mining

Oil and gas activities are prohibited in most MPAs except for The Gully, Scott Islands, and Tarium Niryutait, which all recognize existing licenses and potentially allow for future activities. Three other sites (Hecate Strait Glass Sponge Reef, Gilbert Bay and Musquash Estuary) specifically state that the regulations do not permanently foreclose on oil and gas opportunities. Two sites (Eastport and Basin Head) make no reference to oil and gas activites. *Oceans Act* MPAs do not explicitly prohibit oil and gas activities and thus rely on policy moratoria for prohibitions which leaves a worrying gap in protections should those moratoria be overturned. The primary reason for the lack of clear prohibition is that the costs of revoking licenses could be significant and that the management of offshore oil and gas activities is complex, especially in Atlantic Canada. However, an offshore oil and gas boom in Canada looks increasingly unlikely given the increasing volatility and general downwards trend in the oil and gas markets, the policy moratoria in place, and the global push to address the climate crisis. The federal and provincial moratoria in BC have been in place since the 1970s and having weathered previous attempts to overturn them, are likely in place for the long term. In several cases, oil and gas leases within MPAs have been relinquished voluntarily which is a win-win-win: oil and gas companies can demonstrate their stated commitments to a transition to renewable energies, the Government of Canada can meet its marine conservation and climate targets, and marine ecosystems get the long-term protection they need.

Photo Elyse Turton

Photo Vivek Kumar

Deep-sea mining is not yet happening in Canada, and no other mining activities are currently taking place in any of the assessed MPAs. However, there is likely to be future interest. Given the significant impacts it is assumed that any mining activity would contravene the MPA regulations. There is a push by conservation groups and a few significant business leaders for a global moratorium on deep-sea mining until the risks are understood and can be fully mitigated.[32]

9 **Oil and gas activities and all forms of mining should be explicitly and permanently prohibited in MPAs. Any MPAs with oil and gas activities, mineral, or aggregate mining in any part of the MPA should not be counted towards the marine conservation targets due to the significant and far-reaching impacts on marine ecosystems.**

10 **The federal government should proactively work with Offshore Petroleum Boards and industry to relinquish licenses voluntarily.**

Dredging and dumping

Several MPAs failed to clearly meet the minimum protection standards, in part because of a lack of clarity around dumping prohibitions. There is a broad range of activities which may result in dumping and no clear, legal definition. A recent report on pollution from cruise ships found that Canada's regulations are lagging those in neighbouring USA waters[53]. In the USA, No Discharge Zones have been established to address dumping, one of which covers all Californian marine waters.[54] In Canada, Voluntary Avoidance Areas have also been established for a few MPAs and could be used more widely to minimize vessel traffic and reduce the risk of dumping or spills. MPA designation is also an opportunity to address run off from upland areas and spills from coastal infrastructure.

We recognize that dredging for navigational purposes may be necessary in coastal MPAs where boats are a primary form of transportation, but the lack of mitigation directions in most management plans is a concern. As mentioned previously, relying on other tools such as the *Fisheries Act* habitat protections can be problematic as changes to policy or laws may inadvertently lessen protection for the MPA.

11 **Canada needs a clear and comprehensive definition of dumping that is consistently recognized in MPA regulations. Future *Oceans Act* MPAs should reinstate the prohibition against "... depositing, discharging or dumping any substance, or causing any substance to be deposited, discharged or dumped..." for clarity.**

12 **All potential sources of pollution — both marine and upland — should be identified and long-term management objectives should be set to work with relevant authorities to proactively address these risks. These include effluent from upland mines, forestry operations and other industrial uses, sewage, agricultural run-off, as well as light and noise pollution.**

13 **MPA management plans should identify and map areas requiring dredging, along with any ecological features that may be impacted, and establish mitigation requirements.**

Anchoring and navigation

Only a few MPAs have zones that prohibit anchoring or actively manage vessel access, even though most MPAs include potentially sensitive benthic ecosystems.[55] Reducing anchoring and vessel traffic would strengthen protection of most sites and increasing attention is being paid to the impacts of shipping. Studies of vessel traffic have been undertaken for SGaan Kinghlas-Bowie Seamount to inform management decisions and reduce the risk of collisions and spills,[56] the Scott Islands was chosen as a pilot study area for proactive vessel management systems,[57] and a review of anchoring within St. Anns Bank MPA was proposed early in the planning phase[58] although no regulation of anchoring was put in place.

14 **The impacts of anchoring and vessel use should be carefully considered in MPA design and management plan development. Shipping and vessel use must be consistent with the conservation objectives of the MPA and subject to detailed review during MPA planning.**

15 **Anchoring should be prohibited in sensitive ecosystems within MPAs.[59] Voluntary restrictions on anchoring and voluntary avoidance areas for all navigation should be used to provide quick, temporary protection where needed. For coastal MPAs, mooring facilities should be provided to avoid anchoring in sensitive areas.**

Photo Manfred Krauter

ANCHORING AND SENSITIVE ECOSYSTEMS: GLASS SPONGE REEFS

The Hecate Strait and Queen Charlotte Sound Glass Sponge Reefs are incredibly fragile and vulnerable to both physical damage from anchors as well as sedimentation, which can choke the reefs as the sponges stop filtering oxygen or food from the water. The MPA consists of a Core Protection Zone (CPZ) that is highly protected and immediately surrounds the reefs, and an Adaptive Management Zone (AMZ) around that which acts as a buffer zone, allowing some activities to occur providing they do not harm the reefs.

Anchoring is prohibited within the CPZ to protect them from damage but is allowed within the AMZ. However, in some areas the AMZ is little more than 100m from the edge of the reefs (median distance 700m). Although anchoring is unlikely given the location, this presents a considerable risk of direct damage to the reefs and from sediment plumes as the anchor is deployed and retrieved. It should be noted that the entire AMZ is closed to bottom contact fisheries and mid-water trawl to reduce the risks of direct damage and sediment plumes. Recent studies have demonstrated that sediments may be carried over 2 km under water and so the AMZ may need to be expanded.[60] We strongly recommend that the AMZ of the Hecate Strait and Queen Charlotte Sound Glass Sponge Reef MPA is closed to anchoring and that the outer boundary of the AMZ is expanded to 6 km to provide protection from sediment.[61]

Infrastructure

The maintenance and upgrade of existing infrastructure, as well as the creation of new infrastructure, is important for both public safety and environmental protection. Creation of coastal MPAs provides an opportunity to invest in beneficial infrastructure, such as waste facilities and safe moorage, that will benefit communities and reduce risks to marine ecosystems. However, the environmental impacts of infrastructure projects need to be identified and mitigated. Currently, most MPA regulations and management plans lack specific details provided around location of projects or mitigation requirements.

16 **MPA management plans should clearly identify the location, nature, and condition of existing and potential infrastructure, as well as sensitive habitats and species, and necessary mitigation measures. Long-term management objectives should be developed to improve coastal infrastructure, in partnership with other relevant jurisdictions.**

INVESTING IN INFRASTRUCTURE

The Gilbert Bay MPA management plan references two incidents that highlight the need for investment in coastal infrastructure to protect marine ecosystems: an oil spill from a tanker that was servicing a diesel generator, and a fire that destroyed a wharf littering the area with debris.

MPAs and Indigenous Protected Areas that are established close to communities need to invest in upland infrastructure that will benefit the communities and reduce the risk of spills, debris, and other environmental impacts. In the example of Gilbert Bay, this could mean upgrading the energy supply to renewable energy sources, as is being done for many remote communities, and upgrading (or now repairing) the wharf. Such investments will not only reduce environmental risks but will also provide long-term and tangible benefits to communities thereby building support for MPAs.

Aquaculture

Aquaculture is only explicitly identified and addressed as a potential activity in one MPA, although other regulations, such as prohibitions on anchoring, and disposing of or occupying lands, would likely preclude aquaculture operations in other MPAs. In Canada, aquaculture operations are currently limited to sheltered coastal waters however there is a growing interest in the concept of offshore aquaculture, which was identified as a potential area for growth in the Blue Economy Strategy engagement paper.[45]

Consideration needs to be given to the variety and scale of potential impacts including dumping, entanglement risks, invasive species and habitat/species displacement, and the impacts of associated infrastructure and vessel traffic for deployment and maintenance.

17 **Open-net pen finfish aquaculture should be prohibited from all MPAs. Other potential aquaculture activities — including developing technologies — should be carefully considered. Regulations and management guidelines should address dumping, entanglement risk, invasive species and species displacement, and the cumulative impacts of infrastructure and vessel traffic.**

Non-extractive uses, scientific research & biotechnology

Most MPAs include exemptions for non-extractive activities (tourism and recreation) and research but require an activity application that details all aspects of the proposed research and potential impacts. However, there is little publicly available information on approved activities. The Basin Head MPA management plan included a list of all approved research projects; this should be done for all MPAs.

Not all research activities are non-extractive or without risk. As noted above, scientific bottom trawl surveys currently occur inside MPAs. Even non-extractive research methods can impact sensitive ecosystems and species. Biotechnology has been identified as a potential area for growth in Canada's Blue Economy Strategy,[45] and MPAs may be of interest for commercial research.

18 **Where possible, research activities in MPAs should be limited to non-extractive and non-invasive methods. Activities and projects that have received approval should be publicly listed on the MPA webpage and summarized in the MPA management plan.**

Photo NOAA

Charting a course to protect 30% by 2030 in strong MPAs

Canada has made ambitious commitments to significantly increase both the quantity and quality of MPAs. In doing so, we are charting a course to a healthy, resilient ocean that supports thriving and sustainable fisheries, and flourishing coastal communities. To realize this vision, in the next nine years Canada will need to double the area currently protected while addressing management issues that are outstanding in the majority of existing MPAs.

Most of the existing MPAs we assessed did not fully meet the minimum protection standards, and just less than 10 % of the area we evaluated is strongly protected. However, these results are being driven by a few large, not zoned and lightly protected or incompatible sites—namely the Scott Islands, Tuvaijuittuq and Tallurtiup Imanga. As the latter two have yet to be finally designated there is ample opportunity to significantly improve protection levels. Conversely, as *The MPA Guide* includes supporting management measures beyond the MPA regulations, some of which are policy-based and lack permanence, there is the possibility that some MPAs may be downgraded if additional protection measures are repealed.

Here we have presented a series of recommendations to address these concerns and strengthen protections. In many cases, this will require simply clarifying the prohibitions and providing clear definitions of activities. The broad general prohibition for *Oceans Act* MPAs and mNWAs should theoretically provide blanket protections for sites and effectively address emergent threats and future uses. However, the large number of exceptions that have been applied to date—including exceptions for bottom trawling and oil and gas activities—clearly contradict the general prohibition and undermine its application in other sites. For this reason, clear definitions and explicit prohibitions/permissions are needed for all activities.

Photo Will Turner

A short-term solution is to use MPA management plans to provide explicit management directions for all potential activities and threats, and address any gaps in the regulations. However, regulatory amendments are required to provide assured, long-term protection. In many instances there are existing management measures in place such as policy moratoria, or activities are not currently occurring, so strengthening the regulations would have little immediate socioeconomic impact but potentially considerable long-term gain. Implementing the minimum protection standards would address some of the weaknesses identified by *The MPA Guide*, particularly for activities like bottom trawling, mining and oil and gas that are considered incompatible and would cause irreparable harm. According to this analysis, implementing the minimum protection standards would ensure most sites were at least weakly protected and not incompatible with biodiversity conservation.

19 ***The MPA Guide*** **can provide a useful framework for the consideration of current and potential future activities and expected benefits. For existing MPAs,** ***The MPA Guide*** **could be used to guide revisions to the management plan, and for future MPAs it provides a useful framework for planning and regulations.**

However, there are conditional factors that are not captured in this analysis but that are critical to MPA function. These factors include the MPA size and design, governance and equitability, strength of the conservation objectives, and available resources and capacity. As such, the scores calculated using *The MPA Guide* might ignore significant weaknesses and overestimate effectiveness. For example, both Eastport and Laurentian Channel score as highly and fully protected according to *The MPA Guide*; however recent studies have pointed to the fact that both MPAs exclude areas that are ecologically important and may thus fail in meeting some of their conservation objectives.[20] [63]

As Canada strives to protect 30 % by 2030 it is important that quality is not sacrificed for quantity. There are several sites currently underway that will be counted towards the 25 % and 30 % targets. These include the Southern Strait of Georgia NMCAR in BC, Fundian Channel-Browns Bank MPA in Nova Scotia, and St. Lawrence Estuary MPA in Québec, as well as MPA networks in northern BC, the Maritimes, the Gulf of St Lawrence, and Newfoundland and Labrador Shelves. Many of these sites are in busy coastal locations, that are jurisdictionally complex, and have been heavily exploited. This analysis and *The MPA Guide* framework identify some of the potential considerations and challenges that should be considered in planning these sites with the minimum protection standards in mind. Given the breadth and complexity of these issues and there is a need to work more effectively across agencies and governments.

Photo Eric Mclean

Photo Mike Doherty

20 **More robust processes or structures need to be put in place to support better coordination across departments and agencies to ensure that all activities are appropriately managed.**

The High Level Panel for a Sustainable Ocean Economy emphasized the need to protect 30 % of the ocean in strongly protected MPAs as the central pillar of a productive and prosperous blue economy. Implementing the minimum protection standards will provide Canada's MPAs with critical protection that will ensure effectiveness. As the country with the longest coastline in the world bordering three oceans, Canada has a unique opportunity to set a global standard for marine protection and shore up its legacy as an ocean leader.

Appendix

Table 7. Minimum standards by zone and by MPA (see colour key on pg 89)

MPA Name	Are minimum standards being met?				
	Trawling	**Mining**	**Oil & Gas**	**Dumping**	**Overall**
Eastport	No-take MPA.	General *Oceans Act* prohibition against damaging, disturbing & destroying.	Activity is not appraised in the RIAS. General *Oceans Act* prohibition against damaging, disturbing & destroying (no exemption for activity).	Specific *Oceans Act* prohibition against depositing, discharging or dumping.	Meets the minimum standards in practice. Needs a clear statement on oil and gas.
Gilbert Bay	Exception in the MPA Regulations for any fishing (regulated under the *Fisheries Act*) in Zones 2 and 3.	No existing licenses or exemptions but RIAS notes that MPA "does not foreclose on all opportunities in perpetuity."	No existing licenses or exemptions but RIAS notes that MPA "does not foreclose on all opportunities in perpetuity."	Specific *Oceans Act* prohibition against depositing, discharging or dumping.	Zones 2 and 3 do not meet the minimum standards as trawling permitted. Needs a clear statement on oil and gas.
Laurentian Channel	No commercial fishing is permitted.	General *Oceans Act* prohibition against damaging, disturbing & destroying.	No active leases. General *Oceans Act* prohibition against damaging, disturbing & destroying (no exemption for activity).	General *Oceans Act* prohibition against damaging, disturbing & destroying but no prohibition against depositing, discharging or dumping.	Commitment to minimum protection standards. Needs clarification of prohibition on dumping, with clear definition.
St. Anns Bank	No exemption from the general *Oceans Act* prohibition against damaging, disturbing & destroying in the MPA Regulations for bottom trawling.	General *Oceans Act* prohibition against damaging, disturbing & destroying.	No active leases. General *Oceans Act* prohibition against damaging, disturbing & destroying (no exemption for activity).	General *Oceans Act* prohibition against damaging, disturbing & destroying but no prohibition against depositing, discharging or dumping.	Needs clarification of prohibition on dumping, with clear definition.

MPA Name	Are minimum standards being met?				
	Trawling	**Mining**	**Oil & Gas**	**Dumping**	**Overall**
The Gully	Moratorium on trawling. Potential for trawling in Zone 3 if lifted.	General *Oceans Act* prohibition against damaging, disturbing & destroying.	Existing license in Zone 3 west. C-NSOPB policy prohibits activity.	Dumping permitted in Zone 3. *	Zone 3 does not meet the minimum standards as dumping allowed, and oil and gas may be allowed in future if the policy prohibition is lifted, and a bottom trawl fishery may be allowed if it is deemed to occur within the natural variation of the zone.
Basin Head	Trawling allowed in Zone 3 under the Regulations, but a Scallop Buffer Zone OECM overlaps the area.	General *Oceans Act* prohibition against damaging, disturbing & destroying.	No reference to oil and gas activities in RIAS or regulations though there are licenses nearby.	Specific *Oceans Act* prohibition against depositing, discharging or dumping.	Zone 3 does not meet standards as trawling allowed though Scallop Buffer zone. OECM (SFA 24) prohibits dragging. Oil & gas not addressed, though unlikely in Zones 1&2.
Musquash Estuary	Scallop dragging allowed in Zone 3.	General *Oceans Act* prohibition against damaging, disturbing & destroying but "do not foreclose on all opportunities in perpetuity."	Province retains rights but have withdrawn lands from prospecting. The RIAS notes that the MPA "does not foreclose on all opportunities in perpetuity."	Specific *Oceans Act* prohibition against depositing, discharging or dumping.	Zones 3 does not meet the minimum standards as trawling permitted. Needs a clear statement on oil and gas prohibitions.
Banc-des-Américains	No exemption from the general *Oceans Act* prohibition against damaging, disturbing & destroying in the MPA Regulations.	General *Oceans Act* prohibition against damaging, disturbing & destroying.	No claims/ licenses exist, and Provincial legislation is in effect. General *Oceans Act* prohibition against damaging, disturbing & destroying (no exemption for activity).	Dumping prohibited from vessels >400t or carrying >15 people.	MPA meets minimum protection standards, however, dumping from smaller vessels may need to be considered.
Saguenay-St Lawrence	Trawling is allowed.	Management plan specifies activities are prohibited.	Management plan specifies activities are prohibited.	Dumping is not prohibited.	MPA does not meet the minimum standards as trawling occurs in a small area. Dumping not addressed.

MPA Name	Are minimum standards being met?				
	Trawling	**Mining**	**Oil & Gas**	**Dumping**	**Overall**
Gwaii Haanas	Trawling permitted in the Multiple Use Zone.	Provincial and federal moratoria is in effect for BC. NMCA Act and Regulations prohibits the exploration or exploitation of hydrocarbons, minerals, aggregates, or any other inorganic matter.	Provincial and federal moratoria is in effect. NMCA Act and Regulations prohibits the exploration or exploitation of hydrocarbons, minerals, aggregates, or any other inorganic matter.	NMCA Act and Regulations prohibit the disposal of any substance (unless authorized by a permit issued under strict condition).	Multiple Use Zone does not meet minimum standards as trawling is permitted.
Hecate Strait Glass Sponge Reefs	Bottom contact fishing and mid-water trawling prohibited.	General *Oceans Act* prohibition against damaging, disturbing & destroying.	An existing exploration license remains in place despite provincial and federal moratoria. RIAS flags potential review of prohibition. General *Oceans Act* prohibition against damaging, disturbing & destroying (no exemption for activity).	General *Oceans Act* prohibition against damaging, disturbing & destroying but no prohibition against depositing, discharging or dumping.	Unclear if MPA meets minimum standards. Needs clarification of prohibition on dumping, with clear definition. Oil and gas activities currently prohibited but may be reconsidered in future.
Scott Islands	Trawling is permitted.	May be allowed if provincial & federal moratoria lifted.	Existing licenses. May be allowed if provincial & federal moratoria lifted.	Specific prohibition against depositing, discharging or dumping.	MPA does not meet the minimum standards as trawling permitted throughout. Mining and oil and gas may be allowed in future if federal and provincial moratoria are lifted.

MPA Name	Are minimum standards being met?				
	Trawling	**Mining**	**Oil & Gas**	**Dumping**	**Overall**
SGaan Kinghlas-Bowie Seamount	No exemption from the general *Oceans Act* prohibition against damaging, disturbing & destroying in the MPA Regulations.	General *Oceans Act* prohibition against damaging, disturbing & destroying.	Provincial and federal moratoria are in effect and Council of Haida Nation resolution against oil and gas. General *Oceans Act* prohibition against damaging, disturbing & destroying (no exemption for activity).	Specific *Oceans Act* prohibition against depositing, discharging or dumping.	MPA meets minimum standards in practice. A clear statement on oil and gas and withdrawal of any existing rights is needed.
Endeavour Hydrothermal Vents	Not likely to occur given depth and location but there is an exception from the general *Oceans Act* prohibition against damaging, disturbing & destroying in the MPA Regulations for any fishing (regulated under the *Fisheries Act*).	General *Oceans Act* prohibition against damaging, disturbing & destroying. Mining is identified as inconsistent with objectives and limited in potential.	Provincial and federal moratoria are in effect. General *Oceans Act* prohibition against damaging, disturbing & destroying (no exemption for activity).	No prohibition against depositing, discharging or dumping and is acknowledged as an existing activity.	MPA does not meet the minimum standards as dumping is not prohibited and recognized as an existing activity. All commercial fishing is allowed as per *Fisheries Act* so a clear prohibition on bottom contact fisheries is needed.

MPA Name	Are minimum standards being met?				
	Trawling	**Mining**	**Oil & Gas**	**Dumping**	**Overall**
Tarium Niryutait	Trawling is not currently taking place but there is an exception from the general *Oceans Act* prohibition against damaging, disturbing & destroying in the MPA Regulations for any fishing (regulated under the *Fisheries Act*).	General *Oceans Act* prohibition against damaging, disturbing & destroying.	Oil and gas licenses and activities are exempt from the general *Oceans Act* prohibition against damaging, disturbing & destroying. Existing licenses continue to be held, a moratorium is in effect but is subject to review every five years.	Specific *Oceans Act* prohibition against depositing, discharging or dumping.	MPA does not meet the minimum standards. Oil and gas licenses and activities are exempt from the prohibitions. A short-term (five-year) moratorium expires 2021. Trawling is not prohibited but not currently happening.
Anguniaqvia niqiqyuam	Trawling is explicitly prohibited in the MPA Regulations.	General *Oceans Act* prohibition against damaging, disturbing & destroying.	Early on in establishment, an exemption for oil and gas was requested and denied. A five-year moratorium is in effect. General Oceans Act prohibition against damaging, disturbing & destroying (no exemption for activity).	General *Oceans Act* prohibition against damaging, disturbing & destroying but no prohibition against depositing, discharging or dumping.	Needs clarification of prohibition on dumping, with a clear definition of the activity.

MPA Name	Are minimum standards being met?				
	Trawling	**Mining**	**Oil & Gas**	**Dumping**	**Overall**
Tuvaijuittuq	Trawling is not currently happening. Prohibition is temporary due to interim protection.	No mining happening. Prohibitions are temporary due to interim protection.	No oil and gas happening. Prohibitions are temporary as interim protection. A moratorium is in effect but is subject to review every five years.	General Oceans Act prohibition against damaging, disturbing & destroying but no prohibition against depositing, discharging or dumping.	A current Interim protection order prohibits trawling, mining and oil and gas but expires in 2024.*** The five-year Arctic oil and gas moratorium is up for renewal in 2021.
Tallurutiup Imanga	Trawling is not currently happening but is not yet prohibited.	NMCA Act will prohibit the exploration or exploitation of hydrocarbons, minerals, aggregates, or any other inorganic matter (pending any exceptions). No licenses or existing activities remain.	NMCA Act will prohibit the exploration or exploitation of hydrocarbons, minerals, aggregates, or any other inorganic matter (pending any exceptions). No licenses remain and a moratorium is in effect but is subject to review every five years.	NMCA Act will prohibit the disposal of any substance within an NMCA (unless authorized by a permit issued under strict condition). **	As a proposed site, regulations have yet to be determined. The NMCA Act does prohibit mining and oil and gas and dumping without permit (unless exemptions are provided).

*Activities are allowed in Zone 3, provided any associated disturbance, damage or destruction is within the natural variation of the ecosystem. Terms like "disturbance", "vicinity" and "natural variation" are not well-defined.

**Dumping may currently be occurring at moderate to high levels.[47]

***Interim protection, by a Ministerial Order introduced through legislative amendments in 2019, has only been used once in the designation of the Tuvaijuittuq interim MPA. This interim MPA order freezes the footprint of existing activities in the area for up to five years, while parties undergo the consultation and designation process for a full *Oceans Act* MPA .

Meets minimum protection standard or meets with caveats

Does not meet minimum protection standard

Unclear

Table 8. Summary of activities in federal MPAs using *The MPA Guide* framework

	Fishing	Mining	Oil and Gas	Dredging and Dumping	Anchoring and Navigation	Infrastructure	Aquaculture	Recreation and Non-extractive Activities	Notes
Eastport	General Oceans Act prohibition on disturbing, damaging, destroying, or removing any living marine organisms or any part of their habitat.								The MPA may not be sufficiently large to achieve all the conservation objectives.
	Prohibition on depositing, discharging, or dumping any substance, or causing any substance to be deposited, discharged, or dumped that is likely to result in the disturbance, damage, destruction or removal of a living marine organism or any part of its habitat.								
	Commercial and recreational fishing is prohibited.	There is no reference to mining activities or prospects in the Regulatory Impact Analysis Statement (RIAS) and there is no explicit exemption to the general prohibition.	There is no reference to oil and gas activities or prospects in the Regulatory Impact Analysis Statement (RIAS) and no explicit exemption to the general prohibition.	Dumping is explicitly prohibited. There is no exemption to the general prohibition for dredging.	There is no explicit exemption or prohibition in the MPA regulations. Boaters are permitted within the MPA but are asked to take every precaution and exercise due diligence while operating a vessel near these waters.	There is no explicit exemption or prohibition of the infrastructure in the MPA regulations.	RIAS states that aquaculture operations would be prohibited within the MPA but may occur in adjacent waters.	Activities are managed through the submission and approval of an Activity Plan.	
Gilbert Bay	General Oceans Act prohibition on disturbing, damaging, destroying, or removing any living marine organisms or any part of their habitat.								Clarity is needed regarding mining and oil and gas. There are no exemptions for oil and gas activities or mining, however the RIAS suggests that oil and gas and mining are not prohibited under the general prohibition and regulations. In Newfoundland and Labrador, offshore oil and gas is regulated by a provincial-federal Accord governed by the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB).
	Prohibition on depositing, discharging, or dumping any substance, or causing any substance to be deposited, discharged, or dumped that is likely to result in the disturbance, damage, destruction or removal of a living marine organism or any part of its habitat.								
	Commercial fishing is prohibited in Zone 1 and allowed in Zones 2 and 3. Scallop fishing (dragging) is permitted in Zones 2 and 3. Recreational fishing is allowed.	There are no existing licenses or exploration activities. There is no explicit exemption or prohibition in the MPA regulations, however the RIAS notes that the MPA "does not foreclose on all opportunities in perpetuity."	There are no existing licenses or exploration activities. There is no explicit exemption or prohibition in the MPA regulations, however the RIAS notes that the MPA "does not foreclose on all opportunities in perpetuity."	Dumping is explicitly prohibited. There is no reference to dredging however scallop trawling is allowed and infrastructure projects may require dredging.	There is no explicit exemption or prohibition in the MPA regulations. Boaters are permitted within the MPA but are asked to take every precaution and exercise due diligence while operating a vessel near these waters.	Maintenance, repair or removal of a wharf, causeway or bridge is permitted throughout. Construction of a wharf is permitted in Zones2 and 3.	There is no explicit exemption or prohibition of aquaculture in the MPA regulations.	Activities are managed through the submission and approval of an Activity Plan.	
Laurentian Channel	General Oceans Act prohibition on disturbing, damaging, destroying, or removing any living marine organisms or any part of their habitat, and activities likely to do so.								Laurentian Channel was announced as the first MPA to meet Canada's minimum protection standards, however it is not clear that dumping is comprehensively prohibited. The boundary for the MPA was reduced considerably during the MPA planning process to accommodate commercial activities. As a result, ecologically and biologically significant areas are excluded.
	Site adheres to a new set of minimum protection standards that will prohibit recreational and commercial fishing, oil and gas exploration and exploitation, mining, and dumping throughout the MPA.								
	Commercial and recreational fishing is prohibited.	There are no exemptions for mining activity in the MPA regulations. The RIAS clearly states that mining is prohibited. Mineral potential is unknown.	There are no exemptions for oil and gas activities in the MPA regulations. The RIAS clearly states that oil and gas activities are prohibited. There are known gas deposits.	Dumping not explicitly mentioned in regulations. Vessels may conduct ballast water exchanges in a portion of the MPA under certain conditions.	All navigation is allowed within the MPA, apart from anchoring, which is prohibited in Zone 1 to protect sensitive benthic coral and sea pen concentrations.	Installation, repair, and maintenance of submarine cables continue to be allowed in one or more zones if they are not likely to destroy marine habitat.	There is no explicit exemption or prohibition of aquaculture in the MPA regulations.	Activities are managed through the submission and approval of an Activity Plan.	

	Fishing	Mining	Oil and Gas	Dredging and Dumping	Anchoring and Navigation	Infrastructure	Aquaculture	Recreation and Non-extractive Activities	Notes
The Gully	Variation of the General Oceans Act prohibition on disturbing, damaging, destroying, or removing any living marine organisms or any part of their habitat, including the subsoil to a depth of 15 m of the seabed.								Overlapping *Fisheries Act* closures and policy prohibitions on oil and gas are temporary and can be altered or discontinued, leaving a gap in full protection.
	Prohibition on depositing, discharging, or dumping of substances within the MPA, and in areas in the vicinity of the MPA, that is likely to result in the disturbance, damage, destruction or removal of any living marine organisms or any part of their habitat, including the seabed and subsoil to a depth of 15 m.								
	Commercial and recreational fishing are prohibited in Zone 1. Pelagic and bottom longlining occurs in Zones 2 and 3. Trawling is not occurring but may be allowed in Zone 3 if impacts are within natural variation.	According to the RIAS the mineral potential is limited to aggregates, and removal of seabed to 15m is prohibited under the regulations.	The MPA regulations do not remove existing licenses within the MPA (i.e., Primrose Significant Discovery Licence in Zone 3), or prevent the issuance of future petroleum rights. The C-NSOPB has prohibited exploration in the MPA since 1998	Dredging and dumping may be allowed in Zone 3 providing the disturbance, damage, destruction, or removal is limited to Zone 3 and is within the natural variation of the ecosystem.	There is no explicit exemption or prohibition of anchoring or navigation in the MPA regulations. The Notice to Mariners issued by the Canadian Coast Guard recommends voluntary avoidance of the area.	There is no explicit exemption or prohibition of infrastructure activities in the MPA regulations.	There is no explicit exemption or prohibition of aquaculture in the MPA regulations.	Activities are managed through the submission and approval of an Activity Plan.	
St Anns Bank	General Oceans Act prohibition on disturbing, damaging, destroying, or removing any living marine organisms or any part of their habitat, and activities likely to do so.								It is our understanding that the current bottom longline fishery within the MPA is minimal, however there is nothing in the regulations that limits the scale or catch to current levels.
	Commercial and recreational fishing is prohibited. Zones 2 and 3 allow moderate impact fishing including limited longlining, traps, hook and line, and gillnets.	There are no existing or proposed mineral extraction activities, and no exception to the prohibition is provided.	There are no existing or proposed oil and gas activities within or adjacent to the MPA, and no exception to the prohibition.	There is no explicit prohibition of dumping in the MPA regulations, as was included for earlier *Oceans Act* MPAs. There is no explicit exemption for any dredging.	Navigation is permitted. Vessels must comply with all relevant provisions of the Marine Mammal Regulations pursuant to the *Fisheries Act*. There is no restriction of anchoring though this may be unlikely due to location	There is no explicit exemption or prohibition of infrastructure activities in the MPA regulations	There is no explicit exemption or prohibition of aquaculture in the MPA regulations.	Activities are managed through the submission and approval of an Activity Plan.	

	Fishing	Mining	Oil and Gas	Dredging and Dumping	Anchoring and Navigation	Infrastructure	Aquaculture	Recreation and Non-extractive Activities	Notes
Musquash Estuary	General Oceans Act prohibition on disturbing, damaging, destroying, or removing any living marine organisms or any part of their habitat.								The Government of New Brunswick reserves the right to all coal, minerals, oils and natural gas within the watershed, the lands have been withdrawn from prospecting and staking pursuant to the Government of New Brunswick Order in Council 2008-54 and all pre-existing mineral claims have expired.
	Prohibition on depositing, discharging, or dumping any substance, or causing any substance to be deposited, discharged, or dumped that is likely to result in the disturbance, damage, destruction or removal of a living marine organism or any part of its habitat.								
	Limited commercial and recreational fishing by hand, dip net or angling is allowed in Zone 1. Trap and net fishing are allowed in Zone 2, scallop dragging is allowed in Zone 3.	There are no mineral leases within the MPA but there are adjacent to the MPA. The Province has withdrawn lands from prospecting. Exploration and extraction are not specifically excluded and the regulations "do not foreclose on all opportunities in perpetuity."	There are no current oil and gas leases within the MPA, and the Province has withdrawn lands from prospecting. The MPA regulations do not specifically exclude exploration or development activities.	Dumping is explicitly prohibited. The construction, maintenance and repair of boat launches, wharfs, or navigational channels in Zone 2a may involve dredging. The site is vulnerable to runoff from upland areas.	There is no explicit exemption or prohibition for anchoring in the MPA regulations, however, speed restrictions for all zones are set and motorized vessels are not permitted in Zone 1.	Boat launches, wharfs, or navigational channels may be constructed, repaired, removed, or maintained in Zone 2a.	There is no explicit exemption or prohibition of aquaculture in the MPA regulations. There were no applications or leases at the time of designation.	Activities are managed through the submission and approval of an Activity Plan.	
Saguenay-St. Lawrence	The Marine Park was established under its own legislation which is mirrored in Québec and sets out the rights and authorities of the Minister to manage activities within the Marine Park and under which, regulations are set out. The Management Plan describes the intended zoning plan and prohibited and permitted activities. The zoning plan has not yet been fully implemented.								A zoning plan has been developed for the Saguenay-St. Lawrence Marine Park but has not yet been fully implemented. Although trawling is not prohibited within the MPA we understand it is limited and infrequent and the management plan clearly states an intention to prohibit in the future. The Management Plan was developed in 2010 and has since been reviewed but no updates have been made. The Management Plan and website are particularly clear and comprehensive.
	Scallop trawling is permitted throughout the MPA though it only occurs in a portion and may be infrequent. The zoning plan recognizes trawling as incompatible with the objectives of the marine park.	All mining and mineral extraction and prospecting is prohibited.	All oil and gas activities, including the laying of oil or gas pipelines or power lines, are prohibited.	Periodic dredging to maintain access to wharves is allowed. Dumping is not prohibited and discharge from upland sources and vessels are identified as a threat.	Recreational anchoring and mooring for non-commercial purposes are permitted, public mooring for commercial purposes is allowed with a permit. Vessel operations are managed to limit impact on whales.	Maintenance of marinas, wharfs, buoys and lighthouses is permitted. New boat launch facilities and floating pontoons are also allowed with permits from relevant authorities.	Aquaculture is not currently prohibited but has been identified as an activity that is incompatible and will eventually be banned.	Most non-commercial recreational and educational activities are permitted. Commercial recreational activities require a permit.	
Banc-des-Américains	General Oceans Act prohibition on disturbing, damaging, destroying, or removing any living marine organisms or any part of their habitat, or is likely to do so.								The MPA regulations do not include the blanket prohibition against dumping that older Oceans Act MPAs have but do explicitly prohibit dumping from vessels over a certain size.
	Commercial and recreational fishing is prohibited in Zone 1. Zone 2 is open to moderate impact fishing activities including longlining and trap.	There are no existing or proposed mining activities, prospects are low, and no exception to the prohibition is provided. Provincial legislation also prohibits mining.	There are no existing or proposed oil and gas activities, and prospects are low to medium. There are no exceptions to the prohibition. Provincial legislation prohibits oil and gas.	Dumping is prohibited from vessels more than 400 gross tonnage or more or certified to carry 15 persons or more. There is no reference to or exemptions for dredging.	Navigation may be carried out in the Marine Protected Area, but a vessel must not anchor in the core protection zone. Vessels must comply with the Marine Mammal Regulations.	There are no exemptions for infrastructure. A proposal to exempt a subsea cable within the MPA was rejected.	There is no explicit exemption of aquaculture in the MPA regulations.	Activities are managed through the submission and approval of an Activity Plan.	

	Fishing	Mining	Oil and Gas	Dredging and Dumping	Anchoring and Navigation	Infrastructure	Aquaculture	Recreation and Non-extractive Activities	Notes
Basin Head	General Oceans Act prohibition on disturbing, damaging, destroying, or removing any living marine organisms or any part of their habitat.								The overlapping Scallop Buffer Zone OECM fishing closure is intended to provide long term protection but as currently established could be altered or delisted thereby opening the area to bottom trawling. The MPA regulations rely on the *Navigable Waters Protection Act* and *Fisheries Act* to ensure that any infrastructure activities will be consistent with the conservation objectives of the MPA.
	Prohibition on depositing, discharging, or dumping any substance, or causing any substance to be deposited, discharged, or dumped that is likely to result in the disturbance, damage, destruction or removal of a living marine organism or any part of its habitat.								
	Commercial and recreational fishing is prohibited in Zone 1, limited in Zone 2, and allowed in Zone 3. Current fishing activity is limited to angling and longlining. Bottom trawling is not prohibited by the MPA regulations but is prohibited by the Scallop Buffer Zone OECM which overlaps Zone 3.	There are no existing mining activities or prospects identified in the RIAS and no exemption in the MPA regulations. The Province of PEI has a moratorium on sand extraction.	There are no existing licenses or prospects identified in the RIAS and no exemption in the MPA regulations.	Dumping is prohibited but the site is vulnerable to runoff from upland areas.	Motorized vessels are not permitted in Zone 1 and are only permitted to transit Zone 2 to access a boat launch. There is no prohibition on anchoring.	The maintenance, repair, or removal of a bridge or boat launch will be permitted in Zones 2 and 3, if authorized under the *Navigable Waters Protection Act* or the *Fisheries Act*.	There is no explicit exemption of aquaculture in the MPA regulations. The potential for Irish moss to be collected as brood stock for aquaculture elsewhere.	Recreational activities including swimming, diving and use of motorized vessels is prohibited in Zone 1. Vessels are also restricted in Zone 2. Activities are managed through the submission and approval of an Activity Plan.	
Endeavour Hydrothermal Vents	Variation of the General Oceans Act prohibition on disturbing, damaging, destroying the Area, or removing from the Area, any part of the seabed, including a venting structure, or any part of the subsoil, and any living marine organism or any part of its habitat.								The federal and provincial moratoria on offshore oil and gas and mining in BC have been in place since the 1970s and have since withstood attempts to overturn them.
	Prohibition on any underwater activity in the Area that is likely to result in the disturbance, damage, destruction, or removal of anything referred to above.								
	All fishing activities are allowed as they are pelagic. There are no known benthic species of commercial value.	There is limited mineral potential and the Management Plan states that mining would be inconsistent with the objectives and prohibitions.	Prospects for oil and gas exploration in the MPA are exceptionally low and there are provincial and federal moratoria on oil and gas activities. There is no explicit exemption for oil and gas.	There is no explicit prohibition of dumping in the MPA regulations as with other *Oceans Act* MPAs. The Management Plan identifies potential dumping from research activities. There are no exceptions to the general prohibition for dredging.	Anchoring by ships is not likely due to the exposed location and depth. Navigation in surface waters is permitted.	The remoteness and depth make infrastructure unlikely however, infrastructure for research may be allowed and has been identified as a potential source of damage. Limiting the footprint is recommended.	There is no explicit exemption for aquaculture in the MPA regulations. Aquaculture is highly unlikely however offshore aquaculture may be considered in future.	Activities are managed through the submission and approval of an Activity Plan. Risks from scientific research activities are the main focus for the MPA Management Plan.	

	Fishing	Mining	Oil and Gas	Dredging and Dumping	Anchoring and Navigation	Infrastructure	Aquaculture	Recreation and Non-extractive Activities	Notes
Hecate Strait Glass Sponge Reefs	General Oceans Act prohibition on disturbing, damaging, destroying, or removing any living marine organisms or any part of their habitat, or is likely to do so. Prohibition on any scientific research or monitoring, or any educational activity, unless it is part of an Activity Plan that has been approved by the Minister.								Given the fragility and uniqueness of the reefs anchoring and cable laying in the AMZ pose an unacceptable risk. Recent studies have found that glass sponges are extremely sensitive to sedimentation and suggest the AMZ is not large enough to provide adequate protection.
	Bottom contact fisheries are prohibited in both the Core Protection Zone (CPZ) and Adaptive Management Zone (AMZ); this includes midwater trawling and Aboriginal fishing. Pelagic fisheries are permitted providing the gear does not enter the CPZ.	There are no leases or potential for mineral or aggregate extraction referenced in the RIAS and no explicit exemption of mining in the MPA regulations.	There are existing licenses for oil and gas within the MPA however there are also long-standing moratoria in place. The RIAS states that the any activities associated with oil and gas production, including seismic are prohibited under the general prohibition but that decision could be revisited should moratoria be lifted and regulatory regimes established in future.	There is no explicit prohibition of dumping in the MPA regulations, as was included for earlier *Oceans Act* MPAs. There is no exemption for dredging activities.	Navigation of vessels is permitted in the AMZ and vertical AMZ (VAMZ) in accordance with the *Canada Shipping Act*. Anchoring is prohibited in the CPZ but not the AMZ. Although likely to be low in frequency due to the exposed nature of the reefs, anchor damage would be devastating to the reefs and poses an unacceptable risk.	The MPA regulations permit the laying, maintenance, or repair of cables in the AMZ if it is not likely to result in the damage, destruction, or removal of any part of the glass sponge reefs. Given the proximity of the AMZ to the reefs and fragility of the reefs this presents an un-acceptable risk.	There is no explicit exemption for aquaculture in the MPA regulations. Aquaculture is highly unlikely however offshore aquaculture may be considered in future.	Activities are managed through the submission and approval of an Activity Plan. Given the location of the MPA, there is minimal recreational and non-extractive use.	
SGaan Kinghlas-Bowie Seamount	Variation of the General Oceans Act prohibition on disturbing, damaging, destroying, or removing any living marine organisms or any part of their habitat, or any part of the seabed. Prohibition on depositing, discharging, or dumping any substance, or causing any substance to be deposited, discharged, or dumped that is likely to result in the disturbance, damage, destruction or removal of a living marine organism or any part of its habitat.								The MPA is not zoned so management measures apply across the site. The Management Plan states that the SK-B Management Board will "address new and emerging threats to seamount ecosystems, including fishing and deep-sea mining."
	All bottom contact fishing was prohibited in 2018. There is no commercial fishing allowed, some recreational pelagic fishing occurs but is limited.	The RIAS notes that there are no existing interests and no potential for mineral extraction. There are no explicit exemptions for mining in the MPA regulations.	The RIAS notes that there are no existing interests and no potential for oil and gas extraction. There are no explicit exemptions for mining in the MPA regulations. There are federal and provincial moratoria in place and the Haida Nation has passed a resolution opposing offshore oil and gas.	Dumping is prohibited. There are no exemptions for dredging activities.	There is no explicit prohibition of anchoring in the MPA regulations. Vessel travel is allowed throughout the MPA, but the Management Plan recommends that transiting vessels avoid the MPA to minimize impacts. The Haida Nation has recently advocated for a mandatory exclusion zone for shipping traffic.	There are no potential infrastructure needs identified in the RIAS and no exemptions for infrastructure in the MPA regulations.	There is no explicit exemption for aquaculture in the MPA regulations.	In addition to Haida knowledge and use, activities are managed through the submission and approval of an Activity Plan.	

	Fishing	Mining	Oil and Gas	Dredging and Dumping	Anchoring and Navigation	Infrastructure	Aquaculture	Recreation and Non-extractive Activities	Notes
Gwaii Haanas	The NMCA Act prohibits the disposal or occupation of public lands; exploration for and exploitation of hydrocarbons, minerals, aggregates, and any other inorganic matter; and the disposal of any substance unless authorized by a permit.								Bottom trawling is permitted throughout the Multiple Use Zone though may actually only occur in a small portion of it.
	Commercial and recreational fishing are prohibited within the Restricted Access and Strict Protection Zones but allowed within the Multiple Use Zone. Bottom trawling is allowed in the Multiple Use Zone.	Mining is explicitly prohibited in the MPA regulations.	Oil and gas activities are explicitly prohibited in the MPA regulations.	Dumping is explicitly prohibited. The creation of docks in one or more zones may result in authorized dredging.	Boat access is prohibited in the Restricted Access Zones. Navigation and anchoring are permitted in the Strict Protection and Multiple Use Zones	No infrastructure is permitted in the Restricted Access Zone. Safety infra-structure anchorages, and docks are allowed in the Strict Protection and Multiple Use Zone. Operational floating accommodation are allowed in the Multiple Use Zone.	Aquaculture does not currently occur, though suitable conditions exist. The NMCA Act prohibits disposal and occupation of lands so commercial enterprises would be prohibited.	Haida traditional use continues in all marine zones. Education, tourism and recreation activities are permitted.	
Scott Islands	Legislation prohibits disturbing, damaging or destroying wildlife or its habitat in the Protected Marine Area or removing wildlife or its habitat.								The mNWA is not zoned, so regulations apply across the entire site, however there are additional spatial restrictions for some activities including a Rockfish Conservation Area and trawl closure.
	Additional prohibitions include dumping and discharging waste, introducing living organisms, overhead flight restrictions and restrictions to access and anchoring.								
	All current fishing activity is exempt from the regulations. Bottom trawling is permitted, though 80% is closed through other measures. New fisheries for forage species are proactively prohibited.	There are no existing leases or prospects identified in the RIAS. Although mining would presumably contravene the general prohibition, it is assumed that permits may be issued as per oil and gas.	There are federal and provincial moratoria in place however according to the RIAS a permit could be issued by the Minister if the moratoria were lifted and if activities were considered not to compromise conservation objectives.	The regulations prohibit dumping however dumping associated with fishing and navigation is exempt if it is done in accordance with the *Fisheries Act* and the *Coastal Fisheries Protection Act* regulations.	The navigation of a vessel in accordance with the *Canada Shipping Act* is permitted. Vessels are prohibited within 300 metres of the island and vessels of over 400 gross tonnes are not permitted to anchor within one nautical mile of the low water mark.	There are three investigative licenses for wind power within the MPA, any proposals would have to go through an Environmental Assessment process and be granted a permit under the regulations.	There is no explicit exemption for aquaculture in the MPA regulations.	The site has cultural and spiritual value for several First Nations. Tourism and recreation are limited. Visitors are prohibited to be within 300 metres of the low water mark of the Islands.	

	Fishing	Mining	Oil and Gas	Dredging and Dumping	Anchoring and Navigation	Infrastructure	Aquaculture	Recreation and Non-extractive Activities	Notes
Anguni-aqvia niqiqyuam	General Oceans Act prohibition on disturbing, damaging, destroying, or removing any living marine organisms or any part of their habitat, or is likely to do so.								The boundary of the MPA was modified to allow for the creation of deepwater harbours. A 2016 joint US-CAN statement designated all Arctic Canadian waters off limits to offshore oil and gas licensing, subject to review every five years.
	Fishing activity is limited. There are no commercial fishing activities at this time, although this may change in the future. Bottom trawling is prohibited throughout the MPA.	The RIAS notes that there are "no economically viable mineral deposits in the MPA" however there is interest in upland areas adjacent to the MPA. There is no exemption for mining.	The RIAS notes that there is no current or expected oil and gas activity in the area. A request to provide an exemption for potential activities was rejected. There is currently a moratorium in effect but it is subject to review every five years, starting in 2021.	There is no explicit prohibition of dumping in the MPA regulations, as was included for earlier *Oceans Act* MPAs. An exemption is provided for navigational dredging to ensure transportation of goods to coastal communities.	Navigation is permitted in accordance with the *Canada Shipping Act* and the *Arctic Waters Pollution Prevention Act*. It is strongly advised that commercial vessels only use community supply routes and avoid certain areas from June 1st through 3rd October.	There are no exemptions for the creation or maintenance of infrastructure. A request to exempt oil and gas infrastructure including cables and pipes was rejected.	There is no explicit exemption for aquaculture in the MPA regulations. Given the remote location of the MPA, aquaculture activity is highly unlikely.	Activities are managed through the submission and approval of an Activity Plan. The area is used by local communities. Recreation and tourism are minimal.	
Tarium Niryutait	General Oceans Act prohibition on disturbing, damaging, destroying, or removing any living marine organisms or any part of their habitat. Prohibition on depositing, discharging, or dumping any substance, or causing any substance to be deposited, discharged, or dumped that is likely to result in the disturbance, damage, destruction or removal of a living marine organism or any part of its habitat.								
	Commercial and recreational fishing in accordance with the *Fisheries Act* is allowed. There are no commercial fishing activities at this time, although such ventures may take place in the future.	According to the RIAS mineral potential is low however there may be potential interest in mining sediments. There is no explicit exemption for this in the MPA regulations. The RIAS notes that mining could only occur if it can be done in a manner that does not violate the general prohibitions.	There is significant oil and gas potential in the MPA including two Significant Discovery Licenses in Okeevik. There are exemptions for oil and gas activities in the Okeevik and Special Management Zone, and geophysical operations and pipeline construction throughout the MPA under certain conditions. There is currently a moratorium in effect but it is subject to review every five years, starting in 2021.	Dumping is explicitly prohibited. Dredging may be carried out under certain conditions if it does not result in, and is not likely to, result in the disturbance, damage, destruction, or removal of a marine mammal.	It is strongly advised that navigation is restricted to community supply routes and from June 1st through October 3rd mariners are asked to avoid the area. An exemption allows navigation outside the community supply routes only to support existing leases and licences in the SMZ.	Oil and gas infrastructure (including pipelines, rigs, etc.) is permitted.	There is no explicit exemption for aquaculture in the MPA regulations. Given the remote location of the MPA, aquaculture activity is highly unlikely.	Activities are managed through the submission and approval of an Activity Plan.	

	Fishing	Mining	Oil and Gas	Dredging and Dumping	Anchoring and Navigation	Infrastructure	Aquaculture	Recreation and Non-extractive Activities	Notes
Tuvaijuittuq	Protection via a ministerial order allows the Minister to freeze the footprint of human activities in the area for up to five years. It is prohibited to disturb, damage, destroy, or remove from the MPA any unique geological or archeological features or any living marine organism or any part of its habitat or is likely to do so.								As an Interim MPA the current prohibitions are not permanent and are only in place for five years. Should the site be designated as MPA there may be changes to the prohibitions and exceptions.
	There is no commercial fishing currently occurring and so it is prohibited under Interim Designation.	No mineral exploration or production is currently occurring within the MPA and so is prohibited under Interim Designation.	No oil and gas activities are currently occurring or planned and so are prohibited with Interim MPA status. There is currently a moratorium in effect but it is subject to review every five years, starting in 2021.	There is no explicit prohibition of dumping in the MPA regulations, as was included for earlier *Oceans Act* MPAs. There are no exemptions for dredging.	Vessel traffic is negligible. Navigation by a foreign national (ship or state) or an entity under the laws of a country other than Canada is exempt.	The laying, use and maintenance of cables and pipelines by a foreign state is exempt from the prohibitions.	There is no explicit exemption for aquaculture in the MPA regulations. Given the remote location of the MPA, aquaculture activity is highly unlikely.	Scientific research and national defence activities are allowed as ongoing activities.	
Tallurutiup Imanga	Tallurutiup Imanga has not been designated and so there are no regulations in place. The below assessment is based on current activities and the NMCA Act prohibitions although exceptions may be provided to the regulations.								The Inuit Impact Benefit Agreement has been completed however Tallurutiup Imanga has not yet been designated. Inuit and the federal government are in the final stages of negotiating plans for the NMCA. Inuit Qauijimajatuqangit or IQ (traditional knowledge) will continue to inform the management of the NMCA.
	The NMCA Act prohibits the disposal or occupation of public lands; exploration for and exploitation of hydrocarbons, minerals, aggregates, and any other inorganic matter; and the disposal of any substance unless authorized by a permit.								
	There is little commercial fishing occurring and bottom trawling does not occur, however new commercial fisheries may be started in future. Fisheries are currently managed in accordance with the *Nunavut Agreement* and *Fisheries Act*. Prohibitions and restrictions of fishing activity would require recommendation from the Minister of Fisheries and Oceans.	There is no mineral extraction currently occurring. Mining and exploitation of minerals or substrates are prohibited within an NMCA unless an exemption is established.	There is currently a federal moratorium on offshore oil and gas exploration and exploitation in Arctic marine waters which is due for review at the end of 2021. Existing licenses within the proposed NMCA were revoked. Oil and gas activities are prohibited within an NMCA.	There is currently no prohibition of dumping or dredging. Dumping is prohibited in an NMCA unless an exemption is established.	Shipping and navigation occur at moderate-to-high levels. Anchoring levels are unknown. Prohibitions and restrictions of navigation and anchoring would require recommendation from the Minister of Transport	There is existing coastal infrastructure throughout the proposed NMCA. Construction, maintenance and decommissioning of public infrastructure may be allowed. The NMCA Act prohibits the disposal or occupation of public lands	Given the remote location of the MPA, any aquaculture activity is highly unlikely. The NMCA Act prohibits the disposal or occupation of public lands.	Tallurutiup Imanga is used by Inuit communities and will continue to be regulated and managed by applicable laws of general application and in accordance with the Nunavut Agreement. Existing tourism is limited but may increase.	

Endnotes

1 O'Leary, et al. 2016. Effective Coverage Targets for Ocean Protection: Effective Targets for Ocean Protection. Conservation Letters 9(6). 398–404. doi.org/10.1111 conl.12247.

2 Sala, et al. 2021. Protecting the global ocean for biodiversity, food and climate. Nature. 10.1038/s41586-021-03371-z

3 Duarte, et al. 2020. Rebuilding marine life. Nature. 580. 39-51. 10.1038/s41586-020-2146-7

4 https://oceanpanel.org/

5 Sala, et al. 2018. Assessing real progress towards effective ocean protection. Marine Policy 91. 11-13. 10.1016/j.marpol.2018.02.004

6 Jessen, et al. 2017. Measuring MPAs in Continental North America: How well protected are the ocean estates of Canada, Mexico and the USA. Front. Mar. Sci. 4:279 10.3389/fmars.2017.00279

7 Grorud-Colvert, et al. 2021. The MPA Guide: A framework to achieve global goals for the ocean. Science. 10.1126/science.abf0861

8 https://www.dfo-mpo.gc.ca/oceans/mpa-zpm/standards-normes-eng.html

9 This excludes Other Effective Area-Based Conservation Measures, Migratory Bird Sanctuaries and provincially designated protected areas that are also counted towards the targets and that therefore should also meet the minimum standards.

10 www.classifympas.org

11 Recognizing that all vessels may anchor within MPAs if it is a matter of safety.

12 Dasgupta. 2021. The Economics of Biodiversity: The Dasgupta Review. Abridged Version. (London: HM Treasury). https://www.gov.uk/government/publications/final-report-the-economics-of-biodiversity-the-dasgupta-review

13 Waldron, et al. 2020. Protecting 30% of the planet for nature: costs, benefits and economic implications. Available at https://www.campaignfornature.org/protecting-30-of-the-planet-for-nature-economic-analysis

14 De Vos, et al. 2014, Estimating the normal background rate of species extinction. Conservation Biology. 10.1111/cobi.12380

15 Day, et al. (eds.). 2019. Guidelines for applying the IUCN protected area management categories to marine protected areas. Second edition. Gland. Switzerland: IUCN.

16 Marshall, Gaines, Warner, Barneche & Bode. 2019. Underestimating the benefits of marine protected areas for the replenishment of fished populations. Front Ecol Environ 2019; 17(7): 407– 413, 10.1002/fee.2075

17 Baetscher, et al. 2019. Dispersal of a nearshore marine fish connects marine reserves and adjacent fished areas along an open coast. Mol Ecol. 2019; 28: 1611– 1623. https://doi.org/10.1111/mec.15044

18 Brander, et al. 2015. The benefits to people of expanding Marine Protected Areas. Institute for Environmental Studies (IVM), VU University Amsterdam & World Wildlife Fund (WWF)

19 Gill, et al. 2017. Capacity shortfalls hinder the performance of marine protected areas globally. Nature 543, 665–669 (2017). 10.1038/nature21708

20 Edgar, et al. 2014. Global conservation outcomes depend on marine protected areas with five key features. Nature, 506(7487), 216–220. 10.1038/nature13022

21 Devillers, et al. 2014. Reinventing residual reserves in the sea: are we favouring ease of establishment over need for protection? Aquatic Conserv: Mar. Freshw. Ecosyst. 10.1002/aqc.2445

22 https://www.cbd.int/aichi-targets/target/11

23 https://www.canada.ca/en/fisheries-oceans/news/2020/07/canada-joins-global-ocean-alliance-advocates-for-protecting-30-per-cent-of-the-worlds-ocean-by-2030.html

24 https://www.canada.ca/en/environment-climate-change/news/2020/09/canada-joins-the-high-ambition-coalition-for-nature-and-people.html

25 https://www.leaderspledgefornature.org/

26 Environics. 2016. Public Opinion on Marine Protected Areas. Poll commissioned by WWF-Canada. http://awsassets.wwf.ca/downloads/wwf_environics_report_mar26.pdf?_ga=2.68735316.451442461.1496678703-306732889.1491409766

27 Regulatory Impact Assessment Statements (RIAS), is a summary or public accounting of a proposed MPA. It describes what the government will deliver on, what consultations have taken place, the opinions expressed during those consultations, and the costs and benefits of the site designation.

28 Canada has designated a number of fishing closures as Other Effective Area Based Conservation Measures and is counting these sites towards the marine conservation targets. https://www.dfo-mpo.gc.ca/oceans/oecm-amcepz/index-eng.html

29 https://laws-lois.justice.gc.ca/eng/regulations/SOR-2018-119/index.html

30 https://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1609/index.html

31 https://www.cnlopb.ca/news/nr11042020/

32 Baum and Worm. 2009. Cascading top-down effects of changing oceanic predator abundances. Journal of Animal Ecology. https://doi.org/10.1111/j.1365-2656.2009.01531.x

33 Kuparinen, A., Boit, A., Valdovinos, F. et al. 2016. Fishing-induced life-history changes degrade and destabilize harvested ecosystems. Sci Rep 6, 22245. https://doi.org/10.1038/srep22245

34 https://search.open.canada.ca/en/od/?search_text=trawl+survey#

35 https://www.dfo-mpo.gc.ca/oceans/documents/mpa-zpm/gully/Gully-RIAS.pdf

36 https://www.dfo-mpo.gc.ca/oceans/oecm-amcepz/refuges/sfa-zpp-eng.html

37 Chin & Hari. 2020. Predicting the impacts of mining of deep sea polymetallic nodules in the Pacific Ocean: A review of Scientific literature, Deep Sea Mining Campaign and MiningWatch Canada, 52 pages

38 https://www.canlii.org/en/pe/laws/regu/pei-reg-ec323-90/latest/pei-reg-ec323-90.html

39 https://www.dfo-mpo.gc.ca/oceans/documents/mpa-zpm/musquash/Musquash-RIAS.pdf

40 Weller, Ivashchenko, Tsidulko, Burdin, & Brownell, Jr. 2002. Influence of seismic surveys on western gray whales off Sakhalin Island, Russia in 2001. Publications, Agencies and Staff of the U.S. Department of Commerce.

41 Weilgart, L .2013. A review of the impacts of seismic airgun surveys on marine life. Submitted to the CBD Expert Workshop on Underwater Noise and its Impacts on Marine and Coastal Biodiversity, 25-27 February 2014, London, UK. Available at: http://www.cbd.int/ doc/?meeting=MCBEM-2014-01

42 Gordon, et al. 2003. A Review of The Effects of Seismic Surveys on Marine Mammals. Marine Technology Society Journal. 37. 16-34. 10.4031/002533203787536998.

43 https://e360.yale.edu/features/twenty_years_later_impacts___of_the_exxon_valdez_linger

44 https://www.dfo-mpo.gc.ca/campaign-campagne/bes-seb/index-eng.html

45 https://laws-lois.justice.gc.ca/eng/regulations/SOR-2004-112/page-1.html#h-708820

46 Scheifele, Andrew, Cooper & Darre. 2004. Indication of a Lombard vocal response in the St. Lawrence River beluga. Journal of the Acoustic Society of America 117(3): 1486-1492.

47 Schwemmer, Mendel, Sonntag, Dierschke & St. Garthe. 2011. Effects of ship traffic on seabirds in offshore waters: implications for marine conservation and spatial planning. Ecological Applications 21(5):1851-1860

48 WWF. 2017. Shipping Through Sea Ice: Impacts on Marine Habitats and Best Practices. Available from https://www.wcel.org/sites/default/files/publications/wwf-mpa-4-impacts-marine-habitat-final.pdf

49 https://www.haidagwaiiobserver.com/news/man-hooks-massive-fine-fishing-in-mpa-of-haida-gwaii/

50 https://www.dfo-mpo.gc.ca/oceans/publications/tuvaijuittuq/designation/index-eng.html

51 VARD Marine Inc. 2018. Canadian Arctic Greywater Report: Estimates, forecasts and treatment technologies. WWF Canada.

52 McDermott, Meng, McDonald & Costello. 2019. The blue paradox: Preemptive overfishing in marine reserves. PNAS. 116 (12) 5319-5325. 10.1073/pnas.1802862115

53 https://www.stand.earth/publication/protect-arctic/canadian-shipping/regulating-west-coast-cruise-industry-canada-low-water

54 https://www.epa.gov/vessels-marinas-and-ports/factsheet-california-no-discharge-zone-prohibiting-vessel-sewage-all

55 Recognizing that all vessels may anchor within MPAs if it is a matter of safety.

56 Allen, Yurk, Vagle, Pilkington & Canessa. 2018. The Underwater acoustic environment at SGaan Kinghlas-Bowie Seamount Marine Protected Area: Characterizing vessel traffic and associated noise using satellite AIS and acoustic datasets. Marine Pollution Bulletin, 128: 82-88. 10.1016/j.marpolbul.2018.01.014.

57 https://gazette.gc.ca/rp-pr/p2/2018/2018-06-27/html/sor-dors119-eng.html

58 https://waves-vagues.dfo-mpo.gc.ca/Library/361101.pdf

59 Recognizing that all vessels may anchor within MPAs if it is a matter of safety.

60 Grant et al. 2019. Effect of suspended sediments on the pumping rates of three species of glass sponge in situ. Mar Ecol Prog Ser 615. 10.3354/meps12939

61 https://cpawsbc.org/bcs-glass-sponge-reefs-need-a-bigger-buffer/

About CPAWS

CPAWS is Canada's only charity dedicated to the protection of public land, freshwater and ocean with a strong national and regional presence across the country. We are Canada's leader in conservation with more than 50 years of success based on our expertise, public education and advocacy, relationships and local knowledge. We are a credible, trusted, knowledge-based, nationally coordinated, collaborative organization, focused on conserving nature to respond to the dual crises of accelerated biodiversity loss and climate change.

Our mission

CPAWS advocates for the effective, long-term protection of ecologically- and culturally-significant land, freshwater and ocean areas in Canada. Working in a way that respects the sovereignty and leadership of Indigenous nations, we achieve our mission through knowledge-based advocacy, and public education and engagement, underpinned by collaboration and partnership.

Our vision

At least half of land, freshwater and ocean in Canada is permanently protected to sustain nature and people for current and future generations.

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We gratefully acknowledge contributions and support from the following people and organizations: Jennifer Brown, James Stillwell, Sandra Schwartz, Steve Moran, Tracy Walden, Alison Woodley, Jennifer Scott, Anika Hazra, Benjamin Filliol (CPAWS National); Chris Miller, Reanne Harvey (CPAWS Nova Scotia); Roberta Clowater, Anika Smithson, Danielle Hak (CPAWS New Brunswick); Tanya Edwards, Mikaila Bickford (CPAWS Newfoundland and Labrador); Joannie Boire, Véronique Bussières, Marie Cadieux, Charlène Daubenfeld (Snap Québec); Anna Baggio, Megan Chen (CPAWS Wildlands League); Ron Thiessen, Riley Chervinski (CPAWS Manitoba); Ross Jameson, Carlo Acuña, Jacob Chila (CPAWS British Columbia); Susanna Fuller (Oceans North); Stephanie Hewson (West Coast Environmental Law); and Sarah Saunders (WWF Canada); Kirsten Grorud-Colvert and Jenna Sullivan Stack (Oregon State University); and Beth Pike (Marine Conservation Institute).

Spatial analysis, mapping and data visualizations by Rithikha Rajamohan
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Front cover illustration: Terra Firma and Shutterstock | Back cover photo: Pawel Nolbert

Graphic design: Roger Handling, Terra Firma Digital Arts