

Sustaining Canadian marine biodiversity: Policy and statutory progress

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Abstract

A 2012 Expert Panel Report on marine biodiversity by the Royal Society of Canada (RSC) concluded that Canada faced significant challenges in achieving sustainable fisheries, regulating aquaculture, and accounting for climate change. Relative to many countries, progress by Canada in fulfilling international obligations to sustain biodiversity was deemed poor. To track progress by Canada since 2012, the RSC struck a committee to track policy and statutory developments on matters pertaining to marine biodiversity and to identify policy challenges, and leading options for implementation that lie ahead. The report by the Policy Briefing Committee is presented here. It concluded that Canada has made moderate to good progress in some areas, such as prioritization of oceans stewardship and strengthening of the evidentiary use of science in decision-making. Key statutes were strengthened through amendments, including requirements to rebuild depleted fisheries (*Fisheries Act*) and new means of creating marine protected areas (*Oceans Act*) that allowed Canada to exceed its international obligation to protect 10% of coastal and marine areas by 2020. Public release of mandate letters has strengthened ministerial accountability. However, little or no progress has been made in reducing regulatory conflict with Fisheries and Oceans Canada (DFO), decreasing ministerial discretion under the *Fisheries Act*, clarifying the role of science in sustainable fisheries policy, and accounting for climate change. Five future policy challenges are identified: (1) Ensure climate change impacts and projections are incorporated into ocean-related decision making and planning processes; (2) Resolve DFO's regulatory conflict to conserve and exploit biodiversity; (3) Limit ministerial discretionary power in fisheries management decisions; (4) Clarify ambiguities in how the Precautionary Approach is applied in sustainable fisheries policy; and (5) Advance and implement marine spatial planning. Since 2012, there has been progress in recovering and sustaining the health of Canada's oceans. Failure to further strengthen biodiversity conservation threatens the capacity of Canada's oceans to provide ecosystem services that contribute to the resilience of marine life and the well-being of humankind. Unprecedented and enduring changes in the ocean caused by climate change have made the achievement of meaningful progress all the more urgent.

Introduction

The coastal marine environment constitutes a biological, geochemical, and physical milieu without which life would not exist. Phytoplankton and other microbes, the base of food webs, transfer mass

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Note: This paper presents an accounting of actions taken by the Canadian federal government in response to recommendations made by a 2012 Royal Society of Canada Expert Panel Report. It underwent extensive internal review by the Royal Society of Canada and external review by the Editor-in-Chief of FACETS.

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and energy to higher trophic-level organisms, many of which play key roles in marine ecosystems, provide important sources of human protein, and contribute to socio-economic health. Canada's oceans embrace the world's longest coastline, encompassing territorial seas more than twice the size of India. The oceans have long provided habitat for species of traditional and cultural significance to Indigenous peoples. Sustainably exploited and farmed seafood have potential to provide long-term, secure access to food. The challenge lies in recovering and maintaining healthy ocean ecosystems to fully realize this potential. Canada has a chequered history in doing so.

In 2012, an Expert Panel established by the Royal Society of Canada reported its findings on the impacts of fisheries, aquaculture, and climate change on Canada's ability to sustain marine biodiversity. The mandate of the Expert Panel on *Sustaining Canada's Marine Biodiversity: Responding to the Challenges Posed by Climate Change, Fisheries, and Aquaculture* was to prepare expert assessments of: (i) past and projected trends in Canada's ocean environments and marine biodiversity; (ii) the causes and projected consequences of these trends for biodiversity; and (iii) the extent to which Canada was fulfilling its national and international obligations to sustain marine biodiversity. The Panel was also tasked with identifying new approaches, measures, and research initiatives to promote the sustainability of Canadian marine biodiversity.

The Panel concluded that Canada faced significant challenges in achieving fisheries sustainability, regulating environmentally responsible aquaculture, and adapting to climate change. In terms of policy and statute implementation, Canada's progress had not been substantive relative to that achieved by others, such as the U.S. and the European Union. The Expert Panel was not alone in its conclusions. Since 2012, the Commissioner of the Environment and Sustainable Development (CESD) has been critical of Canada's efforts to implement existing policies, regulations, and statutes that explicitly or implicitly concern marine biodiversity. CESD reports include audits pertaining to marine protected areas ([Office of the Auditor General of Canada 2012](#)), sustainability of fish stocks ([Office of the Auditor General of Canada 2016](#)), and aquaculture ([Office of the Auditor General of Canada 2018](#)).

The challenges Canada faces today remain daunting. Less than 1 in 3 of Canada's major fish stocks (29.4%) is considered "healthy" ([Oceana Canada 2019](#)). There are deficiencies in how risks associated with salmon farming are managed and mitigated ([Office of the Auditor General of Canada 2018](#)). Indigenous traditional knowledge and co-governance capabilities have yet to be fully realized in ocean-related decision making. Recently, the Intergovernmental Panel on Climate Change (IPCC) highlighted the "urgency of prioritizing timely, ambitious, and coordinated action to address unprecedented and enduring changes in the ocean" ([IPCC 2019](#)).

In 2019, the Royal Society of Canada (RSC) established a Policy Briefing Committee tasked with tracking public-policy developments since the RSC's 2012 Expert Panel Report and to identify policy challenges, and leading options for implementation, that lie ahead. As the members of this Policy Briefing Committee, we present the committee's findings.

We begin with a brief impact assessment of the 2012 Expert Panel Report. This is followed by a detailed treatment of policy and statutory developments from 2012 through 2019 that concentrates on six of the Expert Panel's recommendations and associated key actions. A "traffic-light" approach is also used to evaluate progress on each recommendation and key action. The present study ends with a consideration of future policy challenges and suggested initiatives for their implementation.

The 2012 Expert Panel Report: Assessing impact

The RSC Expert Panel Report has been cited almost 100 times from all sources, excluding traditional media reports. Regarding non-peer reviewed scientific publications, the report has been cited at least 31 times by a combination of NGOs, Industry-Affiliated Bodies, Government Agencies, and Academia ([Table 1](#)). In addition to the report itself, three peer-reviewed publications, detailing

Table 1. Citations of the 2012 RSC Expert Panel Report on Sustaining Marine Biodiversity by multiple sources.

| Year | Title | Source |
|------|---|---|
| 2019 | Bill C-55: Stronger Legal Protection for Marine Space in Canada | NGO (Collaboration effort: <i>CPAWS, David Suzuki Foundation, Ecology Action Centre, Oceans North, WWF Canada, West Coast Environmental Law 2019, SeaBlue Canada 2019</i>) |
| 2019 | Farming the Sea, a False Solution to a Real Problem: Critical Reflections on Canada's Aquaculture Regulations | Academia (<i>Lee and Cloutier de Repentigny 2018</i>) |
| 2019 | Wild Fish Trapped: Incidental Catch in the Salmon Farming Industry | NGO (<i>Watershed Watch Salmon Society 2019</i>) |
| 2019 | Ocean Laws (Home Page) | NGO (<i>West Coast Environmental Law 2019</i>) |
| 2017 | Fishery Audit 2017: Unlocking Canada's Potential for Abundant Oceans | NGO (<i>Oceana Canada 2017</i>) |
| 2017 | Speaking for the Salmon | NGO (<i>Watershed Watch Salmon Society 2017</i>) |
| 2016 | Canada's Marine Coasts in a Changing Climate | Government of Canada 2016 |
| 2016 | The Rise and Biodiversity Relevance of Private Governance in Canada's Fisheries and Aquaculture Sectors | NGO (<i>IUCN Commission on Environmental, Economic and Social Policy 2016</i>) |
| 2016 | Creating Modern Safeguards in the <i>Fisheries Act</i> to Rebuild Fish Stocks in Canada | NGO (<i>Oceana Canada 2016</i>) |
| 2016 | Sustainability of Canadian fisheries requires bold political leadership | Policy Forum (<i>Policy Options 2016</i>) |
| 2015 | Seal Range State Policy and Management Review | NGO (<i>IUCN 2015</i>) |
| 2014 | Bottom-Up Regulation of Capelin, a Keystone Forage Species | Academia/Government (Cognitive and Behavioural Ecology Programme, Memorial University; NAFC, Fisheries & Oceans Canada) (<i>Buren et al. 2014</i>) |
| 2014 | Appendix D: Literature Reviews for Impacts of Climate Change on Columbia River Salmon | Government (<i>NOAA Fisheries 2014</i>) |
| 2014 | Assessing the Impact of Human Activities on British Columbia's Estuaries | Academia (School of Environment and Management, Royal Roads University) (<i>Robb 2014</i>) |
| 2013 | Aquaculture: Annotated Bibliography of the Conservation Issues of Open-pen Finfish Aquaculture | NGO (<i>Canadian Wildlife Federation 2013</i>) |
| 2013 | Canadian Mining Innovation Council Environmental Analysis of the Mining Industry in Canada | Industry (Prepared by <i>Hatch Ltd. 2013</i> and Contributing Authors for the Canadian Mining Innovation Council) |
| 2013 | Gutting Canada's <i>Fisheries Act</i> : No Fishery, No Fish Habitat Protection | Academia (<i>Hutchings and Post 2013</i>) |
| 2013 | Species at Risk: State of the Gulf of Maine Report | Government (<i>Gulf of Maine Council on the Marine Environment 2013</i> ; Fisheries & Oceans Canada) |
| 2013 | An evaluation of Grieg Seafood BC and Marine Harvest Canada's marine netpen salmon operations in British Columbia | NGO (<i>Seafood for the Future 2013</i>) |
| 2012 | Finfish Aquaculture Update | NGO (<i>Friends of Blue Hill Bay 2012</i>) |
| 2012 | Are marine protected areas a solution for protecting Canada's marine life? | NGO (<i>WWF Canada</i>) (<i>Dumbrille 2012</i>) |
| 2012 | As ice melts in Far North, opportunities abound to advance Canada's oceanic laws | Science Media (<i>Phys.org Social Science and Humanities Research Centre</i>) (<i>Phys Org 2012</i>) |
| 2012 | 40 Priority Research Questions for Ocean Science in Canada | Academia (<i>Council of Canadian Academies 2012</i>) |
| 2012 | Sustaining Canada's Marine Biodiversity, Fisheries and Communities | Media (<i>Newfoundland & Labrador Environment Network 2012</i>) |

(continued)

Table 1. (concluded)

| Year | Title | Source |
|------|---|--|
| 2012 | Evaluating the role and designation of critical habitat for conserving Canadian marine species at risk: a decision framework | Academia (Ryan 2012) |
| 2012 | Assessing the Viability of the <i>Species at Risk Act</i> in Managing Commercial Exploitation and Recovery of Threatened and Endangered Marine Fish in Canada | Academia (Druce 2007) |
| 2012 | Letter: Canadian Society for Ecology and Evolution to Minister, Fisheries and Oceans | NGO (Mid-Canada American Fisheries Society 2012) |
| 2012 | The Sustainable Management of Grey Seal Populations: A Path Toward the Recovery of Cod and Other Groundfish Stocks | Government (Report of the Standing Senate Committee on Fisheries and Oceans 2012) |
| 2012 | Precautionary Approach | NGO (Loewen 2012) |
| 2012 | Summary of Scientific Papers on Impacts of Open Net Pen Farming on Wild Populations | NGO (Medway River Salmon Association 2012) |
| 2012 | Climate Change, Oceans and Fisheries | Media/NGO (Work and Climate Change Report, York University W3 Project) (Work and Climate Change Report 2012) |

different aspects of the Expert Panel Report, were published in the journal *Environmental Reviews*. Their citation details, according to Google Scholar, are as follows:

Hutchings JA, Côté IM, Dodson JJ, Fleming IA, Jennings S, Mantua NJ, Peterman RM, Riddell BE, Weaver AJ (2012) Climate change, fisheries, and aquaculture: trends and consequences for Canadian marine biodiversity. *Env. Rev.* 20: 220–311. **Citations: 24**

Hutchings JA, Côté IM, Dodson JJ, Fleming IA, Jennings S, Mantua NJ, Peterman RM, Riddell BE, Weaver AJ, VanderZwaag DL (2012) Is Canada fulfilling its obligations to sustain marine biodiversity? *Env. Rev.* 20: 353–361. **Citations: 23**

VanderZwaag DL, Hutchings JA, Jennings S, Peterman RM (2012) Canada's international & national commitments to sustain marine biodiversity. *Env. Rev.* 20: 312–352. **Citations: 14**

A specific perspective

We conclude that the RSC Expert Panel Report has had meaningful influence by providing an objective foundation for strengthening Canadian commitments to sustain marine biodiversity. The campaigns of several NGOs have been wholly consistent with, and in some cases explicitly influenced by, the Report's recommendations. Notwithstanding the challenge in attributing cause to effect, since 2012 there have been significant changes to Canadian law (such as the *Fisheries Act* and *Oceans Act*) and a strengthening of Canada's commitments to sustain marine biodiversity (for example, by exceeding the target for marine protected areas under the Convention of Biological Diversity). NGOs whose efforts were influential in this regard include *Canadian Parks and Wilderness Society*, *David Suzuki Foundation*, *Ecology Action Centre*, *Oceana Canada*, *Oceans North*, *West Coast Environmental Law*, and *WWF Canada*.

To provide one specific example of impact in this regard, the 2012 Expert Panel Report influenced the establishment (2015) of *Oceana Canada*, an NGO with primary interest in policy and statutory development in sustainable fisheries and marine conservation. With respect to impact of the Expert Panel Report, *Oceana Canada* has stated ([Oceana Canada 2019](#)):

“In the course of the feasibility study [to determine whether Oceana should establish in Canada], Oceana staff carried out interviews with over 60 scientists, government officials, conservationists, and fishing industry representatives. In each of those interviews, we asked for comments on the Royal Society report. We found overwhelming agreement that the report represented an accurate diagnosis of the problems with Canada’s fisheries management, as well as providing prescriptions for fixing them. Ultimately, our final feasibility study (and the funding proposals based upon it) included abundant references to the report.”

Tracking policy and statutory progress

Assessment of policy and statutory development since the Expert Panel Report begins with a summary “traffic-light” evaluation of progress made on the 2012 Report’s recommendations and key actions for implementation. Detailed descriptions of the PBC’s findings follow in [Table 2](#).

Table 2. Assessment of progress on recommendations and key actions identified in the 2012 RSC Expert Panel Report.

| RECOMMENDATION OR POLICY-RELATED KEY ACTION | ASSESSMENT OF PROGRESS |
|---|------------------------|
| NO TO LITTLE PROGRESS | |
| LITTLE TO MODERATE PROGRESS | |
| MODERATE TO GOOD PROGRESS | |
| RECOMMENDATION 1: That the Government of Canada identify international leadership in oceans stewardship and biodiversity conservation as a top government priority. | |
| KEY ACTION 1.1: The Government of Canada should fully implement existing statutory and policy commitments to sustain marine biodiversity. | |
| KEY ACTION 1.2: The Government of Canada should enhance transboundary and international governance arrangements by extending integrated management planning efforts across national maritime boundaries. | |
| KEY ACTION 1.3: The Government of Canada should increase Canada’s formal membership to international agreements that pertain to the sustaining of marine biodiversity, such as the Convention on the Conservation of Migratory Species of Wild Animals. | |
| KEY ACTION 1.4: The Government of Canada should support research initiatives to strengthen scientific advice and ensure renewal of retiring scientific and managerial staff who have expertise in decision-making in the presence of complexity, trade-offs, uncertainties, and risks. | |
| KEY ACTION 1.5: The Government of Canada should fully support the provision and implementation of a management framework that maximizes opportunities for fisheries to achieve third-party certification of sustainability. | |
| KEY ACTION 1.6: The Auditor General of Canada could undertake a full financial, statutory, and policy audit of Canada’s progress in meeting its international marine biodiversity obligations. | |
| RECOMMENDATION 2: That the Government of Canada resolve regulatory conflicts of interest affecting Canada’s progress in fulfilling obligations to sustain marine biodiversity. | |
| KEY ACTION 2.1: The Government of Canada should develop processes and, if necessary, amend institutional structures to limit or eliminate real and perceived regulatory conflicts of interest. | |
| KEY ACTION 2.2: The Government of Canada should develop processes and, if necessary, amend institutional structures to ensure that Ministers are fully and transparently accountable for policy commitments to the use and conservation of marine biodiversity. | |

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Table 2. (continued)

| RECOMMENDATION OR POLICY-RELATED KEY ACTION | ASSESSMENT OF PROGRESS |
|---|------------------------|
| RECOMMENDATION 3: That the Government of Canada reduce the discretionary power in fisheries management decisions exercised by the Minister of Fisheries and Oceans. | |
| KEY ACTION 3.1: The Government of Canada should enact prescriptive legislation containing primary objectives to: (i) prevent overfishing; (ii) rebuild depleted fish stocks; (iii) formalize the explicit use of reference points and harvest control rules; and (iv) ensure transparency and accountability in fisheries management plans, including those relating to aquaculture. | |
| KEY ACTION 3.2: The Government of Canada should consider the establishment of independent, arms-length advisory or decision-making bodies on matters pertaining to the use and conservation of marine biodiversity, including catch allocations, licensing, and environmental impact assessments. | |
| KEY ACTION 3.3: The Prime Minister (PM) should use a mandate letter (which outlines the PM's expectations and policy goals) to increase ministerial accountability within DFO; the letter could be used to provide the Minister of Fisheries and Oceans a mandate to respond to the Expert Panel's recommendations; the mandate letter should be publicly available. | |
| RECOMMENDATION 4: That Fisheries and Oceans Canada (DFO) rapidly increase its rate of statutory and policy implementation. | |
| KEY ACTION 4.1: DFO should fully implement the <i>Oceans Act</i> to: (i) identify biodiversity hotspots and vulnerable biological habitats; (ii) establish a comprehensive and biologically meaningful network of MPAs; and (iii) develop marine spatial planning with clear geographical priorities, explicit timelines, and transparent measures for public reporting. | |
| KEY ACTION 4.2: DFO should fully implement the <i>Species at Risk Act</i> for marine fishes by including endangered and threatened species on the national legal list and by affording them the full benefits of recovery strategies, including the identification of recovery targets, rebuilding timelines, and (when possible) limited directed harvests. | |
| KEY ACTION 4.3: DFO should fully implement existing policies on marine biodiversity use and conservation, such as those included within the Sustainable Fisheries Framework. | |
| RECOMMENDATION 5: That Canada implement statutory renewal to fulfil national and international commitments to sustain marine biodiversity. | |
| KEY ACTION 5.1: Draft and enact a modernized <i>Fisheries Act</i> , or a new statute, that: (i) identifies full implementation of the precautionary approach as an over-arching objective; (ii) provides legislative requirements and guidance on fully implementing the Sustainable Fisheries Framework; and (iii) identifies conservation of biodiversity as a core consideration in the development of fisheries management plans. | |
| KEY ACTION 5.2: Draft and enact federal aquaculture legislation that specifies requirements and guidance on national objectives and procedures for all aquaculture operations and that requires a principled approach to aquaculture operations, to ensure the protection of biodiversity. | |
| KEY ACTION 5.3: Consider enacting comprehensive biodiversity legislation similar to that existing in Australia and Norway to set legally binding requirements for biodiversity protection. | |
| KEY ACTION 5.4: Consider amending the <i>Oceans Act</i> to clarify integrated management procedures and responsibilities and to provide a firm legal foundation for implementing completed management plans. | |
| KEY ACTION 5.5: Strengthen the <i>Species at Risk Act</i> through key amendments that would: (i) establish a transparent evaluation and consultation process for decisions not to list a species at risk, including external review of supporting listing-decision analyses; (ii) clarify the procedure and process for developing recovery strategies and Key Action plans; and (iii) restrict discretion to exempt activities from SARA's prohibitions and incidental permitting requirements. | |

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Table 2. (concluded)

| RECOMMENDATION OR POLICY-RELATED KEY ACTION | ASSESSMENT OF PROGRESS |
|---|------------------------|
| RECOMMENDATION 6: That the Government of Canada establish national operational objectives, indicators, and targets for marine biodiversity. | |
| KEY ACTION 6.1: The Government of Canada should establish operational objectives that relate to existing commitments to biodiversity conservation and formally integrate them in oceans and fisheries management; highest priority should be assigned to objectives pertaining to those impacts most likely to compromise national and international commitments to sustain marine biodiversity. | |
| KEY ACTION 6.2: DFO should establish biodiversity indicators and targets to assess progress towards meeting operational objectives, and annually report the status and trends of marine biodiversity (using indicators), as well as national progress in attaining policy objectives. | |

Recommendation 1. That the Government of Canada (GoC) identify international leadership in oceans stewardship and biodiversity conservation as a top government priority

PROGRESS:

- THE GOVERNMENT OF CANADA HAS MADE GOOD PROGRESS IN FULFILLING THIS RECOMMENDATION.
- PROGRESS IS REFLECTED BY (I) POLICY AND STATUTORY RENEWAL, (II) PUBLIC RELEASE OF MANDATE LETTERS, (III) NEW INVESTMENTS IN SCIENCE, AND (IV) MULTIPLE AUDITS UNDER THE AUSPICES OF THE OFFICE OF THE AUDITOR GENERAL OF CANADA.

Summary of the evidence

- 1.1. **Public declarations by government:** The PBC concludes that the most recent GoC (2015–2019) identified leadership in oceans stewardship and biodiversity conservation as a top priority. One example is in the Liberals' 2015 electoral platform which included a section entitled "Real Change: Protecting Our Oceans" ([Liberal Party of Canada 2020](#)):

“[T]he health of [our oceans] . . . is critical to safeguarding our environment and growing our economy. Our plan will help fish stocks recover, support eco-tourism, protect coastlines from erosion, ensure ecological integrity and protect species at risk. We will restore Canada’s reputation as a leader in ocean science, strengthen our laws and regulations, and give communities more say in how we manage our oceans.”
- 1.2. To achieve these objectives, the Liberals identified five specific initiatives: (i) meet Canada’s international commitment to protect marine and coastal areas; (ii) invest in ocean science; (iii) strengthen Canada’s laws; (iv) encourage community engagement; and (v) protect the marine environment from oil spills ([Liberal Party of Canada 2020](#)).
- 1.3. The 2015 mandate letter from the Prime Minister to the Minister of Fisheries, Oceans, and the Canadian Coast Guard [hereafter, Minister of Fisheries and Oceans] ([Minister of Fisheries and Oceans 2015](#)) included several priorities that would address the Expert Panel’s Recommendation 1. These included commitments to: (i) increase the proportion of Canada’s protected marine and coastal areas to 10% by 2020; (ii) restore funding to federal ocean science and monitoring programmes; (iii) use scientific evidence and the precautionary principle in fisheries and ecosystem management decisions; and (iv) examine the implications of climate change on Arctic marine ecosystems. These priorities were echoed in the 2016 mandate letter.

- 1.4. The 2018 mandate letter to the minister ([Trudeau 2018](#)) included the following priorities: (i) implement and further develop the Oceans Protection Plan to protect Canada's coastline (the world's longest) and marine species at risk; (ii) reform the *Fisheries Act* to restore lost protections and incorporate modern safeguards to protect fish and fish habitat; (iii) achieve protection of at least 10% of coastal and marine areas by 2020; and (iv) use scientific evidence, traditional Indigenous knowledge, and the precautionary principle, and take into account climate change, when making decisions affecting fish stocks and ecosystem management.
- 1.5. **Expert Panel Key Action 1.1—The GoC should fully implement existing statutory and policy commitments to sustain marine biodiversity:** When the RSC Report was released in 2012, the most visible of Canada's international commitments to sustain biodiversity were embodied in the Aichi Biodiversity Targets, developed under the auspices of the CBD (Convention on Biological Diversity). Among these ([Convention on Biological Diversity 2018a](#)), only Target 11 specified a quantitative commitment pertaining to oceans; Canada committed to conserve, by 2020, at least 10% of coastal and marine areas through the establishment of well-connected systems of protected areas. As of 1 August 2019, Canada had protected 13.82% of its marine and coastal environment (meeting its commitment ahead of schedule), an almost 20-fold increase from the 0.8% that had been protected in 2012 ([Canadian Parks and Wilderness Society 2019](#)).
- 1.6. Amendments to the *Oceans Act* in May 2019 ([Justice Laws Website 2019](#)) allowed for interim protections, maintenance of ecological integrity, and the establishment of networks of protected areas. To meet the 2020 deadline for Aichi Biodiversity Target 11, Canada established guidance on "other effective conservation measures" ([Fisheries and Oceans Canada 2017](#)) so that it could include existing fisheries area closures and establish new ones more expeditiously than the processes required for Marine Protected Areas (MPAs) under the *Oceans Act* or National Marine Conservation Areas.
- 1.7. Canada also used guidance provided under the Sensitive Benthic Areas Policy, part of its Sustainable Fisheries Framework, to protect large areas of cold-water coral and sponge habitat, with a particular focus on the eastern Arctic and Atlantic. Following the 2018 CBD Conference of the Parties (COP), Canada committed to upgrading its domestic guidance in these areas to be in line with that agreed internationally ([Convention on Biological Diversity 2018b](#)).
- 1.8. Canada announced prohibitions on bottom trawling, mining, dumping, and oil and gas extraction in areas protected under the *Oceans Act* and *National Marine Conservation Areas Act*, in accordance with recommendations of an expert panel ([Fisheries and Oceans Canada 2019f](#)). Canada is currently updating policies under the *National Marine Conservation Areas Act* to provide clarity on protection measures and monitoring in National Marine Conservation Areas ([Government of Canada 2019a](#)).
- 1.9. The recently (June 2019) amended *Fisheries Act* restored lost protections for fish and fish habitat, including prohibitions on habitat alteration, damage, and destruction. Canada initiated a \$75 M Coastal Restoration Fund aimed at tangible measures to restore fish habitat on all three coasts ([Fisheries and Oceans Canada 2019a](#)). The revised Act requires consideration of Indigenous traditional knowledge in fish-habitat protection decisions.
- 2.0. **Expert Panel Key Action 1.2—The GoC should enhance transboundary and international governance arrangements by extending integrated management planning efforts across national maritime boundaries:** Canada played a leading role from both a scientific and management perspective in its engagement as a Contracting Party with the Northwest Atlantic Fisheries Organization (NAFO) to close ~15% of the fishable area within the NAFO Regulatory Area to bottom fishing activities as of 2016 ([NAFO 2019](#)). NAFO closed the last mid-water trawl fishery on seamounts in 2019 ([NAFO 2019](#)). These bottom fishery closures have reduced the threat to vulnerable coral and sponge communities as well as seamount areas ([NAFO 2020](#)).
- 2.1. Canada's extended continental shelf reaches into the NAFO Regulatory Area, and currently there is active oil and gas activity within some of the NAFO closed areas, demonstrating a lack of a comprehensive approach to integrated management where biodiversity protections

associated with one activity are not extended to others. Canada is currently undergoing a regional environmental impact assessment for oil and gas in this region. It is unclear what the consequences of this assessment will be for oil and gas development.

- 2.2. In 2016, Canada announced the protection of Georges and Corsair Canyons (~400 km southwest of Halifax) from bottom fishing activity, complementing protections on the U.S. portion of Georges Bank ([Fisheries and Oceans Canada 2018](#)).
- 2.3. In December 2016, Canada became a signatory to the Hamilton Declaration which established a Commission devoted to conserving biodiversity in the Sargasso Sea ([Sargasso Sea Commission 2014](#); sargassoseacommission.org/about-the-commission/hamilton-declaration).
- 2.4. Canada provided leadership in negotiating the Central Arctic Ocean (CAO) Fisheries Agreement, which was signed in October 2018 ([Fisheries and Oceans Canada 2019e](#)). Canada hosted the first science meeting pursuant to the Agreement in May 2019. The Agreement will prohibit commercial fisheries for up to 16 years and until more scientific information is available. Commercial fishing will only be allowed after conservation and management measures have been adopted by one or more regional or sub-regional fisheries management organizations or arrangements, or pursuant to other interim measures which might be adopted under the Agreement.
- 2.5. Canada advocated for Indigenous knowledge to be included in the CAO agreement with regard to science advice ([Fisheries and Oceans Canada 2019e](#)).
- 2.6. **Expert Panel Key Action 1.3—The GoC should increase Canada’s formal membership to international agreements that pertain to the sustaining of marine biodiversity, such as the Convention on the Conservation of Migratory Species of Wild Animals:** Canada is still not a party to the Convention on the Conservation of Migratory Species of Wild Animals nor to any of its sub-agreements and Memorandum of Understandings (MOUs), such as the MOU on the Conservation of Sharks. Canada is not yet a party to the Inter-American Convention on the Protection and Conservation of Sea Turtles.
- 2.7. Canada has enhanced its engagement in the negotiations for a new high seas treaty to protect biodiversity, and deal explicitly with MPAs, environmental impact assessments, and access and benefit sharing of marine genetic resources. The treaty is expected to be completed in 2020 and should allow for more integrated management of the high seas.
- 2.8. Canada adopted the United Nations (UN) Sustainable Development Goals (including Goal 14, Life Below Water), signed the 2017 UN Oceans Conference Call to Action (Commonwealth Blue Charter), and has engaged in the annual UN Our Oceans conferences, all of which elevate the profile of taking meaningful action to reduce human impacts on the ocean.
- 2.9. Canada finalized regulations in line with the UN Port State Measures Agreement to reduce Illegal, Unreported, and Unregulated fishing, ratifying the agreement in July 2019 ([Fisheries and Oceans Canada 2019c](#)).
- 3.0. **Expert Panel Key Action 1.4—The GoC should support research initiatives to strengthen scientific advice and ensure renewal of retiring scientific and managerial staff who have expertise in decision-making in the presence of complexity, trade-offs, uncertainties, and risks:** In 2016, the GoC announced a \$197 million budget allocation to DFO earmarked for research scientists, biologists, oceanographers and technicians, as well as for acquiring new technology and equipment. The resultant new hires represented the greatest single boost to DFO’s (Fisheries and Oceans Canada, formerly Department of Fisheries and Oceans) scientific staff since the extension of Canada’s exclusive economic zone of jurisdiction to 200 nautical miles in 1977.
- 3.1. In 2016, the GoC created the *Ocean Protection Plan*, a \$1.5 billion allocation of funding to enhance marine safety, preserve, and restore ecosystems, create stronger Indigenous and community partnerships, and strengthen the evidentiary basis for knowledge of how oil and petroleum products behave when spilled in marine environs ([Government of Canada 2019b](#)).

- 3.2. **Expert Panel Key Action 1.5—The GoC should fully support the provision and implementation of a management framework that maximizes opportunities for fisheries to achieve third-party certification of sustainability:** Although the GoC has acknowledged the importance of third-party certification of sustainable fisheries (Fisheries and Oceans Canada 2019k), food retailers, in partnership with NGOs and occasionally independent science advisors, have taken the lead in increasing the sustainable seafood available to consumers (Govender et al. 2016).
- 3.3. Canada assisted in developing Version 2.1 (2018) of the Fisheries Certification Process used by the Marine Stewardship Council (MSC), ensuring that Canada's Sustainable Fisheries Framework was both applicable and in line with the MSC standard. DFO has staff dedicated to MSC certifications.
- 3.4. **Expert Panel Key Action 1.6—The Auditor General of Canada could undertake a full financial, statutory, and policy audit of Canada's progress in meeting its international marine biodiversity obligations:** Under the auspices of the Office of the Auditor General of Canada, the Commissioner of the Environment and Sustainable Development (CESD) has tabled several reports dealing with aspects of marine biodiversity since February 2012. The first was the 2012 Fall Report on *Marine Protected Areas* (CESD 2012). The audit concluded that many factors impeded Canada's progress on creating MPAs.
- 3.5. The 2013 Fall Report of the CESD included a performance audit on *Meeting the Goals of the International Convention on Biological Diversity* (CESD 2013a). The audit looked at whether Environment Canada (EC) had fulfilled selected responsibilities as the National Focal Point for the CBD. The CESD followed this 2013 audit with another in 2018 on *Conserving Biodiversity* (CESD 2018b). The CESD found that Environment and Climate Change Canada (ECCC) had not (i) provided effective leadership or effectively coordinated actions required to achieve Canada's 2020 biodiversity targets or (ii) compiled comprehensive information to report on performance and progress toward the 2020 targets.
- 3.6. The overarching conclusion of the CESD's 2013 performance audit on *Recovery Planning for Species at Risk* (CESD 2013b) was that EC, DFO, and Parks Canada had not met their legal requirements for establishing recovery strategies, action plans, and management plans as required under the *Species at Risk Act*.
- 3.7. The CESD's 2016 audit on *Sustaining Canada's Major Fish Stocks* (CESD 2016) found that: (i) objectives in Integrated Fisheries Management Plans were often not stipulated, not clear, and not measurable; (ii) there were no rebuilding plans or development timelines for 80% of Canada's severely depleted fish stocks; and (iii) reference points had not been developed for more than half of Canada's major fish stocks. The CESD's audit corroborated the findings of a separate independent analysis (Oceana 2016).
- 3.8. In 2018, the CESD's Report on *Salmon Farming* (CESD 2018a) found deficiencies in how DFO and the Canadian Food Inspection Agency manage risks associated with Atlantic salmon aquaculture, a finding in accordance with the first independent review conducted under the auspices of Canada's Chief Science Advisor (Government of Canada 2018).

Recommendation 2. That the Government of Canada (GoC) resolve regulatory conflicts of interest affecting Canada's progress in fulfilling obligations to sustain marine biodiversity

PROGRESS:

- THE GOVERNMENT OF CANADA HAS MADE LITTLE PROGRESS IN RESOLVING REGULATORY CONFLICTS OF INTEREST WITHIN FISHERIES & OCEANS CANADA.
- PROGRESS IS LIMITED TO (I) A NEW STATUTORY PROVISION FOR ADVISORY BODIES AND (II) INCREASED MINISTERIAL ACCOUNTABILITY THROUGH PUBLIC MANDATE LETTERS.

Summary of the evidence

- 3.9. **Expert Panel Key Action 2.1—The GoC should develop processes and, if necessary, amend institutional structures to limit or eliminate real and perceived regulatory conflicts of interest:** The 2012 Expert Panel identified regulatory conflict as an impediment to progress in fulfilling national and international commitments to sustain marine biodiversity. Some individual federal government departments have responsibilities both to conserve and protect biodiversity and to promote the exploitation of biodiversity. Regulatory conflict can compromise the integrity of regulatory science and decision making as well as public perception of that integrity. Each stakeholder (the public, industry, NGOs, coastal communities) is placed in the position of having to ask, with respect to each regulatory decision, whether its own interests have been unduly compromised by the interests of others.
- 4.0. There is little evidence that the GoC has developed processes to limit or eliminate real or perceived regulatory conflicts. Limited progress can be found in the revised *Fisheries Act* (section 4.01(1)): “The Minister may, in order to carry out the purpose of this Act, establish advisory panels and provide for their membership, functions and operation.” An independent panel on Aquaculture Science, under the auspices of the Chief Science Advisor of Canada, found that regulatory and promotional conflicts of interest within DFO resulted in a lack of transparency in how aquaculture science is funded ([Government of Canada 2018](#)).
- 4.1. **Expert Panel Key Action 2.2—The GoC should develop processes and, if necessary, amend institutional structures to ensure that ministers are fully and transparently accountable for policy commitments to the use and conservation of marine biodiversity:** Progress has been made in strengthening ministerial accountability. This has been achieved by public release of mandate letters which outline the Prime Minister’s expectations and key priorities to be fulfilled during a Government’s mandate. Prior to 2015, mandate letters were not publicly available.

Recommendation 3. That the Government of Canada (GoC) reduce the discretionary power in fisheries management decisions exercised by the Minister of Fisheries and Oceans

PROGRESS:

- THE GOVERNMENT OF CANADA HAS MADE MODERATE PROGRESS IN REDUCING MINISTERIAL DISCRETION IN FISHERIES AND OCEANS MANAGEMENT DECISIONS.
- STEPS TO REDUCE DISCRETION ARE EVIDENCED BY A REVISED *FISHERIES ACT* THAT: (I) EXPLICITLY PROVIDES FOR STOCK REBUILDING; (II) FORMALIZES APPLICATION OF A PRECAUTIONARY-APPROACH BASED REFERENCE POINT; AND (III) PROVIDES FOR LEGISLATIVE ESTABLISHMENT OF ADVISORY BODIES.

Summary of the evidence

- 4.2. **Expert Panel Key Action 3.1—The GoC should enact prescriptive legislation containing primary objectives to: (i) prevent overfishing; (ii) rebuild depleted fish stocks; (iii) formalize the explicit use of reference points and harvest control rules; and (iv) ensure transparency and accountability in fisheries management plans, including those relating to aquaculture:** If these objectives were contained in the *Fisheries Act*, they would serve to reduce ministerial discretion to make decisions that hinder fisheries sustainability (such as the setting of directed quotas when stocks are depleted). The amended *Fisheries Act* includes, for the first time, provisions for stock rebuilding, including a requirement to rebuild above the Limit Reference Point, albeit only for major stocks prescribed by regulation. The Act still permits ministerial discretion by allowing, but not mandating, the minister to apply sustainability principles such as precaution and the ecosystem approach (section 2.5). DFO has made progress in making Integrated Fisheries Management Plans publicly available ([Fisheries and Oceans Canada 2018](#)).

- 4.3. **Expert Panel Key Action 3.2—The GoC should consider the establishment of independent, arms-length advisory or decision-making bodies on matters pertaining to the use and conservation of marine biodiversity, including catch allocations, licensing, and environmental impact assessments:** The revised *Fisheries Act* formally allows for establishment of Advisory Bodies, such as the 2017 panel on MPA standards (Fisheries and Oceans Canada 2018). In 2018, Canada’s Chief Science Advisor was asked by the Ministers of Science and Fisheries and Oceans to lead an independent panel to provide recommendations on the use of science in decision-making on aquaculture (Government of Canada 2018). A new *Impact Assessment Act*, receiving Royal Assent in June 2019, provides for environmental impact assessments of designated projects by the Impact Assessment Agency of Canada or independent review panels (Parliament of Canada 2019).
- 4.4. **Expert Panel Key Action 3.3—The Prime Minister should use a mandate letter to increase ministerial accountability within DFO; the letter could be used to provide the Minister of Fisheries and Oceans a mandate to respond to the Expert Panel’s recommendations; the mandate letter should be publicly available:** The Prime Minister’s mandate letters to three successive Ministers of Fisheries and Oceans (2015–2019) strengthened ministerial accountability regarding the use scientific evidence and the precautionary principle in fisheries and ecosystem management decisions. The mandate letter to the Minister of Environment and Climate Change (2015) directed the minister to respond quickly to science advice and complete recovery plans for species at risk in a timely manner. The public letters addressed issues that aligned with recommendations made by the Expert Panel regarding scientific evidence and the precautionary principle.

Recommendation 4. That Fisheries and Oceans Canada (DFO) rapidly increase its rate of statutory and policy implementation

PROGRESS:

- FISHERIES AND OCEANS CANADA HAS MADE LIMITED PROGRESS IN INCREASING ITS RATE OF STATUTORY OR POLICY IMPLEMENTATION.
- PROGRESS IS LIMITED TO: (I) A REVISED *OCEANS ACT* THAT ALLOWS FOR INCREASED RATE OF ESTABLISHMENT OF MARINE PROTECTED AREAS; (II) A COMMITMENT TO RENDER LISTING DECISIONS UNDER THE *SPECIES AT RISK ACT* WITHIN A SPECIFIED TIME FRAME (36 MONTHS); AND (III) STATUTORY ACKNOWLEDGEMENT OF ELEMENTS OF SUSTAINABLE FISHERIES FRAMEWORK POLICIES.

Summary of the evidence

- 4.5. **Expert Panel Key Action 4.1—DFO should fully implement the *Oceans Act* to: (i) identify biodiversity hotspots and vulnerable biological habitats; (ii) establish a comprehensive and biologically meaningful network of MPAs; and (iii) develop marine spatial planning with clear geographical priorities, explicit timelines, and transparent measures for public reporting:** The *Oceans Act* was renewed, under the auspices of Bill C-55, to create a new order power to establish MPAs rapidly (a process used, for example, in August 2019 to create the Tuvaijuittuq MPA off Ellesmere Island) (Government of Canada 1996). Almost half of the current 13.82% of protected marine areas was achieved under the auspices of the *Oceans Act*, setting the stage for MPA network planning. (Note: Marine Spatial Planning is commonly defined as a “public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives that usually have been specified through a political process” (Nowlan 2016)).
- 4.6. Following broad consultation, DFO has been drafting network plans, although these are not publicly available. Overall, limited progress has been achieved in advancing marine spatial planning (Fisheries and Oceans Canada 2019) with the possible exception of the Pacific North Coast in British Columbia’s waters (Nowlan 2016). In February 2017, the Minister of Fisheries and Oceans endorsed a plan for the Pacific North Coast Integrated Management Area

(PNCIMA) and, in June 2018, the GoC and the leaders of 14 Central and North Coast First Nations entered into the Reconciliation Framework Agreement for Bioregional Oceans Management and Protection.

- 4.7. **Expert Panel Key Action 4.2—DFO should fully implement the *Species at Risk Act* for marine fishes by including species assessed by COSEWIC as endangered and threatened on the national legal list and by affording them the full benefits of recovery strategies, including the identification of recovery targets, rebuilding timelines, and (when possible) limited directed harvests:** Little substantive progress has been achieved since 2011, the most recent year in which an endangered or threatened marine fish (as assessed by COSEWIC) was included on the national legal list (i.e., Schedule 1 of the *Species at Risk Act*). In 2017, the GoC adopted a policy ([Government of Canada 2017](#)) to limit listing decisions for aquatic species to 36 months after receipt of a species assessment from COSEWIC ([COSEWIC 2019](#)). This 3-year time frame would represent a considerable improvement over the lengthy periods (more than ten years) that have elapsed between receipt of listing advice and listing decisions for some marine species, such as the shark, shortfin mako ([COSEWIC 2018](#)).
- 4.8. Since 2012, a limited number of species-specific initiatives have been developed for at-risk marine species. Examples include the Wild Atlantic Salmon Conservation Policy ([Fisheries and Oceans Canada 2019h](#)) (the objective of which is to restore and maintain healthy wild Atlantic salmon populations) and a \$167 M investment in the science and management of three whale populations: Southern Resident Orca, North Atlantic Right Whale, and St. Lawrence Beluga ([Fisheries and Oceans Canada 2019g](#)).
- 4.9. **Expert Panel Key Action 4.3—DFO should fully implement its existing policies on marine biodiversity use and conservation, such as those included within the Sustainable Fisheries Framework:** Revisions to the *Fisheries Act* (2019) strengthened implementation of the Sustainable Fisheries Framework insofar as the Act now incorporates an obligation to rebuild depleted fish stocks. For example, section 6.1(1) states: “If a major fish stock has declined to or below its limit reference point, the Minister shall develop a plan to rebuild the stock above that point in the affected area . . .”.
- 5.0. The revised *Fisheries Act* created a new power to develop regulations to establish long-term spatial restriction areas (marine refuges) to fishing activities to protect marine biodiversity. The amended Act also makes it easier to designate Ecologically Sensitive Areas to restrict threatening development or otherwise protect sensitive areas ([Hewson 2019](#)).
- 5.1. In response to the [CESD 2016](#) audit, DFO committed ([Fisheries and Oceans Canada 2019d](#)) to address deficiencies in the setting of reference points, developing rebuilding plans, and completing Integrated Fisheries Management Plans (IFMPs). Since 2017, the percentage of stocks with limit reference points has increased from 53.6% to 64.4%. Three of 19 rebuilding plans for commercially fished species have been completed. The percentage of stocks included in IFMPs increased from 68.6% to 89.7% ([Oceana 2019](#)).

Recommendation 5. That Canada implement statutory renewal to fulfil national and international commitments to sustain marine biodiversity

PROGRESS:

- CANADA HAS MADE MODERATE PROGRESS IN IMPLEMENTING STATUTORY RENEWAL TO FULFIL COMMITMENTS TO SUSTAIN MARINE BIODIVERSITY.
- PROGRESS IS REFLECTED BY: (I) REVISIONS TO THE *FISHERIES ACT*, *OCEANS ACT*, AND *CANADA PETROLEUM RESOURCES ACT*; (II) CONSULTATIONS FOR THE DEVELOPMENT OF AN *AQUACULTURE ACT*; AND (III) A NEW POLICY FOR TRANSPARENT DECISIONS AND JUSTIFICATION TO NOT LIST AN AQUATIC SPECIES ASSESSED TO BE AT RISK.

Summary of the evidence

- 5.2. **Expert Panel Key Action 5.1—Draft and enact a modernized *Fisheries Act*, or a new statute, that: (i) identifies full implementation of the precautionary approach as an over-arching objective; (ii) provides legislative requirements and guidance on fully implementing the Sustainable Fisheries Framework; and (iii) identifies conservation of biodiversity as a core consideration in the development of fisheries management plans:** For the first time since it was passed in 1868, the *Fisheries Act* now makes explicit mention of “precaution”. Section 2.5 identifies the first of several decision-making considerations to be “application of a precautionary approach and an ecosystem approach”. The Act does, however, permit ministerial discretion by allowing, but not mandating, the minister to apply key sustainability principles such as precaution. When making a decision under the Act, the Minister is now required to consider any adverse effects it may have on the rights of Indigenous peoples.
- 5.3. The revised *Fisheries Act* includes a duty to maintain fish stocks at or above the level necessary to promote sustainability, explicitly stating the need to maintain fish stocks above their limit reference point, in accordance with the Sustainable Fisheries Framework.
- 5.4. The revised *Fisheries Act* contains new provisions related to marine conservation by providing additional ministerial powers to (i) close fisheries and address urgent situations (e.g., whale entanglement in fishing gear), (ii) designate Ecologically Significant Areas, (iii) protect areas for marine biodiversity, and (iv) prohibit shark finning in Canadian waters.
- 5.5. **Expert Panel Key Action 5.2—Draft and enact federal aquaculture legislation that specifies requirements and guidance on national objectives and procedures for all aquaculture operations and that requires a principled approach to aquaculture operations, to ensure the protection of biodiversity:** In 2019, the federal government initiated consultations on a potential federal *Aquaculture Act* ([Fisheries and Oceans Canada 2019b](#)).
- 5.6. **Expert Panel Key Action 5.3—Consider enacting comprehensive biodiversity legislation similar to that existing in Australia ([AGDEE 1999](#)) and Norway ([Government of Norway 2009](#)) to set legally binding requirements for biodiversity protection:** There is no evidence to indicate that such legislation has been considered.
- 5.7. **Expert Panel Key Action 5.4—Consider amending the *Oceans Act* to clarify integrated management procedures and responsibilities and to provide a firm legal foundation for implementing completed management plans:** The 2019 amendments to the *Oceans Act* failed to specifically address integrated ocean planning although some related progressions were made. These amendments did introduce the principle of ecological integrity for the first time in Canadian maritime law. The 2019 revisions also incorporated the precautionary principle into the Act. The government developed operational guidance for identifying and designating other effective area-based conservation measures (OECMs) and is in the process of updating this guidance to align with that agreed by the Convention of Biological Diversity. Although not MPAs, these conserved areas, such as spatial fishery closures, marine refuges, and Indigenous Protected Areas, can be considered OECMs in international marine conservation; they are included in Canada’s efforts to meet the target of protecting 10% of marine and coastal areas by 2020 ([Hewson 2019](#)).
- 5.8. Revisions to the *Canada Petroleum Resources Act* in 2019 allow the GoC to rescind oil and gas leases within MPAs established by the *Oceans Act*.
- 5.9. **Expert Panel Key Action 5.5—Strengthen the *Species at Risk Act* through key amendments that would: (i) establish a transparent evaluation and consultation process for decisions not to list a species at risk, including external review of supporting listing-decision analyses; (ii) clarify the procedure and process for developing recovery strategies and action plans; and (iii) restrict discretion to exempt activities from SARA’s prohibitions and incidental permitting requirements:** DFO has developed a *Species at Risk Act Listing Policy and Directive for “Do Not List” Advice* ([Fisheries and Oceans Canada 2016](#)). If DFO decides to advise against acceptance of COSEWIC’s advice, the policy states that a compelling reason to do so must be publicly available and that this rationale must stem from a rigorous, structured,

comprehensive and transparent analysis. The pace of development of recovery strategies and action plans has increased since the Expert Panel Report was released in 2012 (Mooers et al. 2017). It is unclear whether discretion to exempt activities from SARA's prohibitions and incidental permitting requirements has been restricted.

- 6.0. For the first time (October 2019), an Aquatic Species Working Group has been established under the auspices of the Species at Risk Advisory Committee (Government of Canada 2019c), the primary committee of stakeholders responsible for advising ECCC under the *Species at Risk Act*.

Recommendation 6. That the Government of Canada (GoC) establish national operational objectives, indicators, and targets for marine biodiversity

PROGRESS:

- THE GOVERNMENT OF CANADA HAS MADE MODERATE PROGRESS IN ESTABLISHING NATIONAL OBJECTIVES, INDICATORS AND TARGETS FOR MARINE BIODIVERSITY.
- PROGRESS IS REFLECTED BY: (i) NATIONAL REPORTING OF PROGRESS TOWARDS ACHIEVING BIODIVERSITY TARGETS; AND (ii) AUDITS TO TRACK PROGRESS IN IMPROVING MARINE FISHERIES STOCK STATUS AND MARINE POLICY COMMITMENTS.

Summary of the evidence

- 6.1. **Expert Panel Key Action 6.1—The GoC should establish operational objectives that relate to existing commitments to biodiversity conservation and formally integrate them in oceans and fisheries management; highest priority should be assigned to objectives pertaining to those impacts most likely to compromise national and international commitments to sustain marine biodiversity:** Since 2012, Canada has established a framework of required outcomes consistent with national and international biodiversity commitments.
- 6.2. The *National Report to the Convention on Biological Diversity* (Environment and Climate Change Canada 2019) identifies 19 national biodiversity targets to be achieved by 2020 and tracks progress in relation to these objectives.
- 6.3. **Expert Panel Key Action 6.2—DFO should establish biodiversity indicators and targets to assess progress towards meeting operational objectives, and annually report the status and trends of marine biodiversity (using indicators), as well as national progress in attaining policy objectives:** In 2016, DFO initiated a *Sustainability Survey for Fisheries* (Fisheries and Oceans Canada 2019i, 2019j) to track the performance of the fisheries under DFO's purview. Efforts to track progress in meeting sustainability targets are also undertaken by NGOs (Oceana 2018; CPAWS 2020).
- 6.4. Under the auspices of the Convention on Biological Diversity, Canada is co-leading the process that will establish post-2020 biodiversity targets. This is expected to lead to progressive biodiversity protection targets, following and building upon the 2010 Aichi Targets, at the COP15 in Beijing in 2020.

Future policy challenges and implementation initiatives

Policy Challenge I: Ensure climate change impacts and projections are incorporated into decision making and planning processes related to marine biodiversity

The 2012 Expert Panel Report concluded that climate change was the greatest challenge Canada faces in sustaining marine biodiversity because its effects on species and ecosystems will not be readily

reversed. This conclusion is fully supported by the recent (September 2019) Special Report on the Ocean and Cryosphere in a Changing Climate by the Intergovernmental Panel on Climate Change (IPCC) (IPCC 2019). The IPCC “highlights the urgency of prioritizing timely, ambitious, and coordinated action to address unprecedented and enduring changes in the ocean”.

Climate change is causing both gradual increases in ocean temperatures and marine heat waves, as well as ocean acidification (IPCC 2019). These changes have ramifications for overall ocean productivity, species distributions, disease outbreaks, sea level rise, and other ecosystem changes, with resulting consequences for the wild fisheries and aquaculture that our oceans can support. Failure to incorporate climate change in ocean-related policies will reduce Canada’s ability to adapt to global heating and associated ocean changes.

Implementation initiatives

- The Government of Canada (GoC) should consider amending all key statutes to require or authorise the consideration of climate change impacts and projections. For example, the *Oceans Act* might specifically authorise the establishment of MPAs as “insurance policies” to address climate change. The *Species at Risk Act* might require climate change considerations to be factored into decisions relating to the listing of species, recovery planning, and designation of critical habitat.
- The GoC should undertake marine species vulnerability assessments to identify those that have low, medium, and high vulnerability to climate change.
- The GoC should consider further developing policies relating to climate change and sustainable fisheries, aquaculture, and conservation of marine biodiversity.

Policy Challenge 2: Resolve regulatory conflicts of interest affecting progress in fulfilling obligations to sustain marine biodiversity

The 2012 Expert Panel identified regulatory conflict as an impediment to Canada’s progress in fulfilling national and international commitments to sustain marine biodiversity. Although some progress has been made, the GoC can do a great deal more to separate its responsibilities to conserve and protect biodiversity. Without effective mechanisms to ensure that all parts of Government are accountable for supporting policies on the conservation of biodiversity during decision making, progress towards fulfilling Canada’s national and international obligations to sustain biodiversity will be impeded.

Implementation initiatives

- The GoC should develop processes and, if necessary, amend institutional structures to: (i) limit or eliminate real and perceived regulatory conflicts of interest; (ii) ensure that ministers are fully and transparently accountable for policy commitments to the use and conservation of marine biodiversity; and (iii) financially account for environmental costs (OECD 2003) associated with biodiversity loss, i.e., the costs connected with actual or potential deterioration of natural assets due to economic activities.

Policy Challenge 3: Limit the discretionary power in fisheries management decisions exercised by the Minister of Fisheries and Oceans

The 2012 Expert Panel concluded that Canada’s progress in meeting its obligations to sustain marine biodiversity had been impeded by the absolute discretion afforded to the Minister of Fisheries and Oceans. The Commissioner of the Environment and Sustainable Development identified leadership

and well-defined accountability as key elements to sustainable fisheries and the management of risks associated with salmon aquaculture.

Implementation initiatives

- The GoC should develop regulations under the revised *Fisheries Act* to give effect to the Act's rebuilding and sustainable management provisions by: (i) ensuring that all major stocks are included as soon as possible, through the regulatory process (currently the law applies to none); (ii) explicitly defining an objective to rebuild stocks to long-term sustainable target levels (i.e., the Upper Stock Reference, or USR); and (iii) specifying rebuilding timelines to the greatest extent possible.
- The GoC should further limit discretionary decision-making authority by establishing the explicit expectation that fisheries are to be managed with the aim of maintaining or restoring stock levels to maximize long-term sustainable harvests, unless the minister brings forward an argument, based on criteria defined in the Act or regulations, demonstrating why this is not feasible (e.g., constitutional obligations to Indigenous peoples, biological constraints).

Policy Challenge 4: Clarify ambiguities in the Sustainable Fisheries Framework (SFF)

There is a potential for the Precautionary Approach (PA) to be misused by any stakeholder intent on pursuing their own objectives to the exclusion of others. There is a need to implement measures to minimize the probability of misuse and misinterpretation of the PA.

Implementation initiatives

- Unambiguously define the roles of science, fisheries management, and stakeholders in the SFF, especially with respect to implementation of the PA, such as the establishment of target reference points (USRs) and harvest decision rules.
- Ensure that science advice is always publicly distinguishable from other sources of advice in the setting of reference points, harvest decision rules, and other fisheries management decisions.
- Clarify undefined elements of the SFF that inhibit effective implementation of the PA. (One example would be to state unambiguously that the policy directive that "removals must be kept at the lowest possible level" when stock size is below its limit reference point means closure of all directed fisheries.)

Policy Challenge 5: Advance and implement marine spatial planning (MSP)

The 2012 Expert Panel concluded that there was a lack of clear national guidance on how best to advance MSP in Canada. It found that the *Oceans Act* does not provide an ideal legal umbrella for MSP, providing only "bare bone" integrated management planning responsibilities, with no procedural or content details, and no mention of an MSP approach.

Conflicts on all coasts of Canada are growing over large infrastructure projects, fishing and aquaculture, shipping, and marine protected areas. Climate change threatens to alter ecosystems and negatively affect coastal communities. Meaningful, respectful, and coordinated efforts to advance and implement MSP, with comprehensive zonal ecosystem-based initiatives, has potential to mitigate conflict as ocean-use pressures multiply (Nowlan 2016).

Implementation initiatives

- The GoC should consider: (i) issuing a clear national policy or strategy on MSP; (ii) amending the *Oceans Act* to explicitly require MSP, establish clear planning procedures, and provide for enforceability of finalized plans; and (iii) ensuring that MSP processes do not delay implementation of biodiversity protection measures.
- A revised *Oceans Act* could be used to: (i) identify biodiversity hotspots and vulnerable biological habitats; (ii) establish a comprehensive and biologically meaningful network of MPAs; and (iii) develop MSP with clear geographical priorities, explicit timelines, and transparent measures for public reporting.

Conclusions

In their 2019 electoral platform, the Liberals, elected to the most seats in a new minority government, committed themselves to: (i) better protection of fish stocks and marine habitat; (ii) a federal Aquaculture Act; (iii) transition from open net-pen salmon farms to closed-containment systems in British Columbia by 2025; (iv) protect 25% of Canada's oceans by 2025; and (v) ground ocean conservation efforts in science, Indigenous knowledge, and local perspectives, pledging \$255 million to establish a Canada Water Agency and other measures to protect oceans, fish, and coastal communities. Funds were also budgeted for natural climate solutions, although no specifics were provided on aquatic ecosystems. It is opportune to ask whether these new commitments are likely to be met and whether they will be sufficient in achieving the Liberal's goal to "protect the health of Canada's oceans".

The present Policy Briefing Committee report concludes that, in some areas, Canada has made moderate to good policy and statutory progress to sustain marine biodiversity since 2012. Of overarching significance was the federal government's 2015 prioritization of ocean stewardship and strengthening of the evidentiary use of science in decision making. Examples of specific accomplishments are best reflected by changes to key pieces of legislation.

The amended *Fisheries Act* strengthens implementation of DFO's sustainable fisheries policy framework insofar as there is, for the first time since the original Act was passed in 1868, a requirement to rebuild depleted fish stocks. The revised Act requires consideration of Indigenous traditional knowledge in fish-habitat protection decisions. When making a decision under the Act, the Minister is now required to consider any adverse effects it may have on the rights of Indigenous peoples. Amendments to the *Oceans Act* facilitated creation of marine protected areas that allowed Canada to exceed its international obligation to protect 10% of coastal and marine areas by 2020 (Canada now protects 13.82%).

Some progress has been made in strengthening ministerial accountability. This was achieved by public release of mandate letters which outline the Prime Minister's expectations and key priorities to be fulfilled during a government's mandate. Prior to 2015, ministerial mandate letters were not made public.

These efforts to renew legislation (including consultations on a new *Aquaculture Act*) and increase ministerial accountability align with recommendations by the 2012 Expert Panel. However, notwithstanding some progressive actions, little or no progress has been made to address emerging and long-standing weaknesses in Canada's efforts to sustain healthy oceans, such as: (i) incorporating climate change in decisions on fisheries, oceans, and marine biodiversity; (ii) resolving regulatory conflict within DFO; (iii) implementing marine spatial planning to manage ocean spaces as the demands for use and protection grow; (iv) limiting ministerial discretion; and (v) fully implementing sustainable fisheries policies.

As of early 2020, the mandate letter to the Minister of Fisheries, Oceans and the Canadian Coast Guard has been released. It reiterates the Liberal Party of Canada's 2019 election commitments, formally identifying the Government of Canada's to further increase marine ocean protection, introduce a federal Aquaculture Act, and to transition from open net-pen salmon farming in coastal British Columbia by 2025. Steps have also been initiated to formally identify the major fish stocks that will require rebuilding plans under the amended *Fisheries Act* if they decline to or below their limit reference points. Steps have also been taken to develop regulations under the revised *Fisheries Act* to give effect to the Act's rebuilding and sustainable management provisions.

There has been progress in recovering and sustaining the health of Canada's oceans. Failure to further strengthen biodiversity conservation threatens the capacity of Canada's oceans to provide ecosystem services that contribute to the resilience of marine life and the well-being of humankind. Unprecedented and enduring changes in the ocean caused by climate change have made the achievement of meaningful progress all the more urgent.

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Author contributions

JAH conceived and designed the study. JAH, JKB, SDF, JL, and DLV performed the experiments/collected the data. JAH, JKB, SDF, JL, and DLV analyzed and interpreted the data. JAH contributed resources. JAH, JKB, SDF, JL, and DLV drafted or revised the manuscript.

Competing interests

The authors have declared that no competing interests exist.

Data availability statement

All relevant data are within the paper.

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