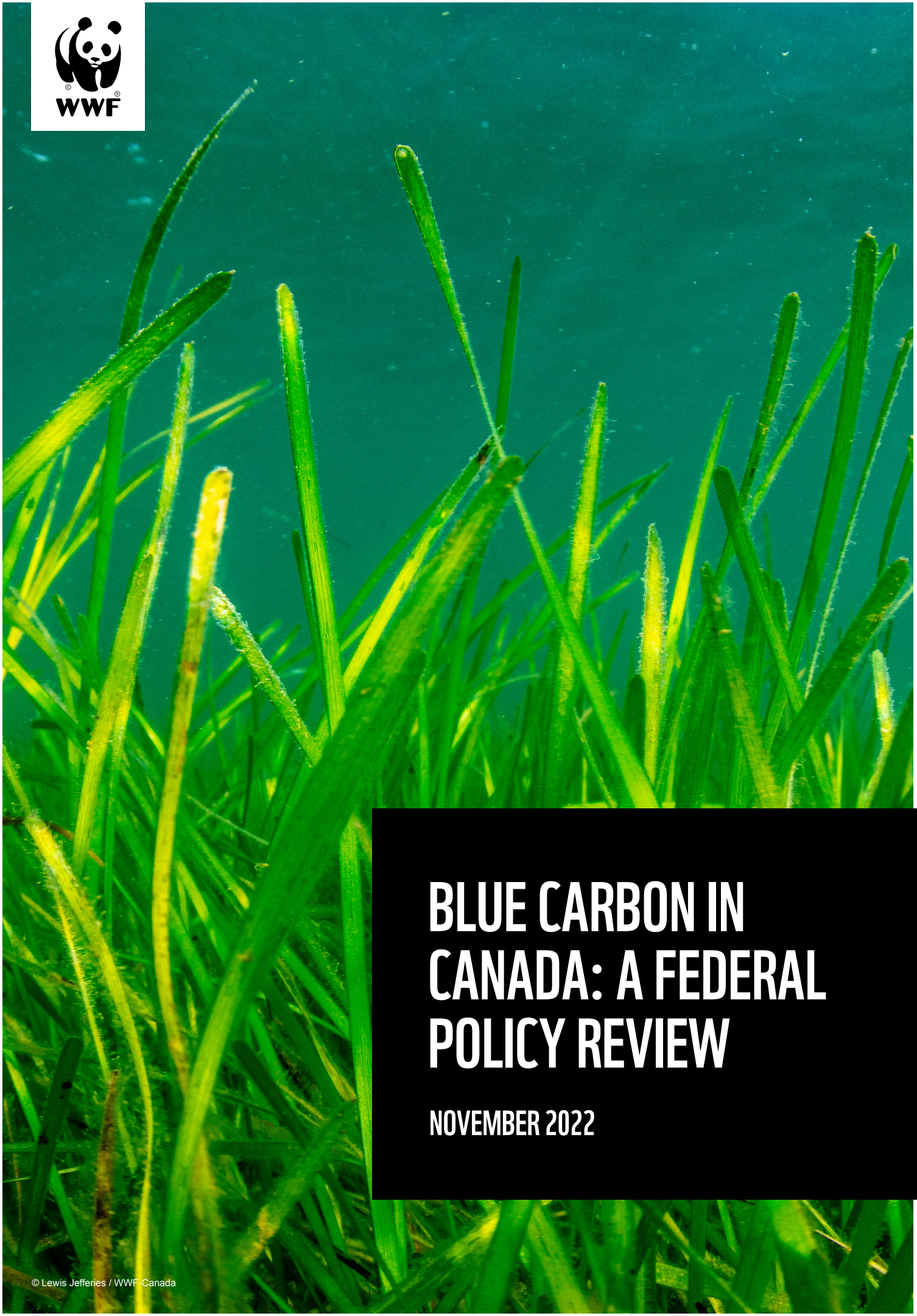


BLUE CARBON IN CANADA: A FEDERAL POLICY REVIEW

NOVEMBER 2022

WWF-Canada. 2022. Blue Carbon in Canada: A Federal Policy Review. Prepared by Dunn, K., Kanagasabesan, T., and Saunders. S. World Wildlife Fund Canada. Toronto, Canada.

This report benefited from the generous feedback of multiple members of the community of practice.

CONTENTS

BACKGROUND AND RATIONALE

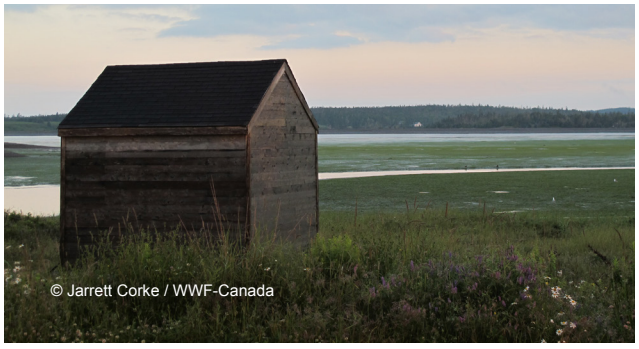
Blue carbon – the carbon stored in coastal ecosystems such as seagrass meadows, salt marshes and kelp forests – can play an important role in the fight against climate change (Mcleod et al., 2011). In addition to storing carbon, these ecosystems provide a variety of benefits that include habitat for wildlife and social, cultural and economic value for coastal communities (Macreadie et al., 2021). With the largest coastline in the world, Canada has significant stores of coastal carbon, and consequently a great responsibility to protect, restore and manage them. Despite their importance, blue carbon habitats have been significantly degraded or destroyed (Mcleod et al., 2011). Unless protected through legislation and policy, blue carbon ecosystems risk being further degraded by business-as-usual industrial projects and shoreline development.

To protect and manage blue carbon ecosystems, we must first understand the law and policy landscape in Canada as it relates to blue carbon. Initial work done by WWF-Canada and partners through the blue carbon community of practice[1] identified a gap in blue carbon policy at the federal level. Our report seeks to characterize this gap by reviewing federal environmental policy frameworks. Over the next two years, WWF-Canada will continue to work with our partners and the blue carbon community of practice to address blue carbon law and policy in Canada. Ultimately, we hope to build a pathway forward to ensure that these valuable ecosystems are appropriately protected and managed, with adequate representation in environmental law and policy at all levels.

AIMS

We conducted a content analysis of relevant federal policy frameworks, guidance documents, strategies and discussion papers to determine the extent to which blue carbon is covered in Canada's federal policy regime.[2] Our aim was three-fold:

- to understand the extent to which blue carbon is directly addressed in existing relevant federal policies;
- to determine the extent to which each policy applies to the protection and management of blue carbon habitats and ecosystems; and
- to identify ways in which blue carbon could be better integrated into each policy.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1 The blue carbon community of practice refers to those across Canada who work on the protection, management, stewardship and/or restoration of blue carbon ecosystems. WWF-Canada brought together members of the practice in 2021 over a series of national workshops, one of which specifically discussed blue carbon policy in Canada. See Summary reports for the workshops in this series.
2 For the purposes of this report, "policy" will be used as a general term encompassing all these types of documents.

CONTENT ANALYSIS:

APPROACH AND METHODS

For this report, we reviewed federal policy relevant to the management of marine and coastal ecosystems using a content-analysis approach. An initial set of documents was identified by WWF-Canada staff with expertise in coastal and marine management. Additional documents were identified by experts in the blue carbon community of practice, during both the early phases of analysis and the review period for this paper. In total, 34 documents were analyzed (see Appendix I for list).

To review the documents, we identified a set of keywords:

- accumulation
- adaptation
- blue carbon
- carbon
- climate
- coastal wetland
- eelgrass
- habitat
- intertidal
- kelp
- marsh
- mitigation
- monitoring
- mud flat
- nature-based climate solutions
- nearshore
- restoration
- restore
- salt marsh
- seagrass
- seaweed
- sequestration
- storage
- vegetation

We analyzed each document to understand its objectives, applicable jurisdiction, mechanism(s) of policy or framework implementation, and use of keywords. We then created a summary of how each document used keywords. Finally, we analyzed the content of each document to determine its applicability to blue carbon and to identify opportunities to better incorporate blue carbon, as described in our aims above.

We reviewed documents from a wide variety of sources, with most (26 of 34) coming from Fisheries and Oceans Canada and Environment and Climate Change Canada, as shown in Table 1. Outside of federal government departments, we also reviewed one document authored by the Indigenous Circle of Experts.

Table 1. Number of documents analyzed per governing authority.

Governing Authority	Number of documents reviewed (n=34)
Fisheries and Oceans Canada	15
Environment and Climate Change Canada	11
Government of Canada (general and/or jointly with provinces and territories)	4
Impact Assessment Agency of Canada	1
Indigenous Circle of Experts	1
Infrastructure Canada	1
Transport Canada	1

LIMITATIONS

Though they are outside the scope of this analysis, we recognize that law and policy from other governing bodies in Canada are equally important for blue carbon and will play a key role in filling the policy gap; ongoing research in these areas is highlighted in the box to the right. Additionally, this review is limited to federal policy in Canada, though we recognize that much may be learned by examining equivalent environmental policy in other countries. Finally, our scope is limited to vegetated coastal blue carbon ecosystems found in Canada and thus excludes other blue carbon ecosystem types and components, such as mangroves and marine sediments.

Examining law and policy from other jurisdictions

To complement this analysis of federal blue carbon policy, WWF-Canada is working with its partners to examine laws and policies relevant to the management and protection of blue carbon from other governing bodies in Canada. These include provincial, territorial, Indigenous and municipal governments. Policy from these governing bodies can play an important role in the management and protection of blue carbon moving forward, in addition to new and improved policy at the federal level. Combined, this series of analyses will form a complete picture of the blue carbon policy landscape in Canada today.

RESULTS AND DISCUSSION

A detailed summary of the content analysis can be found in Appendix II, which provides the following information for each document reviewed: publication details, jurisdiction, implementing authority, use of keywords, applicability to blue carbon ecosystems, and opportunities to better incorporate blue carbon. In this section, we highlight themes emerging from this analysis that we hope will enrich future consideration of federal blue carbon policy in Canada.

1. Applicability of federal policies to blue carbon

We found that all of the documents analyzed were applicable to blue carbon in some way. However, there was a spectrum of relevance, from explicit inclusion of blue carbon to a tangential connection. None of the documents we analyzed comprehensively considered the management and protection of blue carbon ecosystems, confirming the federal policy gap with respect to blue carbon (see also Section 4: Themes and Priorities). Summary notes on each document's applicability to blue carbon can be found in Appendix II.

Of the 34 documents reviewed, only four (Blue Economy Strategy Engagement Paper, Blue Economy Strategy What We Heard, Climate Science 2050: Advancing Science and Knowledge on Climate Change, and Canada's 2030 Emissions Reduction Plan) explicitly used the term "blue carbon." This is not surprising as the term has only gained currency over the past few years. The four documents that use it were among the most recent in our review, all released in 2021 or 2022 (though it bears noting that several other documents in this review were published in these same years, and do not use the term "blue carbon"). The policies that explicitly use the term "blue carbon" come from Fisheries and Oceans Canada and Environment and Climate Change Canada.

Several of the other documents reviewed pertain directly to blue carbon ecosystems without explicitly using the term. These include The Federal Policy on Wetland Conservation, the Fish and Fish Habitat Protection Policy Statement, Guidelines to Avoid Harm to Migratory Birds, A New Ecosystem Science Framework in Support of Integrated Management and the Pan-Canadian Framework on Clean Growth and Climate Change. All of these documents specifically discuss wetlands; the National Framework for Canada's Network of Marine Protected Areas refers to coastal salt marshes, seagrasses and kelp forests. Other documents, such as the Aquaculture Act Discussion Paper and the Framework for the Identification, Establishment and Management of Ecologically Significant Areas, note habitat more broadly but could apply specifically to blue carbon habitats.

Additionally, several documents note the importance of carbon-rich habitats to mitigating climate change. These documents include the National Framework for Canada's Network of Marine Protected Areas, Canada's Pathway to Target 1 Report, The Federal Policy on Wetland Conservation, Building the Canada We Want in 2050: Engagement on the National Infrastructure Assessment, Blue Economy Strategy Engagement Paper, Strategic Assessment of Climate Change and the Pan-Canadian Framework on Clean Growth and Climate Change. While some of these documents use only terrestrial examples, they do recognize the need to protect and restore carbon-rich ecosystems to mitigate climate change impacts.

2. Observations regarding timespan and currency of policies

The policies analyzed for this report span a considerable period, having been released over three decades from 1991 to 2022. It was difficult to judge the extent to which the older documents are still guiding decision-making in Canada today. Significantly, we observed that government policies released within a similar timeframe referred to each other, but that subsequent policies did not usually make explicit reference to older ones, even when discussing a closely related subject. The age of some of these documents, combined with a lack of references to them, raises the question of how relevant they are to a consideration of how to improve Canada's policy landscape. For the purposes of this analysis, we assumed that all policies still available on the Government of Canada website were in fact current and in active use.

In contrast to these older documents, some of the policies included in this analysis are for acts, policies or frameworks that are still in the discussion phase (e.g., Blue Economy Strategy, Aquaculture Act, Ecologically Significant Areas Framework, National Adaptation Strategy). We assume that there will be sufficient opportunity to include blue carbon as these policies are fully developed.

3. Considerations of jurisdiction and the marine/terrestrial divide

Federal government departments divide responsibility for managing various habitat types, and in particular create a division between marine and terrestrial environments. For the most part, their policies follow this division, as shown in Appendix I, though some federal policies are more inclusive (e.g., Strategic Assessment of Climate Change). In this analysis, the divide is most notable between Fisheries and Oceans Canada and Environment and Climate Change Canada, who between them are responsible for most of the policies applicable to blue carbon, as previously discussed (see Table 1).

However, blue carbon ecosystems cross these artificial boundaries. The administrative divide influences who manages these ecosystems, and what tools are used to manage them. Collaboration across jurisdictions is often necessary to effectively manage blue carbon ecosystems. For example, in 2006, the Musquash Estuary Marine Protected Area (MPA) was created to protect the largest ecologically intact salt marsh estuary in the Bay of Fundy using the Oceans Act. While the boundary of the Musquash Estuary MPA is defined by the water level at low tide, most of the intertidal area is also managed by Fisheries and Oceans Canada as the Administered Intertidal Area through an agreement between the Government of Canada and the Province of New Brunswick. Additional lands surrounding the MPA are privately protected or managed by other organizations such as Ducks Unlimited and the Nature Conservancy of Canada.

In the previous section, we noted the challenge posed by the age range of policies applicable to blue carbon. Compounding this challenge is the administrative divide between federal government departments, and in particular the artificial boundary between the management of terrestrial and marine blue carbon habitats. This divide complicates the discussion of how to better represent blue carbon in Canada's policy landscape. We believe that interdepartmental coordination will be needed when blue carbon policy in Canada is being developed or integrated.

4. Themes and priorities common to federal policies

In the policy documents analyzed, we noted the following common themes and priorities:

- Indigenous perspectives on conservation efforts
- further understanding of critical ecosystems
- mitigation of climate change impacts
- protection of critical habitats/ecosystems

Most of the documents analyzed mentioned some of these themes and priorities. However, only one – Climate Science 2050: Advancing Science and Knowledge on Climate Change – addressed all of them. For example, many documents noted the need to protect important ecosystems, but without linking this to climate change mitigation.

The themes and priorities listed above are essential for blue carbon conservation. Key ideas and concepts derived from these themes and priorities could be applied to future blue carbon policies, and were considered while drafting the Moving Forward section below. Observations in this section also significantly contribute to our confirmation of a policy gap for blue carbon in Canada's federal policy regime.

5. Opportunities to better incorporate blue carbon

In most policies reviewed in this analysis, blue carbon ecosystems were referred to indirectly through the use of general terms (see 1. Applicability). Policies could be updated to explicitly identify the types of blue carbon ecosystems and/or their carbon-sequestration potential. In most cases, policies must explicitly define and use specific terms for the habitat or ecosystem if these are to be considered fully in the decision-making process.

In the Moving Forward section below, discussion questions explore opportunities to better incorporate blue carbon in relevant and/or new policies. Suggestions for each document are also summarized in Appendix II.

MOVING FORWARD

At this early stage of considering the blue carbon policy gap in Canada, we offer the following set of discussion questions to move the conversation forward, based on the analysis presented here.

1. Given the results of this policy review, does Canada need a federal policy framework specifically for blue carbon?
    a. If so, what would be the framework's goals, what should it contain and which department would be best placed to lead it? How could we ensure that this framework covers a variety of situations, such as impact assessment, fisheries management and climate change mitigation?
    b. As blue carbon crosses marine and terrestrial realms, management is complex from a federal perspective. How can a federal policy framework for blue carbon work well across non-federal jurisdictions, including provincial, territorial, municipal and Indigenous governments, all of which have an important role to play? Furthermore, how can a federal blue carbon framework adequately account for the connectivity and ecosystem functioning between the marine and terrestrial realms, given that many current policies artificially separate the marine and terrestrial environment?
2. Regardless of whether there is a federal framework for blue carbon, how does Canada ensure that blue carbon is adequately considered across relevant policy frameworks and associated decision-making?
    a. How can departments incorporate blue carbon into other policies, strategies and frameworks, such as those noted in this report? Are there particularly relevant policies that should be prioritized for updating?
    b. How does Canada build interdepartmental capacity? How does Canada promote understanding of blue carbon ecosystems and their benefits, such as carbon sequestration and climate change mitigation?
    c. We are anticipating growth in research into understanding of blue carbon ecosystems. How will Canada incorporate new knowledge into decision-making processes?
4. The policies reviewed propose measures to mitigate risks to blue carbon ecosystems. Elsewhere, efforts are being made to quantify the carbon sequestration capacities of these ecosystems. How do we ensure that the data on carbon sequestration is used to inform and prioritize the mitigation measures in policy?
5. With respect to all discussion questions above, how can Canada and blue carbon practitioners respect the rights and title of Indigenous Peoples and the treaties between these Peoples and the Crown? How can Canada meaningfully incorporate Indigenous perspectives, knowledge and governance systems into blue carbon policy and management?

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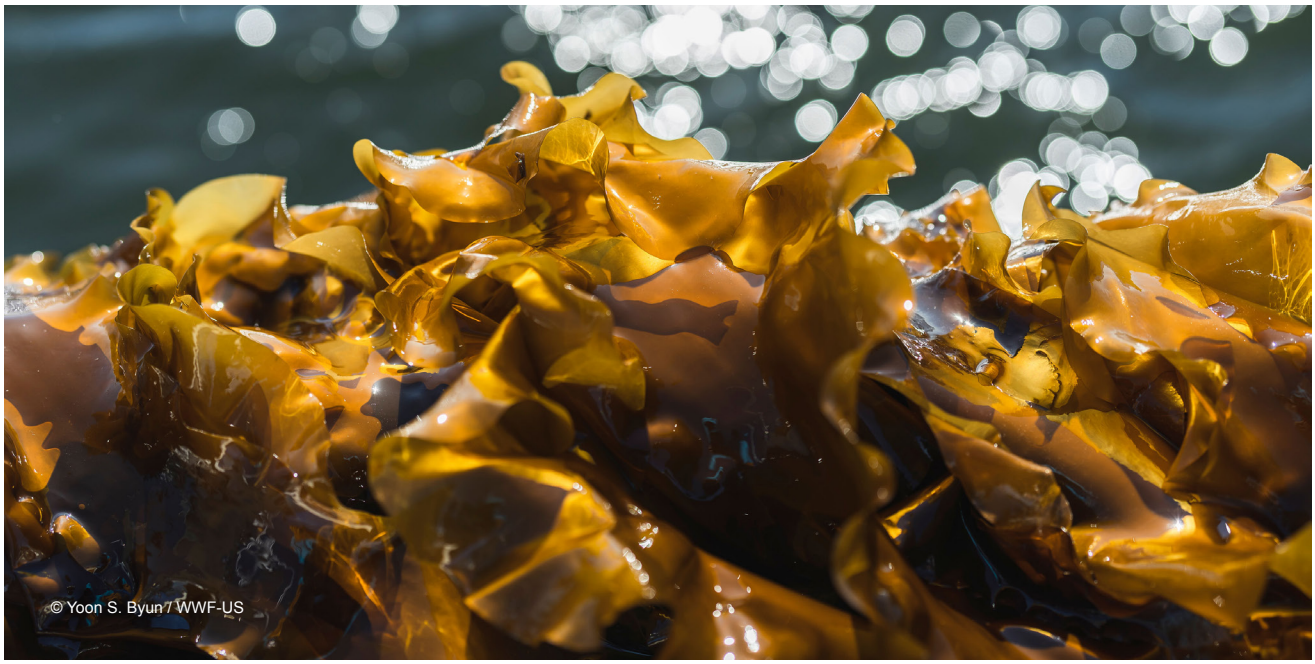
APPENDIX I:

DOCUMENTS REVIEWED

Document	Year Released
Fisheries and Oceans Canada	
Canada's Oceans Strategy	2002
Identification of Ecologically and Biologically Significant Areas	2004
Canada's Oceans Action Plan	2005
A New Ecosystem Science Framework in Support of Integrated Management	2007
A Fishery Decision-Making Framework Incorporating the Precautionary Approach	2009
Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas	2009
Ecologically and Biologically Significant Areas: Lessons Learned	2011
National Framework for Canada's Network of Marine Protected Areas	2011
Small Craft Harbours Harbour Authority Manual/Environment	2012
Fish and Fish Habitat Protection Policy Statement	2019
Policy for Applying Measures to Offset Adverse Effects on Fish and Fish Habitat Under the Fisheries Act	2019
Discussion Paper: A Canadian Aquaculture Act	2020
Blue Economy Strategy Engagement Paper	2021
Engaging on Canada's Blue Economy Strategy What We Heard	2022
Ecologically Significant Areas Framework	2022
Environment and Climate Change Canada	
The Federal Policy on Wetland Conservation	1991
The Federal Policy on Wetland Conservation Implementation Guide For Federal Land Managers	1996
Pan-Canadian Approach to Transforming Species at Risk Conservation in Canada	2018
Carbon Pollution Pricing: Options for a Federal GHG Offset System	2019
A Healthy Environment and a Healthy Economy Canada's strengthened climate plan to create jobs and support people, communities and the planet	2020
Climate Science 2050: Advancing Science and Knowledge on Climate Change	2020

Adapting to the impacts of Climate Change in Canada: An Update on the National Adaptation Strategy	2021
Guidelines to Avoid Harm to Migratory Birds	2021
Strategic Assessment of Climate Change	2021
Achieving a Sustainable Future Draft Federal Sustainable Development Strategy 2022 to 2026	2021
Canada's 2030 Emissions Reduction Plan	2022
Infrastructure Canada	
Building the Canada we want in 2050: Engagement on the National Infrastructure Assessment	2021
Transport Canada	
Ports Modernization Review: Discussion Paper	2018
Impact Assessment Agency of Canada	
Practitioner's Guide to Federal Impact Assessments	2021
Government of Canada	
Arctic and Northern Policy Framework	2016
Pan-Canadian Framework on Clean Growth and Climate Change	2016
Canada's Pathway to Target 1 Report: One with Nature - a renewed approach to freshwater and land conservation in Canada	2018
Government of Canada Green Bond Framework	2022
Indigenous Circle of Experts	
We Rise Together: Achieving Pathway to Canada Target 1 through the creation of Indigenous Protected and Conserved Areas in the spirit and practice of reconciliation	2018



APPENDIX II:

CONTENT ANALYSIS

Fisheries and Oceans Canada

Canada's Oceans Strategy

Date Released: 2002

Responsible Authority: Fisheries and Oceans Canada

Policy or Framework Objective: Integrated management of estuarine, coastal and marine environments in Canada.

Jurisdiction: National estuarine, coastal and marine environments

Mechanism of Policy or Framework Implementation: Oceans Act. The act commits Canada to promoting the understanding of oceans, ocean processes, marine ecosystems and marine resources. It also commits Canada to fostering the sustainable development of oceans and their resources, and asserts that ecosystem-based conservation is fundamentally important to maintaining biological diversity and productivity in the marine environment. The act calls on the Minister of Fisheries and Oceans to "lead and facilitate the development and implementation of plans for the Integrated Management of all activities or measures in or affecting estuaries, coastal waters, and marine waters that form part of Canada, or in which Canada has sovereign rights under international law."

Use of Keywords: While the strategy doesn't refer specifically to blue carbon or nature-based climate solutions, it does provide an overview of the process for managing development in estuarine, coastal and marine areas. It notes that coastal areas are the principal location where the effects of land use and of climate change will be most readily apparent, and where planning and adaptive management are needed to address the local marine issues. It also notes that integrated management is intended to support diversified, balanced economic development of oceans and coastal waters by protecting their health, preserving their biodiversity and maintaining their productivity. Specifically, it points out the need to balance protection of marine ecosystems with economic-development potential. This balance can be achieved through appropriate levels of risk management. Strategies include using the precautionary approach, setting predetermined thresholds for action, promoting investments in learning, and securing commitments for protecting vital areas.

Existing Applicability to Blue Carbon Ecosystems: The strategy outlines the process for performing integrated management planning processes, including within coastal management areas, and the process for protecting ecologically sensitive habitats in marine protected areas.

Opportunities to Better Incorporate Blue Carbon: The strategy could be updated to more explicitly identify the types of blue carbon ecosystems instead of just using the more general "estuarine, coastal and marine environments." Integrated management and protection could focus on protecting these ecosystems as nature-based solutions to the climate crisis. That said, the strategy itself is 20 years old and needs updating for more than just this – for example, Large Ocean Management Areas are no longer used for integrated oceans management.

Identification of Ecologically and Biologically Significant Areas and Ecologically and Biologically Significant Areas — Lessons Learned

Date Released: 2004, 2011

Responsible Authority: Fisheries and Oceans Canada

Policy or Framework Objective: The framework provides a scientific tool and set of criteria to identify and describe areas of particularly high ecological or biological significance. These areas require greater attention and risk management.

Jurisdiction: National

Mechanism of Policy or Framework Implementation: This framework is not regulatory in nature. It is grounded in the Oceans Act, which authorizes Fisheries and Oceans Canada (DFO) to provide enhanced protection to areas of the oceans and coasts that are ecologically or biologically significant, and to develop and implement integrated management plans for Canada's ocean territory.

Use of Keywords: This framework does not refer to blue carbon or discuss specific ecosystem/habitat types. The criteria for identifying Ecologically and Biologically Significant Areas (EBSA) were originally created for use in offshore areas, not nearshore/coastal areas. However, there is some advice about how EBSA criteria apply to coastal and estuarine areas. Climate and carbon are not considered.

Existing Applicability to Blue Carbon Ecosystems: Blue carbon ecosystems could certainly meet EBSA criteria and be identified as such. The EBSA criteria are "generally applicable" to coastal and estuarine habitats, even though ecological functions and processes differ between coastal and offshore areas. The criteria include blue carbon ecological functions (e.g., spawning, breeding, nursery and feeding) and structural features (e.g., tidal mixing).

Opportunities to Better Incorporate Blue Carbon: The framework notes that there is little guidance for the use of EBSAs outside of MPA network development, but potential for greater use by other processes and other federal departments, presumably including those related to blue carbon. There is no predefined spatial scale for the identification of EBSAs; the framework recommends scales appropriate for policy and management, and these scales could be defined to be relevant to blue carbon management. Risk from human activities or other threats is not considered when identifying an EBSA, but can be used to prioritize what areas are assessed/reassessed; protection of blue carbon ecosystems and in particular those under threat could warrant prioritization for assessment/reassessment at an appropriate scale. Blue carbon sequestration/storage could be integrated into EBSA criteria, for example as an element of ecosystem function.

Canada's Oceans Action Plan

Date Released: 2005

Responsible Authority: Fisheries and Oceans Canada

Policy or Framework Objective: The Oceans Action Plan aims to articulate a government-wide approach to sustainably develop and manage Canada's oceans.

Jurisdiction: National estuarine, coastal and marine environments

Mechanism of Policy or Framework Implementation: Oceans Act. The act commits Canada to promoting the understanding of oceans, ocean processes, marine ecosystems and marine resources. It also commits Canada to fostering the sustainable development of oceans and their resources, and asserts that ecosystem-based conservation is fundamentally important to maintaining biological diversity and productivity in the marine environment. The act calls on the Minister of Fisheries and Oceans to "lead and facilitate the development and implementation of plans for the Integrated Management of all activities or measures in or affecting estuaries, coastal waters, and marine waters that form part of Canada, or in which Canada has sovereign rights under international law."

Use of Keywords: The plan does not mention blue carbon or other specific ecosystem types. It does note the need to use ecosystem-based management and apply conservation and protection measures in the marine environment through marine protected areas and regulations, guidelines, and standards to ensure marine environmental quality.

Existing Applicability to Blue Carbon Ecosystems: The plan does note the need to identify ecologically significant areas and protect the most important, productive and biologically diverse areas; though not specified, these areas could include blue carbon ecosystems. The plan also notes the need to monitor indicators of ocean health, including the presence and extent of habitat alteration and degradation, which is applicable to blue carbon ecosystems.

Opportunities to Better Incorporate Blue Carbon: The strategy could be updated to more explicitly identify the types of ecosystems in need of management, restoration and/or protection. It could also propose that integrated management and protection focus on protecting these ecosystems as nature-based solutions to the climate crisis. That said, this plan is quite outdated and barely touches on climate change, let alone nature-based climate solutions or carbon-rich ecosystems. It would need updating on more than just blue carbon.

A New Ecosystem Science Framework in Support of Integrated Management

Date Released: 2007

Responsible Authority: Fisheries and Oceans Canada

Policy or Framework Objective: Proposed framework for DFO Science to realign its provision of science support with an ecosystem approach to integrated management.

Jurisdiction: National

Mechanism of Policy or Framework Implementation: This framework is not regulatory in nature. It is grounded in the Oceans Act, which authorizes DFO to undertake integrated management of Canada's ocean territory.

Use of Keywords: While blue carbon is not mentioned explicitly, this high-level framework is intended to apply broadly to all ecosystem and habitat types. Some blue carbon ecosystem types (e.g., coastal areas, wetlands) are mentioned as examples in the framework's annex.

Existing Applicability to Blue Carbon Ecosystems: The framework is intended to support integrated/linked policy making and management activities as well as the modernization of DFO program delivery. This could include new policies/ programs for blue carbon or the integration of blue carbon into other integrated management activities. As a high-level framework, this document does not specifically include blue carbon.

Opportunities to Better Incorporate Blue Carbon: Each of the eight components of the framework could be made relevant to blue carbon as they are implemented. For example, Component 7 refers to key features of ecosystem function, and could include carbon sequestration and storage. Component 8 refers to accessing existing knowledge and management methodologies, and could include emerging blue carbon databases.

A Fishery Decision-Making Framework Incorporating the Precautionary Approach

Date Released: 2009

Responsible Authority: Fisheries and Oceans Canada

Policy or Framework Objective: The framework applies where decisions on harvest strategies or harvest rates for a stock must be made on an annual basis or other time frame to determine measures to control harvests.

Jurisdiction: National

Mechanism of Policy or Framework Implementation: Fisheries Act. The precautionary approach in fisheries management recommends being cautious when scientific knowledge is uncertain, and not using the absence of adequate scientific information as a reason to postpone or fail to take action to avoid serious harm to fish stocks or their ecosystem. This framework applies to decisions on harvest strategies for key harvested stocks and is part of an overall Sustainable Fisheries Framework for Canadian fisheries.

Use of Keywords: The policy does not mention blue carbon or related habitats specifically. This framework is specific to the management of fish stocks through a precautionary approach. The following are the primary components of the generalized framework: reference points and stock status zones, harvest strategy and harvest decision rules, and the need to take into account uncertainty and risk when developing reference points and developing and implementing decision rules.

Existing Applicability to Blue Carbon Ecosystems: This framework is only applicable to fish stocks; however, blue carbon ecosystems that provide habitat to these fisheries can impact fish stocks and also be impacted by fluctuations in fish stocks.

Opportunities to Better Incorporate Blue Carbon: An important aspect of this decision framework is the treatment of uncertainty and risk when estimating stock status, establishing reference points, and making and implementing management decisions. This approach could be used to assess how the health of blue carbon ecosystems impacts fish stocks, and vice versa.

Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas

Date Released: 2009

Responsible Authority: Fisheries and Oceans Canada

Policy or Framework Objective: The policy aims to manage fisheries to mitigate impacts of fishing on sensitive benthic areas or avoid impacts of fishing that are likely to cause serious or irreversible harm to sensitive marine habitat, communities and species.

Jurisdiction: National, with some application to international waters; applied to all commercial, recreational and Indigenous activities managed or licensed under the Fisheries Act. Also includes all fishing activities managed by Canada outside of Canada's Exclusive Economic Zone.

Mechanism of Policy or Framework Implementation: Policy is guided by the legal and policy framework for fisheries and oceans management in Canada, including the Fisheries Act, Oceans Act, Species at Risk Act, the Oceans Action Plan, and the New Emerging Fisheries Policy. Internationally, the policy is grounded in Canada's commitments to the United Nations Convention on the Law of the Sea, the Convention on Biological Diversity, and the United Nations Fisheries Agreement.

Use of Keywords: While this policy contains no direct reference to blue carbon or blue carbon habitat types, its singular focus on benthic habitats provides an inherent link to intertidal, coastal and nearshore blue carbon ecosystems.

Existing Applicability to Blue Carbon Ecosystems: This policy outlines the data collection, identification and risk analysis associated with the impacts (existing or future) of fishing activity on sensitive benthic habitats, some of which would include blue carbon ecosystem features and functions.

Opportunities to Better Incorporate Blue Carbon: Blue carbon could be incorporated into each of the three main process components of this policy. For data collection, sources of information regarding blue carbon could be incorporated (e.g., location, function). For identification, blue carbon could be considered as part of the ecological significance of a benthic area, more specifically as a significant or essential ecological function. Risk analysis could include assessment of sensitivity of blue carbon stores to proposed or ongoing fishing activity, and the associated carbon/climate impacts anticipated from disturbance. According to the policy, management measures for sensitive benthic areas apply a precautionary approach; blue carbon ecosystems may especially warrant such an approach, given their function and the lack of regulatory/policy guidance. For example, considerations for new bottom-contact fisheries and proposals to expand existing bottom-contact fisheries should both apply an additional level of precaution in blue carbon ecosystems.

National Framework for Canada's Network of Marine Protected Areas

Date Released: 2011

Responsible Authority: Fisheries and Oceans Canada

Policy or Framework Objective: Provides strategic direction for the design of a national network of marine protected areas (MPAs) in order to protect marine biodiversity.

Jurisdiction: National estuarine, coastal and marine environments

Mechanism of Policy or Framework Implementation: Oceans Act. The act assigns responsibility to the Minister of Fisheries and Oceans to lead and coordinate development and implementation of a national system (or network) of MPAs on behalf of the Government of Canada, within the context of integrated management of estuarine, coastal and marine environments.

Use of Keywords: While the strategy doesn't specifically use the terms blue carbon or nature-based climate solutions, it does outline the process to create a network of MPAs in the Canadian portion of the Arctic, Atlantic and Pacific Oceans from the high-water mark outwards to the edge of the Exclusive Economic Zone. It states that networks of MPAs can contribute to climate change mitigation and adaptation by protecting habitats that capture and store carbon (e.g., coastal salt marshes, seagrasses and kelp forests) and protect coastal ecosystems, such as wetlands, that buffer against impacts from extreme weather events.

Existing Applicability to Blue Carbon Ecosystems: The framework does allow for the protection of blue carbon ecosystems in federal waters, though it would need to enter into arrangements with provincial governments to protect ecosystems above the high-water mark.

Opportunities to Better Incorporate Blue Carbon: The framework could specifically mention the carbon stored in blue carbon habitats as a reason to protect sites.

Small Craft Harbours Harbour Authority Manual/Environment

Date Released: 2012

Responsible Authority: Fisheries and Oceans Canada

Policy or Framework Objective: This manual outlines Harbour Authority responsibilities in environmental management. It sets out harbour environmental rules, best management practices, and environmental targets to ensure that harbour operations do not adversely affect the environment and that potential impacts are identified/mitigated.

Jurisdiction: National

Mechanism of Policy or Framework Implementation: The following acts are referenced in this manual regarding requirements for pollution prevention, ensuring harbour operations do not affect the environment adversely, and identification and mitigation of potential environmental effects of small craft harbour development projects on the environment: Fisheries Act, Canada Shipping Act, Marine Liability Act, Canadian Environmental Assessment Act, Navigable Waters Protection Act, Species at Risk Act, Transportation of Dangerous Goods Act and Hazardous Products Act.

Use of Keywords: Blue carbon or specific habitat types are not mentioned in this document. However, the manual does state ways in which fish and the environment should be protected from harbour operations (including impacts from pollution, toxic substances and physical alteration). Protection and mitigation measures can be applied to reduce impacts to water quality, species at risk and their critical habitats.

Existing Applicability to Blue Carbon Ecosystems: The applicability to blue carbon ecosystems is strong as harbour operations can have direct impacts on blue carbon ecosystems. Best management practices and environmental requirements for construction and dredging projects can be applied to blue carbon ecosystems.

Opportunities to Better Incorporate Blue Carbon: There is an opportunity to incorporate protection and mitigation of impacts toward blue carbon resources through harbour operation impacts on aquatic ecosystems/fish habitat. The document uses the general term "environment," which could be further defined.

Fish and Fish Habitat Protection Policy Statement

Date Released: 2019

Responsible Authority: Fisheries and Oceans Canada

Policy or Framework Objective: Provides information on provisions in the Fisheries Act to protect fish and fish habitat, and outlines how these provisions will be implemented.

Jurisdiction: National freshwater, estuarine, and marine environments ("All waters frequented by fish").

Mechanism of Policy or Framework Implementation: Fisheries Act. The act contains provisions to regulate works, undertakings or activities that could result in harmful impacts to fish and fish habitat. Examples of such impacts are the death of fish by means other than by fishing and the harmful alteration, disruption or destruction of fish habitat. Section 35 in particular prohibits harming fish habitat.

Use of Keywords: The policy's stated objectives are to avoid harmful impacts to fish and fish habitat whenever possible, though the Ministry may authorize projects that cause harm to fish habitat. Though the policy doesn't specifically mention blue carbon, it does state that fish habitat is threatened by habitat degradation and modification, with the infilling of wetlands given as an example. When harm to fish habitat cannot be avoided, impacts should be mitigated to the extent possible. Offsetting can be used if impacts cannot be avoided or sufficiently mitigated. Offsetting measures can include restoration of damaged ecosystems, and may seek to replace the same type of habitat that has been affected by the work, undertaking or activity.

Existing Applicability to Blue Carbon Ecosystems: As blue carbon ecosystems tend to be important fish habitat, the policy does apply. The act's provisions can be used to avoid or mitigate impacts on these ecosystems, or to restore damaged blue carbon ecosystems through offsetting programs.

Opportunities to Better Incorporate Blue Carbon: The framework could more specifically include blue carbon ecosystems. As the policy is informed by the best available science, climate considerations like the carbon sequestration potential, wave attenuation or storm-surge protection functions of an ecosystem could also be factors when considering giving an authorization for the destruction of fish habitat in blue carbon ecosystems. DFO is also currently developing its Framework for the Identification, Establishment and Management of Ecologically Significant Areas. These areas are to be managed using a regulatory, area-based management that protects sensitive, highly productive, rare or unique ecosystems. The Framework for the Identification, Establishment and Management of Ecologically Significant Areas aims to protect fish habitat, which could include blue carbon ecosystems, from activities other than fishing.

Policy for Applying Measures to Offset Adverse Effects on Fish and Fish Habitat Under the Fisheries Act

Date Released: 2019

Responsible Authority: Fisheries and Oceans Canada

Policy or Framework Objective: Policy provides guidance on undertaking effective measures to offset the harmful alteration, disruption or destruction of fish habitat, and developing an offsetting plan, consistent with the fish and fish habitat protection provisions of Canada's Fisheries Act.

Jurisdiction: National estuarine, coastal and marine environments

Mechanism of Policy or Framework Implementation: Fisheries Act. The act contains provisions to conserve and protect fish and fish habitat by regulating works, undertakings or activities that could result in harmful impacts to fish and fish habitat. Examples of such impacts are the death of fish by means other than by fishing or the harmful alteration, disruption or destruction of fish habitat. In particular, sections 34 and 35 prohibit harming fish habitat and fish, protect free fish passage and sufficient water flows, and address managing/controlling obstructions.

Use of Keywords: The policy's stated objectives are to avoid harmful impacts to fish and fish habitat whenever possible, though the Ministry may authorize projects that cause harm to fish habitat. Though the policy doesn't specifically mention blue carbon, it does state that fish habitat is threatened by habitat degradation and modification. When harm to fish habitat cannot be avoided, impacts should be mitigated to the extent possible. Mitigation measures can include employing best practices to avoid harm, taking measures to stabilize disturbed sites, and timing certain works to minimize interactions with fish/fish habitat. Offsetting can be used as a last resort if impacts cannot be avoided or sufficiently mitigated. Offsetting measures can include restoring damaged ecosystems, enhancing fish habitat or creating new sustainable fish habitat. However, the hierarchy of measures is avoid, mitigate, offset (based on an internationally recognized best practice for reducing risks to biodiversity). It is more difficult, costly and uncertain to restore, enhance or create aquatic ecosystems than it is to avoid adverse effects in the first place.

Existing Applicability to Blue Carbon Ecosystems: As blue carbon ecosystems tend to be important fish habitat, the policy does apply. The act's provisions can be used to avoid or mitigate impacts on these ecosystems, or to restore damaged blue carbon ecosystems through offsetting programs. The policy also provides examples of habitat restoration and enhancement measures for offsets. These may include, but are not limited to, establishing or enhancing vegetated areas in lakes, estuaries and coastal areas.

Opportunities to Better Incorporate Blue Carbon: The policy states that measures to offset should be designed to contribute to objectives identified in fisheries management plans and can also support regional restoration priorities. Priorities could be modified to specifically include blue carbon habitats that provide valuable fish habitat. As the policy provides examples of habitat restoration and enhancement measures for offsetting (e.g., establishing or enhancing vegetated areas in lakes, estuaries and coastal areas), the policy could consider including a provision that addresses blue carbon resources within these vegetated areas through a quantitative approach. Uncertainty may arise from the natural variability of fish populations and ecosystem dynamics, a changing climate and invasive species. This uncertainty entails monitoring that could include blue carbon priorities.

Discussion Paper: A Canadian Aquaculture Act

Date Released: 2020

Responsible Authority: Fisheries and Oceans Canada

Policy or Framework Objective: The discussion paper aims to outline key elements and authorities that are being proposed as part of a federal aquaculture act. Key elements include fostering national consistency while respecting federal, provincial and territorial jurisdiction, improving clarity and certainty for the industry, enhancing environmental protection, and helping sustainably grow the aquaculture industry for the benefit of Indigenous and rural communities.

Jurisdiction: National (though the act is not yet in place)

Mechanism of Policy or Framework Implementation: Currently, aquaculture is managed through existing federal-provincial/territorial legislation and regulations, leading to a complicated regulatory system with inconsistent requirements across the country. The intention is for DFO to consolidate all existing aquaculture provisions – currently spread across a number of separate regulations under the Fisheries Act – into a single set of aquaculture-specific regulations. The new aquaculture act would foster the sustainable development of the aquaculture industry, promote healthy aquatic ecosystems, further Indigenous reconciliation, and provide a nationally consistent regulatory system.

Use of Keywords: While the discussion paper doesn't mention blue carbon specifically, many blue carbon ecosystems are also fish habitat where aquaculture could be conducted. As such, provisions under the proposed aquaculture act could potentially apply, and could enhance the environmental prohibitions found under the Fisheries Act. The intention is for the act to prohibit, among other things, the harmful alteration, disruption, or destruction of fish habitat; the deposition of biochemical oxygen-demanding matter, pest control products, drugs, or other harmful chemicals that can harm fish or fish habitat; and the intentional or unintentional introduction of exotic species into Canadian waters. All of the above could negatively impact blue carbon ecosystems. Environmental prohibitions under the proposed act would apply across Canada and be additional to any provincial/territorial requirements. This means that there could be enhanced protections for important fish habitat such as blue carbon ecosystems.

Existing Applicability to Blue Carbon Ecosystems: Not applicable, since the aquaculture act is not yet in place.

Opportunities to Better Incorporate Blue Carbon: The aquaculture act could specifically identify blue carbon ecosystems as areas that may need more careful management due to sensitive features (e.g., eelgrass impacted by higher nutrient loads in the water).

Blue Economy Strategy Engagement Paper and Engaging on Canada's Blue Economy Strategy What We Heard

Date Released: 2021 and 2022

Responsible Authority: Fisheries and Oceans Canada

Policy or Framework Objective: The blue economy strategy aims to grow and modernize Canada's ocean sectors in a sustainable way.

Jurisdiction: National

Mechanism of Policy or Framework Implementation: Unclear, since this is meant to be a strategy. However, it is grounded in the Oceans Act, which authorizes DFO to undertake integrated management of Canada's ocean territory.

Use of Keywords: Blue carbon is mentioned specifically in the strategy, which discusses blue financing investments that support carbon sequestration in blue carbon ecosystems. The strategy also highlights opportunities to support marine science on mitigating and adapting to climate change. It recognizes the value of protecting coasts through nature-based climate solutions, hybrid-engineering solutions and other initiatives. Finally, it supports the identification of new ocean conservation and protection areas.

Existing Applicability to Blue Carbon Ecosystems: Not yet applicable, since the blue economy strategy has not been finalized.

Opportunities to Better Incorporate Blue Carbon: The blue economy strategy is intended to guide Canada's investments and policies toward a single, clear goal of a strong, sustainable blue economy. Blue carbon does feature in this, though the strategy has yet to be completed. The What We Heard document notes that Canada needs strong, modernized legislation and regulations, including the Oceans Act, to enforce marine spatial plans and manage today's ocean issues using marine spatial planning.

Ecologically Significant Areas Framework

Date Released: 2022

Responsible Authority: Fisheries and Oceans Canada

Policy or Framework Objective: Ecologically Significant Areas are intended to be a regulatory, area-based management tool under the updated Fisheries Act. The aim is to protect sensitive, highly productive, rare or unique ecosystems, and to protect fish habitat from activities other than fishing.

Jurisdiction: National freshwater, estuarine or marine environments

Mechanism of Policy or Framework Implementation: Fisheries Act. The act contains provisions to conserve and protect fish and fish habitat by regulating works, undertakings or activities that could result in harmful impacts to fish and fish habitat. Examples of such impacts are the death of fish by means other than by fishing and the harmful alteration, disruption or destruction of fish habitat. Section 35 in particular prohibits harming fish habitat.

Use of Keywords: Ecologically Significant Area designations aim to provide long-term protection and conservation, through regulation, of key areas of fish and fish habitat that are sensitive, highly productive, rare or unique and to ensure effective restoration of these areas when restoration is needed. While not explicitly noted, many blue carbon ecosystems likely meet ESA criteria.

Existing Applicability to Blue Carbon Ecosystems: This framework is still under development. However, it will likely apply to many blue carbon ecosystems as these are key areas of fish and fish habitat that are sensitive, highly productive, rare or unique.

Opportunities to Better Incorporate Blue Carbon: The framework could specifically create a category of Ecologically Significant Areas that are protected or restored because of their importance for carbon storage in addition to their importance as fish habitat.

Environment and Climate Change Canada

The Federal Policy on Wetland Conservation and The Federal Policy on Wetland Conservation Implementation Guide For Federal Land Managers

Date Released: 1991, 1996

Responsible Authority: Environment and Climate Change Canada

Policy or Framework Objective: Policy aims to promote the conservation of Canada's wetlands to sustain their ecological and socioeconomic functions, now and in the future.

Jurisdiction: National

Mechanism of Policy or Framework Implementation: Although the policy is not a regulatory document, the federal cabinet directed that it should be applied to all policies, plans, programs, projects and activities carried out by the federal government. A number of tools can be used to enforce the protection of wetlands, including the Canada Wildlife Act, the Canadian Environmental Protection Act, the Fisheries Act, the Migratory Birds Convention Act, the National Parks Act and the Navigable Waters Protection Act.

Use of Keywords: While the policy doesn't specifically mention blue carbon, it is focused on wetlands, including coastal wetlands such as salt marshes. The policy does note that wetlands serve many important ecological functions, including as a natural storage base for carbon. The policy's goals include maintenance of the functions and values derived from wetlands throughout Canada, no net loss of wetland functions on all federal lands and waters, and enhancement and rehabilitation of wetlands in areas where the continuing loss or degradation of wetlands or their functions have reached critical levels.

Existing Applicability to Blue Carbon Ecosystems: This policy applies only to wetlands, and not to other blue carbon ecosystem types. It aims for "no net loss of wetland functions," recognizing that further degradation of the wetland resource is not acceptable. However, all wetland loss cannot be avoided, so the intention is to avoid loss as a first step, minimize potential impacts, and compensate for loss as a last resort. In some areas of Canada, "no further loss of any remaining wetland area" is prescribed. Impacts and intrusions on wetlands in these regions must be avoided: minimization and compensation cannot be considered as mitigation options in these regions.

Opportunities to Better Incorporate Blue Carbon: The policy could more strongly state that wetland ecosystems have great carbon-storage value, and that we should avoid destroying those that store more carbon, with no offsetting allowed. Offsetting could also focus on restoring degraded wetland habitat. When determining acceptable losses and offsetting, we should consider carbon storage metrics, as not all ecosystems store carbon equally. We also need to ensure that offsetting practices don't result in carbon storage loss.

Pan-Canadian Approach to Transforming Species at Risk Conservation in Canada

Date Released: 2018

Responsible Authority: Environment and Climate Change Canada

Policy or Framework Objective: Recognizing that wildlife populations in Canada continue to decline, this document outlines a new multi-species, ecosystem-based approach for species-at-risk conservation. This approach will produce better conservation outcomes for more species at risk, with increased co-benefits for biodiversity and ecosystems.

Jurisdiction: National, barring Quebec, which has its own legislation (Act Respecting Threatened or Vulnerable Species).

Mechanism of Policy or Framework Implementation: Species at Risk Act. The act aims to prevent wildlife species in Canada from disappearing, to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity, and to manage species of special concern to prevent them from becoming endangered or threatened.

Use of Keywords: Blue carbon or specific habitat types are not mentioned in this document. Rather, the document covers habitat more generally, noting that a multi-species, ecosystem-based approach should be taken rather than a single-species approach. An ecosystem-based approach will maximize the ability to protect and recover species at risk, increase co-benefits for biodiversity and support climate change mitigation and adaptation. Threat-based mitigations can be applied to reduce impacts on species at risk and their critical habitats, and restoration activities might be required to restore biodiversity values.

Existing Applicability to Blue Carbon Ecosystems: Considerations for priority places –geographic areas with high biodiversity values in need of management – can include ecosystems, watersheds and habitats of an appropriate spatial size to

focus conservation efforts. Blue carbon ecosystems likely fit within this definition as areas that could be considered as priority places.

Opportunities to Better Incorporate Blue Carbon: It is unclear if there is a way to incorporate the importance of blue carbon ecosystems more strongly, though perhaps it could be a factor in identifying priority places.

Carbon Pollution Pricing: Options for a Federal GHG Offset System

Date Released: 2019

Responsible Authority: Environment and Climate Change Canada

Policy or Framework Objective: Pricing carbon is a key pillar of Canada's clean growth and climate plan, which has been noted as an effective and affordable way to reduce pollution. This discussion paper sought input on options for a federal greenhouse gas (GHG) offset system that aims to encourage cost-effective domestic GHG emissions reductions or removal enhancements from activities that are not covered by carbon pollution pricing.

Jurisdiction: National

Mechanism of Policy or Framework Implementation: This discussion paper informed the Canadian Greenhouse Gas Offset Credit System Regulations, which came into effect in June 2022 under the Greenhouse Gas Pollution Pricing Act. The design of the Federal GHG Offset Credit System also aligned with the Pan-Canadian GHG Offsets Framework.

Use of Keywords: The federal government is committed to implementing a federal system to put a price on carbon pollution from industry while minimizing competitiveness and carbon-leakage risks. Facilities with emissions above their limit have three options: paying for excess emissions, remitting a compliance unit for each tonne of excess emissions or a combination of both. As a substitute for direct emissions reductions, offset credits can be generated by an offset project, such as increased removals by carbon sinks or avoided emissions from carbon sources. Blue carbon is not mentioned in the document, nor are blue carbon ecosystems such as salt marsh, seagrass or seaweed. However, we assume that sequestration projects could potentially be eligible if they follow an approved Federal Offset Protocol and are approved by Environment and Climate Change Canada. The document mentions other sequestration projects, such as forest sequestration. The document requires proponents to maintain a carbon sink for a specified number of years after the end of a project, and outlines the consequences if the carbon is released back into the atmosphere through intentional or accidental means. The document also discusses credit stacking, whereby credits are issued for the maintenance of multiple ecosystem services by the same project.

Existing Applicability to Blue Carbon Ecosystems:

While it doesn't specifically mention blue carbon, the document does note that credits can be given for biological sequestration projects. These projects need to be vetted through the Federal Offset Protocol and approved by Environment and Climate Change Canada.

Opportunities to Better Incorporate Blue Carbon:

Sequestration projects in blue carbon ecosystems could be included specifically in the Federal Offset Protocol. However, when considering blue carbon ecosystems for offsetting projects, we would need to take into account the amount of carbon they can store, the time it takes to reach target accumulation levels, and unintentional reversals of carbon storage resulting from sea-level rise and/or coastal squeeze.

A Healthy Environment and a Healthy Economy — Canada's strengthened climate plan to create jobs and support people, communities and the planet

Date Released: 2020

Responsible Authority: Environment and Climate Change Canada

Policy or Framework Objective: The federal plan aims to outline an ambitious, credible and progressive vision to achieve Canada's environmental and economic objectives. Climate action and clean growth are seen as cornerstones to restoring employment to pre-pandemic levels.

Jurisdiction: National

Mechanism of Policy or Framework Implementation: The plan builds on the Pan-Canadian Framework on Clean Growth and Climate Change and is underpinned by Canada's commitment to the United Nations Framework Convention on Climate Change (the Paris Agreement). Through this agreement, Canada has committed to a 30 per cent reduction below 2005 levels of greenhouse gas emissions.

Use of Keywords: Blue carbon isn't mentioned specifically in this document. However, it does refer to nature-based climate solutions (NbCS) and the need to conserve, sustainably manage and restore ecosystems that are high in carbon (including wetlands) to avoid releasing more carbon into the atmosphere. The document notes that nature is under threat due to climate change but is also a critical ally in the fight against it, and that NbCS can make a significant and cost-effective contribution to global emissions reductions. It notes that large amounts of carbon are stored in Canada's wetlands and oceans, and that NbCS can increase that storage, keeping harmful emissions out of the atmosphere. In particular, the document highlights that Canada has 24 per cent of the world's wetlands, that restoring wetlands that capture and store carbon is a NbCS, and that natural wetlands have been shown to reduce climate-related flooding costs by as much as 38 per cent, making Canada's communities more resilient to climate change. It also notes that, on average, the benefits of land restoration are 10 times higher than the costs. It is important to build resilience, help communities adapt to climate change, and prepare for climate risks such as flooding, extreme heat and sea-level rise.

Existing Applicability to Blue Carbon Ecosystems: While blue carbon isn't mentioned specifically, the plan does highlight wetland restoration and management as a nature-based solution with both nature and climate benefits. Capturing carbon will reduce overall emissions, support nature's resilience and improve the quality of Canadians' lives. The plan outlines a number of programs that can help manage and protect blue carbon ecosystems, including Canada's targets to protect 25 per cent of lands and waters by 2025 and 30 per cent by 2030, Indigenous-led conservation and Indigenous Guardians programs that provide Indigenous Peoples with greater opportunity to steward and protect their traditional lands and waters, and the Nature Climate Solutions Fund that can be used to restore and enhance wetlands and boost carbon sequestration. Additionally, the Disaster Mitigation and Adaptation Fund is a program tailored to mitigating climate impacts such as flooding, wildfires and drought. In Nova Scotia, funding has been used to restore salt marshes and improve 60 km of dikes, thereby reducing coastal flooding. These measures protect an area that encompasses the homes of tens of thousands of residents, as well as businesses, world heritage sites, Indigenous Peoples and farmland. The document also notes jurisdictional complexities and the need to collaborate with provinces and territories to design and implement new measures to exceed Canada's 2030 target, and to develop pathways to reach net-zero emissions by 2050. The documents note that this work should be done alongside Indigenous communities.

Opportunities to Better Incorporate Blue Carbon: The plan could discuss blue carbon more broadly. It could note that in addition to wetlands, the marine environment contains other ecosystem types that store carbon. It will be important to better manage, conserve and restore these ecosystems.

Climate Science 2050: Advancing Science and Knowledge on Climate Change

Date Released: 2020

Responsible Authority: Environment and Climate Change Canada

Policy or Framework Objective: This is a synthesis of Canadian climate change science and knowledge gaps. It guides science and knowledge producers, holders, and funders to inform climate action planning, investment and implementation. This encompasses natural, social and health science, in addition to Indigenous knowledge systems, and recognizes the need to elevate the role of social and behavioural sciences to inform the transformation needed in Canadian society. An additional objective is to facilitate the mainstreaming of climate change science and knowledge so that these considerations are integrated by default into decision-making in all sectors and communities, as well as into research planning. Knowledge synthesis and mobilization will facilitate this mainstreaming, making these efforts just as important as knowledge generation.

Jurisdiction: National

Mechanism of Policy or Framework Implementation: The report provides a complementary science synthesis to many of the foundational climate change strategies and plans that form Canada's policy backdrop for climate change, including the Pan-Canadian Framework on Clean Growth. It supports Canada's obligations to the United Nations Framework Convention on Climate Change (the Paris Agreement) to undertake climate change research, monitoring and reporting. The report notes that decision-making and action are crucial, but fall outside its scope.

Use of Keywords: Blue carbon is explicitly mentioned in this document, which notes that we need to improve our understanding of carbon capture and storage, as well as our ability to quantify carbon sink potential in coastal areas. Healthy, resilient ecosystems play an essential role in addressing climate change, and we need research to establish a foundational understanding of how climate change impacts Canada's biodiversity and ecosystems. We need to explore ways to help Canada's species and ecosystems adapt to climate change challenges, drawing on the synergies between western science and Indigenous stewardship. The document highlights the importance of protecting and enhancing carbon

sinks (in particular wetlands), and the need to better understand and estimate the impacts of climate change and human activity on carbon stocks and GHG fluxes, particularly at a regional scale, given the slow natural uptake of carbon and the potential for its fast release in the event of a disturbance. This work must be paired with applied research on regional and local mitigation best practices and actions, including the conservation of carbon-rich areas, the use of macroalgal crops in the ocean, the protection of natural kelp and eelgrass beds, and the creation of protected areas and Indigenous protected and conserved areas. Nature-based solutions feature prominently in the document. These can address the interrelated challenges of climate change and biodiversity loss, while also providing a range of co-benefits. For example, restoring wetland, macroalgal and eelgrass ecosystems can increase carbon storage and/or build resilience. It was also noted that expanding protected area networks contributes to nature-based solutions, in addition to improving the adaptive capacity of species, ecosystems and landscapes (e.g., by providing climate refugia, landscape connectivity). Expanding protected areas must be done in a way that protects Indigenous rights and is integrated with work on Indigenous protected and conserved areas. Additional research is needed to evaluate the effectiveness of nature-based solutions for conservation priorities (e.g., addressing biodiversity loss) and to better understand ecosystems' potential to mitigate climate change. This research could include developing, testing, monitoring and evaluating nature-based solutions to better understand the trade-offs and opportunities to maximize co-benefits. The impact of climate change on wetlands and macroalgal/eelgrass beds was highlighted as an important knowledge gap.

Existing Applicability to Blue Carbon Ecosystems: This document has great applicability to blue carbon ecosystems. In the document's own words, "Sustained, synthesized, and inclusive science and knowledge will allow us to understand what is in store for Canada and the world, assess the risks, take informed and ambitious action, and track our progress against set milestones."

Opportunities to Better Incorporate Blue Carbon: This document provides an excellent synthesis of current knowledge and an overview of gaps and knowledge needs. However, it does not necessarily lead to decision-making and action as they are outside the scope of the report.

Adapting to the Impacts of Climate Change in Canada: An Update on the National Adaptation Strategy

Date Released: 2021

Responsible Authority: Environment and Climate Change Canada

Policy or Framework Objective: Canada aims to develop a national adaptation strategy that will help the country respond and adapt to the impacts of climate change.

Jurisdiction: National

Mechanism of Policy or Framework Implementation: The strategy will build on the Pan-Canadian Framework on Clean Growth and Climate Change. It will encourage action on climate adaptation that is cross-cutting and complementary to adaptation strategies led by provinces, territories, local governments, Indigenous Peoples and others.

Use of Keywords: This update outlines federal actions on climate change adaptation and resilience to date, including significant investments in restoring wetlands and shorelines. Though blue carbon is not mentioned specifically, additional funding through the Disaster Mitigation and Adaptation Fund could be used to restore blue carbon ecosystems in order to mitigate climate impacts.

Existing Applicability to Blue Carbon Ecosystems: Though the national adaptation strategy is not yet complete, the Government of Canada is already funding programs to improve resiliency and restore function to coastal wetlands and other blue carbon–related projects.

Opportunities to Better Incorporate Blue Carbon: The finalized strategy could include blue carbon more specifically. It could note the importance of protecting and restoring these ecosystems because they capture and store carbon, and because they mitigate climate change impacts (e.g., wave attenuation and shoreline stabilization).

Guidelines to Avoid Harm to Migratory Birds

Date Released: 2021

Responsible Authority: Environment and Climate Change Canada

Policy or Framework Objective: Guidelines aimed at providing information on the risks certain activities might pose to migratory birds and how to avoid and reduce these risks.

Jurisdiction: National

Mechanism of Policy or Framework Implementation: Migratory Birds Regulations under the Migratory Birds Convention Act. The act and its regulations aim to protect and conserve migratory birds – as populations and individual birds – as well as their nests.

Use of Keywords: While the guidelines don't mention blue carbon specifically, they do note that wetlands provide important habitat for migratory birds, and that migratory bird nests or eggs can be harmed by activities such as clearing vegetation and draining or flooding land. The guidelines aim to minimize projects' impacts on migratory birds – mainly by timing of activities to avoid nesting season – rather than totally avoiding modifying or impacting the habitat itself.

Existing Applicability to Blue Carbon Ecosystems: These guidelines potentially apply to all types of blue carbon ecosystems as these provide habitat for migratory birds. However, they only specifically mention wetlands.

Opportunities to Better Incorporate Blue Carbon: The guidelines could more strongly prevent the destruction of habitat rather than focusing on mitigatory measures to protect migratory birds (i.e., scheduling projects outside of nesting season, but potentially destroying the habitat in the long term).

Strategic Assessment of Climate Change

Date Released: 2021

Responsible Authority: Environment and Climate Change Canada

Policy or Framework Objective: This document will enable consistent, predictable, efficient and transparent consideration of climate change throughout the impact assessment (IA) process. It requires proponents of projects undergoing the IA process with a lifetime beyond 2050 to provide a credible plan to achieve net-zero emissions by 2050.

Jurisdiction: National – all designated projects under the Impact Assessment Act (IAA).

Mechanism of Policy or Framework Implementation: The principles and objectives underlying the strategic assessment of climate change will be built into guidance for the review of non-designated projects on federal lands and outside Canada under the IAA. Guidance for projects regulated by the Canada Energy Regulator will similarly consider the principles and objectives of the strategic assessment of climate change. This strategic assessment may also apply to environmental reviews by other federal lifecycle regulators and be used in regional assessments.

Use of Keywords: The policy does not mention blue carbon or related habitats specifically; however, blue carbon ecosystems could be assessed during the greenhouse gas net emission assessment for all projects. The policy mentions impact to carbon sinks mainly through terrestrial ecosystems, which could be measured through initial carbon stocks in living biomass, dead biomass and soils (by ecosystem type). There is also a note that adaptation and resilience are pillars of the Pan-Canadian Framework on Clean Growth and Climate Change.

Existing Applicability to Blue Carbon Ecosystems: Guidelines used to assess a project's net carbon emissions can be implemented in blue carbon ecosystems (i.e., net greenhouse emissions calculation). This includes the assessment of direct greenhouse gas emissions, carbon dioxide captured and stored, avoided domestic greenhouse gas emissions, and offset credits.

Opportunities to Better Incorporate Blue Carbon: Policy could refer to aquatic/blue carbon ecosystems when assessing net greenhouse gas emissions for projects.

Achieving a Sustainable Future: Draft Federal Sustainable Development Strategy 2022 to 2026

Date Released: 2021

Responsible Authority: Environment and Climate Change Canada

Policy or Framework Objective: This document sets out the Government of Canada's sustainable development goals and targets, and outlines implementation strategies and short-term milestones. The strategy focuses on the environmental aspects of the Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda. The strategy aims to promote a clean environment and tackle the crises of climate change and biodiversity loss by transitioning to net-zero carbon and climate-resilient operations by 2050.

Jurisdiction: National

Mechanism of Policy or Framework Implementation: This is the first federal development strategy to be developed under an amended Federal Sustainable Development Act. It improves accountability through time-bound targets and milestones as well as whole-of government participation across 99 federal organizations. By focusing on the environmental aspects of the SDGs, the document highlights the environment as a critical component of sustainable development in the context of the climate crisis, biodiversity loss, and other urgent environmental challenges facing Canada and the world. It also shows how environmental issues interact with economic and social issues such as poverty, education and gender equality. In keeping with the broadened focus of the strengthened Federal Sustainable Development Act, this document aims to address themes that cut across the environmental aspects of social and economic SDGs. For example, it seeks to support sustainable food production, enhance food security in Indigenous and northern communities, promote gender equality in the clean-technology sector, and finance low-carbon, climate-resilient development in low- and middle-income countries.

Use of Keywords: The strategy does not mention blue carbon. It does discuss nature-based climate solutions (NbCS), natural infrastructure such as wetlands and marshes, and the conservation and recovery of wild species, including species at risk. A section on eelgrass in Canada notes that eelgrass is an ecosystem engineer that creates habitat and resources for other species. While this section does not mention the eelgrass's carbon storage potential, other sections discuss carbon storage in agricultural soils. The strategy notes that Canada needs to adapt to the changing climate by building resilience and reducing vulnerability to foreseeable impacts in communities, regions, ecosystems and economic sectors. It notes that taking adaptation actions today can reduce costs and overall impacts on health and well-being. It recognizes that NbCS help mitigate and adapt to climate change while providing benefits for biodiversity, nature conservation and human health. The government will implement legislation and regulations to protect coasts and oceans, work with partners to protect and restore coastal and marine ecosystems, and foster opportunities for ongoing collaboration with domestic and international partners to protect and restore marine ecosystems.

Existing Applicability to Blue Carbon Ecosystems: The document links to associated projects – proposed or underway – that are relevant to the management, protection and/or restoration of blue carbon ecosystems. These include the National Adaptation Strategy, green bonds, the Natural Climate Solutions Fund, the Natural Infrastructure Fund, a renewal and expansion of the Coastal Restoration Fund, a modernization of the Oceans Act, and Canada's commitments to protect marine and coastal areas.

Opportunities to Better Incorporate Blue Carbon: Blue carbon could be more specifically addressed with regards to better management, protection and/or restoration of these ecosystems.

Canada's 2030 Emissions Reduction Plan

Date Released: 2022

Responsible Authority: Environment and Climate Change Canada

Policy or Framework Objective: The 2030 plan is designed to be a comprehensive roadmap that guides emissions-reduction efforts in each sector. As governments, businesses, non-profits and communities across the country work together to reach targets, Canada will identify and respond to new opportunities. The plan uses economic modelling to show a pathway to achieving Canada's 2030 target. It includes the potential for each sector of the economy to reduce emissions by 2030.

Jurisdiction: National

Mechanism of Policy or Framework Implementation: Through the plan, the Government of Canada is working to reduce energy costs for homes and buildings, empower communities to take climate action, help Canadians switch to electric vehicles, reduce carbon pollution from the oil and gas sector, power the economy with renewable electricity, help industries develop and adopt clean technology, invest in nature and nature-based climate solutions, support farmers as partners in building a clean future, and maintain Canada's approach for pricing pollution. Canada's emissions reduction plan for 2030 and pathway to 2050 include economy-wide strategies, clean technology and climate innovation, sustainable finance and skills, and people-centred transition.

Use of Keywords: The plan specifically mentions blue carbon as a nature-based climate solution (NbCS). The Government of Canada has committed to reducing emissions through various means, with NbCS being a key component. As an example of a NbCS, the plan mentions protecting and restoring wetlands. Under "next steps," the plan notes blue carbon's mitigation potential. The plan also states that the Government of Canada is positioned to succeed in the fast-growing global ocean sectors of the blue economy; and to advance reconciliation, conservation and climate objectives.

Existing Applicability to Blue Carbon Ecosystems: The plan recognizes the protection of blue carbon ecosystems as a vital NbCS that will ultimately reduce carbon emissions. Currently, the plan only specifically mentions the protection of wetlands. However, it provides insight on the mitigation potential of other blue carbon ecosystems, such as tidal wetlands, riparian habitats and seagrass meadows.

Opportunities to Better Incorporate Blue Carbon: The plan could formally recognize other blue carbon ecosystems and specify measures to protect them.

Infrastructure Canada

Building the Canada We Want in 2050: Engagement on the National Infrastructure Assessment

Date Released: 2021

Responsible Authority: Infrastructure Canada

Policy or Framework Objective: To identify the needs and priorities for Canada's infrastructure, and a plan for net-zero emissions future by 2050.

Jurisdiction: National

Mechanism of Policy or Framework Implementation: The assessment aims to determine the needs and priorities for the country's infrastructure investments. The focus is on promoting economic growth, job creation and competitiveness, tackling climate change and increasing resilience, and improving social inclusion and quality of life for all Canadians. Funds for this infrastructure would come from the federal budget. Depending on the project, various legislations could apply, from the Impact Assessment Act to approvals from the Species at Risk Act and Fisheries Act.

Use of Keywords: While blue carbon is not mentioned directly in the assessment, climate change does feature heavily. The Government of Canada has committed to net-zero emissions by 2050, and one of the priority areas for the federal infrastructure program is green infrastructure. The assessment will consider how natural disasters impact infrastructure, and how to mitigate or prevent impacts of future climate risk through infrastructure. It does note the value of nature, including wetlands as carbon sinks, the value of natural infrastructure to mitigate natural disasters, and Canada's commitment to nature-based climate solutions (NbCS).

Existing Applicability to Blue Carbon Ecosystems: This engagement paper recognizes that natural infrastructure can be used to mitigate natural disasters. This could potentially lead to the restoration or creation of blue carbon ecosystems to provide additional coastal protection or resilience.

Opportunities to Better Incorporate Blue Carbon: The National Infrastructure Assessment could recognize that some infrastructure developments lead to the destruction of blue carbon ecosystems, and that these ecosystems should be preserved and/or restored instead of further degraded.

Transport Canada

Ports Modernization Review: Discussion Paper

Date Released: 2018

Responsible Authority: Transport Canada

Policy or Framework Objective: To review Canada Port Authorities so they are better able to promote sustainable and inclusive economic growth through effective governance and innovative operations.

Jurisdiction: Eighteen Canada Port Authorities, including Vancouver Fraser, Prince Rupert, Nanaimo, Montreal, Saint John, Halifax and St. John's.

Mechanism of Policy or Framework Implementation: The 1995 National Marine Policy and 1998 Canada Marine Act form the basis for the port system. The act placed federal ports of national significance on a commercial footing by creating 18 Canada Port Authorities, which are arms-length corporations that run Canada's ports of strategic importance.

Use of Keywords: This document does not mention blue carbon or any specific ecosystems. However, a key driver of the review of Canada Port Authorities is the need to protect the environment and address climate change. The review focuses on how ports can best advance five key objectives, including promoting environmentally sustainable infrastructure and operations. The paper notes that ports must do their share to better protect the environment and serve as environmental stewards. Canada Port Authorities need to add environmental and sustainable-development practices and oversight into their governance structures and focus on protecting marine species. In particular, the report asks how ports can ensure that their operations and future development remain environmentally sustainable and adaptive to climate risks.

Existing Applicability to Blue Carbon Ecosystems: Port Authorities manage coastal and nearshore environments in 18 locations across the country. They thus potentially impact the quality and extent of adjacent coastal blue carbon ecosystems, though this is not explicitly mentioned in the paper.

Opportunities to Better Incorporate Blue Carbon: Objectives of the review of Canada Port Authorities include the need to promote environmental sustainability and adaptation to climate risks. Ports could better recognize their role in improving environmental quality around ports and in stewarding adjacent blue carbon ecosystems. They could institute no-loss policies to ensure that port expansion does not destroy these coastal ecosystems.

Impact Assessment Agency of Canada

Practitioner's Guide to Federal Impact Assessments

Date Released: 2021

Responsible Authority: Impact Assessment Agency of Canada

Policy or Framework Objective: Comprehensive framework and policy guidance for practitioners taking part in a federal environmental-impact assessment.

Jurisdiction: National; all projects that fall under the purview of federal impact assessment.

Mechanism of Policy or Framework Implementation: This framework draws its authority from the Impact Assessment Act of Canada (IAAC). The IAAC aims to foster sustainability and to protect the environment from adverse effects. The framework also explicitly references the Fisheries Act, the Species at Risk Act (SARA) and the Migratory Birds Convention Act.

Use of Keywords: This document does not explicitly include blue carbon; however, it does refer to fish habitat, SARA-listed marine plants, and migratory birds. It also refers to climate impacts and greenhouse gas emissions, and notes that adaptation and resilience are pillars of the Pan-Canadian Framework on Clean Growth and Climate Change.

Existing Applicability to Blue Carbon Ecosystems: This guide applies to blue carbon ecosystems in the assessment of both environmental and climate impacts. Initial and detailed project descriptions must include a list of anticipated changes to fish and fish habitat under the Fisheries Act, to aquatic species under SARA (marine plants), and to migratory birds under the Migratory Birds Convention Act, all of which could impact blue carbon ecosystems. In the context of sustainability guidance, the guide notes the requirement to identify "valued components" that could be impacted by a project; these valued components could certainly be components of blue carbon ecosystems. There is also guidance on evaluating the extent to which a project will help or hinder the Government of Canada's ability to meet its international and domestic commitments to the environment and climate change, as a factor in deciding the public interest value of a project. Though not explicitly mentioned, the disturbance of carbon stored in a blue carbon ecosystem would be relevant to climate commitments. Blue carbon could also be relevant to Canada's commitments to the United Nations SDGs.

Opportunities to Better Incorporate Blue Carbon: The IAAC and this guide embrace the precautionary principle, which is particularly important given the current lack of policy guidance for blue carbon ecosystems. Since this high-level guide refers directly to other statutes (Fisheries Act, SARA, Migratory Birds Convention Act) for ecosystem components and function, and to more specific guidance on climate impacts (Strategic Assessment of Climate Change), it may be more effective for those frameworks to ensure the meaningful inclusion of blue carbon.

Government of Canada

Pan-Canadian Framework on Clean Growth and Climate Change

Date Released: 2016

Responsible Authority: Government of Canada, all provinces, and territories except Saskatchewan

Policy or Framework Objective: Provides a plan to grow Canada's economy while reducing emissions and building resilience to adapt to a changing climate.

Jurisdiction: National, though Saskatchewan chose not to adopt the Pan-Canadian Framework.

Mechanism of Policy or Framework Implementation: United Nations Framework Convention on Climate Change (the Paris Agreement). Through this agreement, Canada has committed to a 30 per cent reduction below 2005 levels of greenhouse gas emissions.

Use of Keywords: Pricing carbon is central to the framework, combined with measures to further reduce emissions across the economy. Also important are measures to adapt to climate change impacts and build resilience, to accelerate innovation, to support clean technology and to create jobs. The framework notes that governments will work together to

protect and enhance carbon sinks through land-use and conservation measures. While the framework largely focuses on enhancing carbon storage in forests and agricultural lands, it notes that wetlands absorb and store atmospheric carbon, and that protecting and restoring natural areas can benefit biodiversity and maintain or enhance carbon storage. The framework also calls for an investment in infrastructure projects that strengthen climate resilience, which can include constructed or managed wetlands.

Existing Applicability to Blue Carbon Ecosystems: The framework does highlight the use of protecting and/or restoring some blue carbon ecosystems, namely wetlands, but is largely silent on ecosystems beyond wetlands.

Opportunities to Better Incorporate Blue Carbon: The framework could provide firm metrics for the emissions reductions the government would like to see as a result of protecting carbon stored in nature or restoring degraded blue carbon habitats.

Arctic and Northern Policy Framework

Date Released: 2016

Responsible Authority: Government of Canada

Policy or Framework Objective: To create a future in which the people of the Arctic and North are full participants in Canadian society, with access to the same services, opportunities and standards of living enjoyed by other Canadians. This ambition will require greater effort, focus, trust and collaboration amongst partners.

Jurisdiction: National

Mechanism of Policy or Framework Implementation: Canada will work collaboratively with Indigenous Peoples and territorial and provincial governments in the multilateral forums where decisions that impact the Arctic are made, including the Arctic Council and United Nations organizations. Canada will enhance bilateral cooperation with Arctic and key non-Arctic states and actors. The framework's goals relate to healthy and resilient northern Indigenous Peoples and ecosystems, diversified regional economies, safety and security of northern communities, and self-determination and reconciliation.

Use of Keywords: While the framework does not mention blue carbon specifically, it mentions approaches that could be applied blue carbon conservation. These approaches include sustainable and holistic development that integrates social, cultural, economic and environmental considerations. Goal 5 focuses on ensuring that Canadian Arctic and northern ecosystems are healthy and resilient, and notes that urgent action is needed to mitigate the impacts of climate change, adapt to its current and future impacts, and build resilience. Goal 5 also seeks to accelerate and intensify national and international reductions of greenhouse gas emissions and short-lived climate pollutants. It seeks to ensure conservation, restoration and sustainable use of ecosystems and species, and supports sustainable use of species by Indigenous Peoples. Finally, it aims to partner with territories, provinces and Indigenous Peoples to recognize, manage and conserve culturally and environmentally significant areas.

Existing Applicability to Blue Carbon Ecosystems: The framework applies to blue carbon ecosystems in the context of protecting ecologically significant areas/critical ecosystems from various impacts, including climate change impacts.

Opportunities to Better Incorporate Blue Carbon: The strategy could be updated to explicitly identify the types of ecosystems in need of management, restoration and/or protection. Integrated management and protection could focus on protecting these ecosystems against climate change.

Canada's Pathway to Target 1 Report: One with Nature — a renewed approach to freshwater and land conservation in Canada

Date Released: 2018

Responsible Authority: Executive governance provided by federal, provincial (excluding Quebec) and territorial ministers, deputy ministers and assistant deputy ministers for parks, protected areas, conservation, wildlife and biodiversity.

Policy or Framework Objective: The Pathway to Target 1 presents pan-Canadian opportunities jointly developed by federal, provincial and territorial governments to support progress towards achieving the terrestrial and inland water components of Canada Target 1.

Jurisdiction: National terrestrial, freshwater and wetland ecosystems, barring Quebec which has developed its own instruments to implement the United Nations Convention on Biological Diversity.

Mechanism of Policy or Framework Implementation: As a signatory to the Convention on Biological Diversity (CBD), Canada has committed to protecting at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas by 2020. Post 2020 CBD targets have yet to be fixed, but will likely be 30 per cent of terrestrial and marine areas by 2030. Implementation of these protected areas is through a wide variety of legislative tools and may include other effective area-based conservation areas, Indigenous Protected and Conserved Areas, and privately protected areas. Canada created the 2020 Biodiversity Goals and Targets for Canada, with Canada Target 1 also aiming to protect at least 17 per cent of terrestrial areas and inland water and 10 per cent of marine and coastal areas by 2020.

Use of Keywords: While the report does not mention blue carbon specifically, it does highlight the importance of protected areas in safeguarding ecosystems and wildlife habitat in addition to mitigating and adapting to the effects of climate change. It also recognizes the role of representative and effective networks of protected areas as nature-based solutions to the climate crisis and biodiversity loss. However, it does not specifically mention the importance of protecting carbon-rich ecosystems.

Existing Applicability to Blue Carbon Ecosystems: The Pathway to Target 1 is specifically for terrestrial, freshwater and wetland ecosystems. As blue carbon ecosystems are often found in the junction between terrestrial and marine environments, jurisdiction for these ecosystems is often unclear. It is likely that these ecosystems need a combination of marine and coastal protection, and the pathway does aim to develop a pan-Canadian approach to expanding the system of protected areas.

Opportunities to Better Incorporate Blue Carbon: The report does call for cooperation across jurisdictional boundaries, but could specifically include blue carbon ecosystems as an example. Many blue carbon ecosystems occur in intertidal areas that may span federal, provincial/territorial and municipal jurisdictions. Cooperation will likely be needed to effectively manage and protect these ecosystems and maximize conservation outcomes.

Government of Canada Green Bond Framework

Date Released: 2022

Responsible Authority: Government of Canada

Policy or Framework Objective: The framework allows investors to support Canadian investments in climate action and environmental protection, while fostering further development of the Canadian sustainable finance market.

Jurisdiction: National

Mechanism of Policy or Framework Implementation: The Government of Canada intends to allocate an amount equal to the net proceeds of any green bonds issued to finance and/or refinance, in whole or in part, expenditures that meet any of the environmental eligibility criteria set out in this framework. The expenditures must not cause significant harm to any of the priorities identified in Section 1.1 of the framework (e.g., pricing carbon pollution, complementary measures to further reduce emissions across the economy, adaptation and climate resilience, and clean technology, innovation and jobs).

Use of Keywords: While the report does not mention blue carbon specifically, it does highlight the importance of working towards a carbon-neutral environment. It notes that nature-based climate solutions (NbCS) can help Canada reach 2030 and 2050 climate change targets; these include the use of certain ecosystems to sequester carbon (e.g., wetlands). Additionally, green bond projects could include work that restores and enhances ecosystems such as wetlands and peatlands.

Existing Applicability to Blue Carbon Ecosystems: Framework guidance is applicable to nature-based climate solutions. These NbCS apply to specific carbon-sequestering ecosystems, including wetlands and peatlands, and to restoration and enhancement of these ecosystems. The framework does not specify other blue carbon ecosystems.

Opportunities to Better Incorporate Blue Carbon: The report does indirectly mention the importance of blue carbon ecosystems (e.g., wetlands) in sequestering carbon, but could specifically mention blue carbon ecosystems and their conservation as a priority. A specified amount of green bonds could be earmarked for blue carbon ecosystems. This would further their protection and conservation, and support initiatives to reduce carbon emissions.

Indigenous Circle of Experts

We Rise Together: Achieving Pathway to Canada Target 1 through the creation of Indigenous Protected and Conserved Areas in the spirit and practice of reconciliation

Date Released: 2018

Responsible Authority: Indigenous Circle of Experts (ICE)

Policy or Framework Objective: To identify and manage Canada's entire system of protected and conserved areas in partnership with Indigenous governments, consistent with the principle of Free Prior and Informed Consent as expressed in the United Nations Declaration on the Rights of Indigenous Peoples.

Jurisdiction: National

Mechanism of Policy or Framework Implementation: ICE comprises Indigenous and non-Indigenous citizens of Canada who have worked together to make progress on Pathway to Canada Target 1. Indigenous Protected and Conserved Areas (IPCAs) are lands and waters where Indigenous governments have the primary role in protecting and conserving ecosystems through Indigenous laws, governance and knowledge systems. The result of IPCAs is biodiversity conservation and healthier ecosystems, which in turn benefit all Canadians in the form of clean air and water, improved human health, and the mitigation of risks from climate change and disease.

Use of Keywords: Although blue carbon ecosystems are not explicitly included, this report notes that "Indigenous Peoples see the land and water as inseparable when it comes to stewardship and conservation. In this report, any references to land should be assumed to include water." IPCAs could also serve as "restoration areas" where lands and waters can heal from serious ecosystem breakdowns caused by industrial and human development.

Existing Applicability to Blue Carbon Ecosystems: This report mentions the creation/management of IPCAs, which could also encompass guidelines to protect blue carbon ecosystems. It is noted that IPCAs should conserve cultural keystone species and protect food security; blue carbon ecosystems can encompass both keystone species and food sources. Similar processes can be followed to protect blue carbon ecosystems.

Opportunities to Better Incorporate Blue Carbon: Indigenous-led approaches and perspectives on conservation of blue carbon ecosystems can be assessed and implemented. As the report states, "Indigenous wisdom and knowledge are embedded in Indigenous practices for managing complex ecosystems and for addressing conservation- and protection-related challenges. However, protected and conserved areas in Canada are still established and managed based largely on western science and knowledge."

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