



# **A FRAMEWORK FOR BLUE CARBON IN CANADA'S ARCTIC COASTAL ECOSYSTEMS**

**DISCUSSION PAPER PHASE 1 - NORTH OF 60° ECOSYSTEMS;  
FEDERAL, TERRITORIAL, PROVINCIAL LAWS AND POLICIES**

*Husky Lakes, Inuvialuit Settlement Region. Credit: Kate Darling, 2019*

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# EXECUTIVE SUMMARY: PHASE 1 DISCUSSION PAPER

This Discussion Paper contributes an Arctic perspective on the evolving science, laws, policies and strategies that may be employed to support to blue carbon sequestration in Canada. The analysis that follows intends to complement to two highly informative papers previously prepared for World Wildlife Fund - Canada: *Atlantic Canada Blue Carbon Legislative & Policy Review* (2022), prepared by East Coast Environmental Law, and, *Policy and Planning for Coastal Ecosystems in British Columbia through a Blue Carbon Lens* (2020), prepared by West Coast Environmental Law.

## A two-phased approach to this Discussion Paper

This Discussion Paper is being developed in two phases:

**Discussion Paper Phase 1 – North of 60° Ecosystems; Federal, Territorial, Provincial Laws and Policies:** The present document draws on available literature and data to describe the characteristics of and conditions facing blue carbon ecosystems along Canada’s northernmost coastlines. Current federal, provincial and territorial laws, regulations and policy measures in Yukon, Northwest Territories, Nunavut, Quebec, Manitoba and Ontario relevant to the integrity of blue carbon ecosystems are also outlined in the pages that follow.<sup>1</sup>

**Discussion Paper Phase 2 – Hudson and James Bay Ecosystems; Northern Treaties, Indigenous Rights and Environmental Management Frameworks:** The second phase of work will inquire into blue carbon ecosystems found in southern Hudson Bay and James Bay. Discussion Paper Phase 2 will also analyse the rights, governance and management structures under the five Inuit-Crown treaties that span the four Inuit regions of Inuit Nunangat<sup>2</sup> as well as Treaty 5 and Treaty 9 in Northern Manitoba and Northern Ontario respectively. Finally, it will analyse key conservation measures established and Impact and Benefit Agreements entered into pursuant to these treaties with a view to assessing their potential impact on blue carbon sequestration initiatives in the Arctic.

Though these topics are addressed sequentially, they are absolutely interdependent. Existing Indigenous and treaty rights – including, for the purposes of the present analysis, those rights incorporated into the five Inuit-Crown treaties, Treaty 5, and Treaty 9 – are recognized, affirmed and protected under section 35 of the *Constitution Act, 1982*. While federal, territorial and provincial legislation may govern aspects of blue carbon ecosystems as described in this Phase 1, the application of these laws may be limited in some cases by existing Indigenous and treaty rights. Consequently, a comprehensive framework and set of recommendations for the support of blue carbon ecosystems in Canada’s Arctic will only emerge when Phases 1 and 2 are read together.

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1. Though portions of Newfoundland and Labrador territory lies in the Arctic, this jurisdiction was thoroughly assessed in the ECELAW paper. As such, it is not reviewed here.

2. Inuit Nunangat encompasses the four Inuit regions recognized in their respective modern treaties. These regions are the Inuvialuit Settlement Region, Nunavut, Nunavik and Nunatsiavut. These regions overlap with parts of Yukon, Northwest Territories, Quebec, Newfoundland and Labrador and all of Nunavut.

## **Arctic blue carbon ecosystems**

While images of land fast ice and blowing snow do not readily bring to mind flourishing kelp forests, eelgrass and marshland, there is evidence that Canada's extensive Arctic coast is host to significant blue carbon ecosystems. Blue carbon ecosystems such as kelp, eelgrass, and salt marshes line the Canadian Arctic coastline, sequestering vast quantities of carbon. These efforts are aided by other coastal Arctic ecosystems and organisms, not traditionally considered blue carbon ecosystems, such as phytoplankton and certain types of algae, as well as the unique geography of the Arctic. However, more research is required to quantify the mass and potential of these ecosystems to sequester carbon, the threats to these sequestered stores and how they can contribute to climate change mitigation.

Organisms such as phytoplankton, algae, including ice algae and macroalgae, and eelgrass significantly contribute not only carbon sequestration and storage within the Arctic, but also serve a host of ecosystems services, some of which include defence from coastal erosion and protection of coastal community infrastructure, support food security for Indigenous communities, facilitate improved species health and biodiversity, and facilitate climate mitigation. Threats to these services, including their ability to sequester and store carbon, include global climate change and the resulting changes in ocean dynamics, including warming waters, ocean freshening and acidification, sea ice and glacial melt, coastal erosion, and permafrost melt, all of which are intensified by human exploration and exploitation of the Arctic.

Despite the importance and magnitude of blue carbon within the Arctic, large data gaps exist regarding the biomass, extent, distribution, carbon uptake and storage of these organisms within the Canadian Arctic. Research in the Arctic is limited by accessibility due to harsh environment and weather conditions, isolated geographic location, limited infrastructure and equipment, and limited perceived importance by a portion of the western scientific community. This is especially true in the High Arctic Canadian Archipelago. For further summary information on the known distributions of blue carbon ecosystems along the Canadian Arctic coast please see the *Catalogue of Blue Carbon Ecosystems* on page 14.

The valuation of blue carbon and blue carbon ecosystems within the Canadian Arctic is vital to their proper management and survival. Understanding the full extent and present biomass of the discussed ecosystems along the entire Canadian Arctic coastline is a necessary first step in determining their current and future capacity to contribute to climate mitigation and carbon sequestration. To appropriately manage and create effective "Nature Based Solutions" (NbCS), more comprehensive investment in research regarding the full extent and biomass, carbon sequestration, and vulnerabilities of these coastal Arctic ecosystems is necessary.

Indigenous Peoples leadership, priorities, knowledge, and rights must be at the forefront of any and all steps in the research, decision and policy making, and management of these areas. This will facilitate the co-production of the most comprehensive and useful knowledge, support reconciliation, equity in knowledge acquisition and decision making, as well as promote sustainable and effective conservation.

## **Federal, Provincial and Territorial Laws, Regulations and Policy Measures**

Similar to the findings in the ECELAW and WCELAW papers, tools do exist within federal, provincial and territorial laws and policies that could be used to support blue carbon sequestration initiatives. However, protections rely heavily on the blue carbon ecosystem performing the function of habitat for protected fish, wildlife, or migratory birds, not acknowledging their climate mitigation abilities and other ecosystem services, including coastal and community protection, increased food security of local communities, and improved water and air quality. In other words, blue carbon ecosystems are not assigned a value and are not therefore protected specifically for their sequestration potential. Also similar to the dynamic observed on the Pacific and



Atlantic coasts, the bifurcation of jurisdiction between the federal government and provinces and territories at the onshore-offshore divide complicates governance and strategy in this area.

The jurisdictional landscape does offer some unique opportunities for blue carbon ecosystem protection, however. Unlike the provinces, each territory's law-making powers are delegated to them through federal statute. Devolution of such powers has occurred periodically since the establishment of the territories and continues to be negotiated today. While there are no recent instances of the federal government recalling or modifying a delegated power, it is legally possible. There is likely a more fruitful route, however. The transfer of powers has led to legislative renewal initiatives in the areas of land and resources, which may allow for targeted approaches to blue carbon sequestration. A growing openness to the concept of sequestration can be seen at the policy and administrative levels – likely where scientists are able to contribute directly. This information now needs to flow upward to lawmakers.

Also distinct in terms of opportunities, thanks to the foresight and Inuit communities and to early conservation efforts, large-scale parks, marine protected areas and migratory bird sanctuaries line the coastlines and offer spaces where plant life is generally protected. Migratory bird sanctuaries in particular span the terrestrial marine divide, reflecting the habitat on which the birds that frequent those places rely. These spaces, which are already set aside, present an opportunity to define in law that blue carbon is a valued component and a valid objective of the conservation measure.

As noted above, this Discussion Paper Phase 1 is not the complete picture by any means. Any blue carbon strategy will require partnership with Indigenous representative and co-management organizations and coherence with the Inuit-Crown and Historic Treaties that span this region. Success will also depend on a thorough understanding of the conservation measures that have already been established within the constitutionally protected rights and regulatory frameworks within treaties. The intention is to address this in a Phase 2 Discussion Paper.

### **Phase 1 Discussion Paper – Key Takeaways**

Although a comprehensive framework for blue carbon ecosystem support will only emerge following the completion of Phase 2 of this Discussion Paper, a number of takeaways are worth noting at this midway point.

- Inuit Nunangat, Hudson Bay and James Bay host the vast majority of Canada's coastline and the productive aquatic ecosystems that occur there. Despite gaps in existing western science, this region will be an important element in any blue carbon strategy.
- Indigenous Peoples, priorities, leadership, knowledge, values, and ways of life must be at the forefront of any and all research and management measures that take place within or affect the Arctic. Indigenous led conservation and the co-production of knowledge facilitates effective ecological stewardship and the creation of the most comprehensive knowledge.
- Phytoplankton and microalgae play a vital role in the carbon sequestration, ocean dynamics, and food webs of the Arctic Ocean.
- There is evidence of extensive kelp biomass along the Canadian Arctic coast, particularly within the Eastern Canadian Arctic, Hudson Bay, and the Kitikmeot region. Evidence suggests kelp could inhabit the high Arctic Canadian coast; however, research regarding kelp biomass in the region is scarce.
- Emerging research regarding the extent of salt marsh within the Canadian Arctic shows that 63% of

Canada's mapped salt marsh is located along the Arctic coast, mainly along the coast of Hudson's Bay. This reality may not align with how this zone is characterized in the minds of researchers, policymakers and legislators, which may affect priority-setting in these areas.

- Eelgrass meadows have been observed near settlements in the Northwest Territories and Nunavut, with the most northern observation at Grise Fiord in Nunavut in the Eastern Arctic.
- There are extensive knowledge gaps in western science regarding coastal ecosystems along the Canadian Arctic coast, especially in the Arctic basin and Canadian Arctic Archipelago. These gaps not only relate to the extent and biomass of coastal ecosystems, but also the standing carbon stocks, rates of carbon sequestration, and rates of carbon export and burial of these coastal ecosystems. All of which are imperative to create accurate and appropriate valuations and management decisions.
- Climate change and increased accessibility to Arctic lands and waters present opportunities and challenges to coastal blue carbon ecosystems. Climate change presents a potential increase in suitable habitat and a northward expansion of coastal ecosystems, however, coastal erosion, permafrost melt, sea ice and glacial melt, ocean acidification and stratification, as well as increased run off all present rapidly evolving threats to the blue carbon of the Canadian Arctic Ocean. Human disturbances also present threats, including, increased shipping and sea traffic, resource exploration and extraction, and increased coastal development.
- The jurisdictions studied have not yet expressly integrated blue carbon sequestration concepts into their statutes and regulations. Plants are rarely identified as elements of "wildlife" and protections are primarily available by extension of their role as habitat for fish and other protected species.
- Blue carbon ecosystems have not yet become a central topic in policy among the studied jurisdictions. Where carbon sequestration is referenced, forests and occasionally peatlands and wetlands are identified. Marine environments do not tend to be featured.
- Jurisdictional boundaries complicate efforts to describe current legal frameworks and develop new approaches for the protection of blue carbon ecosystems. Some protected spaces however, in particular Migratory Bird Sanctuaries, acknowledge the importance of protecting habitat across the onshore-offshore divide. These spaces are "facts on the ground" that can be pointed to as precedent for future advocacy.

# INTRODUCTION

Among scientists and climate change problem-solvers, blue carbon has become widely recognized as a critical pillar in understanding and combating the global climate crisis. The sequestration and storage of atmospheric carbon in marine environments is now recognized as an important component of global carbon cycling. Aquatic ecosystems from the sediments through the water column, and in the Arctic, to the ice and snow perform these essential functions by pulling carbon from the atmosphere, in the form of carbon dioxide (CO<sub>2</sub>), to utilize and store. The efficacy of these processes depends on the health of marine, coastal, and freshwater ecosystems. Blue carbon sequestration impacts climate globally the protection of this service is of importance locally, nationally, and globally.

Beyond their contribution to reducing atmospheric CO<sub>2</sub>, blue carbon ecosystems play essential roles in promoting biodiversity; maintaining critical habitat for terrestrial, aquatic and amphibian species; improving water quality; and, supporting food security and wellness in coastal communities. These ecosystems also help mitigate against permafrost exposure, storm surge, flooding impacts, and erosion. However, these ecosystems are also vulnerable and coastlines around the globe have suffered significant losses of this natural carbon sink from a changing climate.

Among lawmakers and policy-setters in Canada, however, blue carbon sequestration remains an under-developed feature of our national, provincial and territorial climate change mitigation strategies. The excellent analyses prepared for WWF-Canada, by East Coast Environmental Law<sup>3</sup> and West Coast Environmental Law,<sup>4</sup> noted that while existing legislation and policy include tools that could be used to protect blue carbon resources, laws and policies specifically designed to protect these resources have yet to be developed. Without effective legal, policy and programming protections in place, these ecosystems remain vulnerable. This will not only limit the continued ability to store newly sequestered carbon but may also cause the release of previously stored carbon back into the atmosphere.

Looking northward, marine and freshwater ecosystems across Inuit Nunangat<sup>5</sup> and southern Hudson and James Bays represent a notable percentage of global blue carbon. Together, the Inuvialuit Settlement Region, Nunavut, Nunavik and Nunatsiavut comprise more than 40% of Canada's landmass and 72% of Canada's coastline.<sup>6</sup> The extensive coastline, knowledgeable Indigenous and other local communities, lower levels of industrial development and functioning regulatory and rights frameworks present a unique opportunity to advance blue carbon sequestration.

Like in Western and Eastern Canada, defining this blue carbon sequestration potential is anything but straightforward. In addition to the nascency of the concept in many circles and the transboundary nature of blue carbon ecosystems, the exploration of the tools applicable to Canada's Arctic requires inquiry into the intergovernmental, legislative and policy frameworks of 15 variously overlapping jurisdictions. These include the four Inuit regions of Inuit Nunangat recognized through the five Inuit-Crown treaties negotiated between 1975 and 2005: the *Inuvialuit Final Agreement*, the *Nunavut Agreement*, the *James Bay and Northern Quebec Agreement*, the *Nunavik Inuit Land Claims Agreement*, and the *Labrador Inuit Land Claims Agreement* along with Treaty 5 in

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3. ECELAW, *Atlantic Canada Blue Carbon Legislative & Policy Review* (2022). [ECELAW Discussion Paper]

4. WCELAW, *Policy and Planning for Coastal Ecosystems in British Columbia through a Blue Carbon Lens* (2020). [WCELAW Discussion Paper]

5. Inuit Nunangat means "Inuit Homeland" and includes the four Inuit regions: Inuvialuit Settlement Region (ISR) in northwestern Northwest Territories and Yukon, Nunavut, Nunavik in Northern Quebec and Nunatsiavut in Northern Newfoundland and Labrador.

6. These percentages were calculated by Inuit Tapiriit Kanatami in 2022 using CanVec Land Features dataset.

Northern Manitoba and Treaty 9 in Northern Ontario. Finally, these include the political jurisdictions of Canada, Yukon, Northwest Territories, Nunavut, Manitoba, Ontario, Quebec, Newfoundland and Labrador.<sup>7</sup> While the frameworks established under the Historic Treaties, Inuit-Crown treaties and those enacted and developed at the national, provincial and territorial levels are intertwined through laws of general application and paramountcy rules, it was determined that this *Framework for Blue Carbon in Canada's Arctic Coastal Ecosystems: Science, Treaties, Laws, Policies and Plans* would be approached in two phases in order to support accessibility and clarity for the reader.

The work is generally divided between the Phase 1 and Phase 2 Discussion Papers as follows:

**Discussion Paper Phase 1 – North of 60° Ecosystems; Federal, Territorial, Provincial Laws and Policies:** The present document draws on available literature and data to describe the characteristics of and conditions facing blue carbon ecosystems along Canada's northernmost coastlines. Current federal, provincial and territorial laws, regulations and policy measures in Yukon, Northwest Territories, Nunavut, Quebec, Manitoba and Ontario relevant to the integrity of blue carbon ecosystems are also outlined in the pages that follow.<sup>8</sup>

**Discussion Paper Phase 2 – Hudson and James Bay Ecosystems; Northern Treaties, Indigenous Rights and Environmental Management Frameworks:** The second phase of work will inquire into blue carbon ecosystems found in southern Hudson Bay and James Bay. Discussion Paper Phase 2 will also analyse the rights, governance and management structures under the five Inuit-Crown treaties that span the four Inuit regions of Inuit Nunangat<sup>9</sup> as well as Treaty 5 and Treaty 9 in Northern Manitoba and Northern Ontario respectively. Finally, it will analyse key conservation measures established and Impact and Benefit Agreements entered into pursuant to these treaties with a view to assessing their potential impact on blue carbon sequestration initiatives in the Arctic.

Though these topics are addressed sequentially, they are absolutely interdependent. Existing Indigenous and treaty rights are recognized, affirmed and protected under section 35 of the *Constitution Act, 1982*. The relationship between these constitutionally protected rights and federal, territorial and provincial (FPT) legislation is sometimes reflected in clauses such as the one at section 2(2) of the *United Nations Declaration on the Rights of Indigenous Peoples Act*: "This Act is to be construed as upholding the rights of Indigenous peoples recognized and affirmed by section 35 of the Constitution Act, 1982, and not as abrogating or derogating from them".<sup>10</sup> In other words, while FPT legislation may govern aspects of blue carbon ecosystems as described in this Phase 1, the general application of these laws may be limited in some cases by existing Indigenous and treaty rights. Accordingly, a comprehensive framework and set of recommendations for the support of blue carbon ecosystems in Canada's Arctic will only emerge when Phases 1 and 2 are read together.

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7. ECELAW has provided an analysis of the legislative and policy framework in Nunatsiavut and Newfoundland and Labrador. As such, Newfoundland and Labrador is not reviewed in Phase 1 of this paper. A discussion of the rights and regulatory regimes in place in Nunatsiavut may be included in Phase 2 for ease of reference.

8. Though portions of Newfoundland and Labrador territory lies in the Arctic, this jurisdiction was thoroughly assessed in the ECELAW paper. As such, it is not reviewed here.

9. Inuit Nunangat encompasses the four Inuit regions recognized in their respective modern treaties. These regions are the Inuvialuit Settlement Region, Nunavut, Nunavik and Nunatsiavut. These regions overlap with parts of Yukon, Northwest Territories, Quebec, Newfoundland and Labrador and all of Nunavut.

10. *United Nations Declaration on the Rights of Indigenous Peoples Act*, S.C. 2021, c. 14.

# PART 1: GEOGRAPHIC & JURISDICTIONAL SCOPE OF DISCUSSION PAPER

## GEOGRAPHY

The geographical parameters of this Discussion Paper follow the blue carbon ecosystems that occur along the southern Hudson Bay and James Bay coasts as well as those within the boundaries of the Inuit homeland, Inuit Nunangat, as this space is defined in the *Inuit Nunangat Policy*.<sup>11</sup> This is truly an enormous area, comprising more than 72% of Canada's coastline, more than 40% of Canada's landmass and including major marine areas, tidal zones, wetlands, land fast sea ice, inland waters and offshore areas.<sup>12</sup>

## JURISDICTIONS

The area of Inuit Nunangat (Figure 1) and southern Hudson Bay and James Bay include 15 Indigenous, federal, provincial and territorial jurisdictions.

From northwest to northeast, the Inuvialuit Settlement Region, Nunavut, Nunavik and Nunatsiavut comprise the four Inuit regions of Inuit Nunangat recognized through the five Inuit-Crown treaties negotiated between 1975 and 2005: the *Inuvialuit Final Agreement*, the *Nunavut Agreement*, the *James Bay and Northern Quebec Agreement*, the *Nunavik Inuit Land Claims Agreement* and the *Labrador Inuit Land Claims Agreement*. Along the southern Hudson Bay and James Bay coasts, Treaty 5, which was negotiated between the Crown and the Ojibwa peoples and Swampy Cree in 1875 spans northern Manitoba. Treaty 9, which was negotiated between Anishinaabe, Cree (including the Omushkegonguk) and Algonquin in 1905-1906 and 1929-1930 spans northern Ontario. These Numbered Treaties and Inuit-Crown treaties recognize and establish rights, regulatory structures and governing bodies that are unique to their respective region<sup>13</sup> and must be analyzed on a treaty-by-treaty basis (Figure 2). These treaties are constitutionally protected under section 35 of the *Constitution Act*, 1982.

Overlaying Inuit Nunangat and the regions of Treaty 5 and Treaty 9 are the jurisdictions of Canada, Yukon, Northwest Territories, Nunavut, Manitoba, Ontario, Quebec, Newfoundland and Labrador. A complicating factor in the jurisdictional analysis and in the design of a blue carbon sequestration framework is the marine-terrestrial divide between the federal government and the provinces and territories. This has been noted in the ECELAW and the WCELAW discussion papers and is an issue that persists in the Arctic reaches. Different in the present Discussion Paper is the presence of territorial jurisdictions. While the specific delegations are identified in the relevant sections below, it is worth noting here that unlike provinces that are assigned powers under section 92 and 93 of the *Constitution Act, 1867*, territories are subordinate to the federal government and exercise only those authorities that are specifically delegated to them through federal constituting legislation.

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12. *Ibid.*

13. Though structures and rights often have similarities across regions.

## THE REGION IN MAPS

The following maps illustrate the geography and political-legal jurisdictions discussed here.

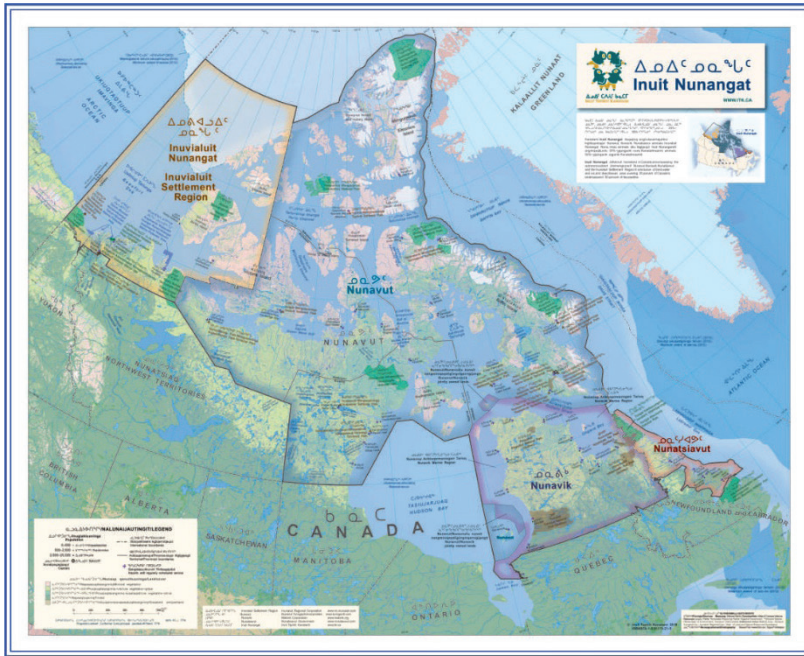


Figure 1. Map of Inuit Nunangat.<sup>14</sup>

Figure 2. Government of Canada, *Historic Treaties*.<sup>15</sup>

14. Inuit Tapiriit Kanatami, *Map of Inuit Nunangat* (accessed online: <https://www.itk.ca/wp-content/uploads/2019/04/ITK-Map-20190118-digital-rgb.pdf>, November 22, 2022).

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## CATALOGUE OF BLUE CARBON ECOSYSTEMS

### Kelp

Along the Eastern Canadian Arctic coast, kelp covers an estimated 312,000 km<sup>2</sup> of coastal zone with a carbon stock of 72.7 Tg C.<sup>16</sup> Emerging research indicates the presence of at least three kelp species along the coasts of the Kitikmeot Region<sup>17</sup>, previously documented by Indigenous communities<sup>18</sup>, although no biomass or carbon stock estimates have been made. Large data gaps exist elsewhere along the Arctic coasts, especially in the high Canadian Arctic, historically labeled as a scarce environment, with minimal rocky substrate and therefore kelp, however emerging research now suggests otherwise. More research is needed in this under-studied, icy region to determine panArctic kelp distribution and subsequent contribution to blue carbon.

### Salt marsh

Statistics Canada indicates there is currently 3,602 km<sup>2</sup> of mapped salt marsh in Canada, with 63% of Canada's mapped salt marsh residing on the Arctic coast.<sup>19</sup> Salt marshes have been documented as far north, within the Canadian Arctic, as Ellesmere Island, however, they thrive in more temperate waters. There is a large distribution of salt marsh within the Mackenzie delta and even more so along the southern coast of the Hudson Bay.<sup>20</sup> Again, large data gaps exist regarding the extent and biomass of salt marsh along the Canadian Arctic coast, carbon sequestration rates, and carbon stocks of Canadian Arctic salt marshes, of which more research is needed in order to appropriately address management needs.

### Eelgrass

Within the Canadian Arctic and subarctic, eelgrass meadows flourish within the Hudson Bay and James Bay, and are suspected to be largest marine meadows along the North American coasts.<sup>21 22</sup> Along the high and western Canadian Arctic coasts gaps within seagrass distribution and biomass exist, however, Indigenous communities have observed eelgrass near settlements in the Northwest Territories and Nunavut, with the most northern observation at Grise Fiord in Nunavut in the Eastern Arctic.<sup>15 23</sup> While there are studies regarding the estimated carbon sequestration rates of eelgrass meadows along Canada's Pacific and Atlantic coasts, as well as along other Arctic coasts such as in Greenland and Norway, no estimates for rates of carbon sequestration or carbon stocks within eelgrass along the Canadian Arctic coast currently exist. To effectively manage these ecosystems more research is needed to determine the approximate biomass and subsequent carbon sequestration and storage by these ecosystems.

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## Phytoplankton

Phytoplankton dominate the Arctic waters, representing a foundational pillar in the Arctic food web and high rates of primary production. Massive carbon uptake occurs in the blooms of phytoplankton that can be seen from space, in the past, only occurred in the spring, but have now begun to also occur in autumn. The loss of sea ice has presented new opportunities for phytoplankton blooms as it has increased sun exposure, as well as phytoplankton habitat size and length of growing season, beginning earlier, and ending later.<sup>24</sup> This subsequently increases annual net primary production and therefore carbon uptake. Emerging data indicates, with increased irradiance of the seafloor caused by sea ice loss, areas along the Canadian Arctic coast may experience new occurrences of specifically sea floor blooms in the future, such as the Canadian Arctic Archipelago and Foxe Basin.<sup>25</sup> Making confident hypotheses regarding the consequences of intensifying climate change remains difficult. Large data gaps exist regarding the extent of, and biomass produced by phytoplankton blooms, as well as the occurring carbon fixation rates and alterations climate change may induce.

## Ice Algae

Ice algae blooms support the Arctic food web as well as contribute to primary production and carbon uptake, although to a lesser extent than phytoplankton. These blooms commence within and underneath sea ice in the early spring and result in either the burial or recycling of its organic carbon.<sup>18 26 27</sup> Although data gaps exist regarding the produced biomass of ice algae blooms within the Canadian Arctic, as ice algae is often underrepresented when discussing Arctic primary production, some of the highest levels of ice algae biomass has been recorded within Canadian landfast ice, namely in Resolute Bay.<sup>28 29</sup> Similar to phytoplankton, climate change presents new opportunities and threats. As sea ice continues to thin and melt ponds increase, significant increases in ice algae north of 77°N are expected while the outcome of ice algae south of 77°N is more uncertain. North of 77°N this is due to the thinning of thick, multiyear ice and increase in melt ponds, increasing light availability to the algae. Whereas south of 77°N as seasonally formed sea ice melts earlier, the algae may experience habitat loss and a shortened window of production.<sup>30 31 32</sup> Large data gaps exist regarding the rates in which sea ice algae uptake carbon and the fate of said carbon, whether it be recycled within the water column or buried in floor sediments. Further research clarifying the extent, as well as ice algae's role and contribution in blue carbon uptake and storage within the Canadian Arctic is needed to better manage and address potential climate impacts.

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# PART 2: BACKGROUND ON BLUE CARBON COASTAL ECOSYSTEMS IN THE ARCTIC

## OVERVIEW

The shallow Arctic Ocean and its coastal areas play a critical role in the global climate system and is generally considered to be a sink for atmospheric CO<sub>2</sub>, largely due to its blue carbon ecosystems.<sup>33</sup> The unique aspects of seasonal and permanent ice cover complicates the clean delineation of the coastal areas and marine areas as for most areas the ice over extends from the coast and for Inuit is seen as a contiguous environment of which they are central to.

The Arctic Ocean absorbs, stores, and circulates CO<sub>2</sub> through numerous physical processes including the solubility pump and ocean currents. Air-sea CO<sub>2</sub> flux measurements suggest that the Arctic Ocean, with a surface area of only 3 percent of the global ocean, is responsible for roughly 5 to 14 percent of present day global oceanic carbon uptake.<sup>34</sup> There are several factors unique to the Arctic Ocean that heavily influence carbon sequestration and storage. This relatively large carbon uptake is driven by numerous interacting variables, including the organisms and their ecosystems both those considered and not traditionally considered blue carbon ecosystems. Other factors include ice coverage, sea shelf processes, sediment dynamics, water temperatures, ocean depth, and altered ocean dynamics that threaten blue carbon sequestration.<sup>35</sup>

Inuit Nunangat is a fundamentally maritime region and as noted earlier hosts 72% of Canada's coastline, more than 40% of Canada's landmass and including major marine areas, tidal zones, wetlands, land fast sea ice, inland waters and offshore areas.<sup>36</sup> While there is evidence of blue carbon ecosystems populating these coasts, more field research is required to quantify the potential of these ecosystems to sequester carbon. The Arctic Ocean, like other oceans, stores carbon within its sediments, flora and fauna, including blue carbon ecosystems, within the water column and even in the ice layers. Carbon mapping has proven especially difficult in the Arctic Ocean, due to its remoteness, extreme weather conditions, barriers to the use of remote sensing products (e.g., multi year ice), and the equipment needed for in-field measurement, of which is both costly and difficult to transport in such harsh conditions. With the exception of kelp research done in the eastern Arctic, little mapping of blue carbon ecosystems such as seagrass, salt marsh, and kelp forests have been completed. Likewise, the CEC North American blue carbon mapping initiative encompasses few data points for seagrass and saltmarsh ecosystems in the Canadian Arctic.<sup>37</sup> Importantly, the full distribution and scale of blue carbon ecosystems in the Arctic will require further mapping effort led by, and in collaboration with coastal communities.

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## ARCTIC BIOTA

Of the carbon sequestered by biological sources, over half is captured by living marine organisms, highlighting the importance of blue carbon and the need for conservation.<sup>38</sup> The Arctic supports > 21,000 species of mammals, birds, fish, invertebrates, plants and fungi, plus an estimated several thousand species of endoparasites and microorganisms, many of which have yet to be described. In the marine realm, biodiversity tends to be high in the vicinity of the Arctic gateways from the North Atlantic and North Pacific Oceans.<sup>39</sup> The functional significance of different groups of organisms in maintaining the integrity, structure, services, and health of Arctic ecosystems, however, is generally greatest among those we understand least. Microorganisms are key elements of Arctic ecosystems, yet they have been little studied.<sup>34</sup> Within the Arctic Ocean, previous studies have identified 4 main contributors to marine primary production and carbon sequestration, including phytoplankton, ice algae, macroalgae, including kelp and salt marshes, and seagrass (eelgrass). Although phytoplankton and some algae ecosystems are not currently considered blue carbon ecosystems, they are gaining recognition as large contributors to blue carbon. Lovelock and Duarte (2019) detail the potential reasoning for the lack of classification as blue carbon ecosystems, due to a combination of gaps in scientific understanding of carbon stocks or greenhouse gas fluxes, limited potential for management, and limited accounting for ecosystem extant and carbon sequestration.<sup>40</sup>

## PLANKTON – FIRST STAGE IN MARINE LIFE

The term plankton is used to describe a group of organisms that live in water and are carried along by ocean currents without the means to swim against the current. Plankton can be flora (phytoplankton, made up of unicellular algae) or fauna (zooplankton: eggs, larvae, small animals, gelatinous creatures, etc.). In the Arctic Ocean the algae component of plankton grows in the surface water, down to a depth of a few dozen metres, where the sunlight is still strong enough to allow photosynthesis to take place. Like land-based plants, phytoplankton needs both mineral elements and sunlight to be able to grow. There are thousands of different species of planktonic algae, all of them microscopic.<sup>18</sup>

The spring to early summer phytoplankton bloom is often considered as the single most important event in the seasonal cycle of production in the Arctic, followed closely by the bloom of ice algae. Previously, Arctic phytoplankton blooms were believed to only occur at the sea ice edge. This theory was proven false after under-ice blooms were observed in the Chukchi Sea (2011) reaching concentrations of organic carbon among the highest ever recorded in phytoplankton blooms.<sup>41, 42</sup> It was hypothesised this was a result of large melt ponds residing on top of the ice, transmitting sufficient light to sustain primary production underneath the sea ice.<sup>43, 44</sup> The phytoplankton blooms that occur under the Arctic Ocean ice have been documented reaching magnitudes

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similar to or even greater than blooms observed in the open ocean with carbon fixation rates exceeding  $30 \text{ g C m}^{-2} \text{ d}^{-1}$ .<sup>45, 46</sup> Phytoplankton blooms also occur along the coastal benthic regions and seafloor in areas of high irradiance on the seafloor. Such areas in the Canadian Arctic, including the Canadian Arctic Archipelago and Foxe Basin, may potentially experience unobserved bottom-associated blooms and therefore have vastly under-representative biomass and blue carbon capture estimates.<sup>47, 48</sup>

Phytoplankton blooms not only sequester large amounts of carbon, but they are also essential in the Arctic food web, feeding krill which are then ingested by seabirds, seals, whales, and many other Arctic Ocean animals and other marine mammals, fish and birds that share the Arctic for part of their life cycles. This feature alone makes the Arctic a globally important ecosystem for many species.

The transfer of primary production from the short-lived phytoplankton bloom to upper trophic levels depends not only on the temporal and spatial coupling between grazers and the timing of bloom occurrence, but also on the taxonomic composition of the bloom. In the warming Arctic, earlier sea-ice retreat and later freeze-up are changing the phenology of the phytoplankton bloom. Predictions for a second fall bloom due to longer open-water seasons are now documented throughout the Arctic and on Canadian shelves.<sup>49, 50, 51</sup>

Marine phytoplankton significantly contributes to the primary production occurring within not only the Arctic Ocean but the global ocean, accounting for roughly 50% of all photosynthesis on Earth. This contribution to the global primary production results in the fixing of roughly 50 Gt carbon annually.<sup>52</sup> During photosynthesis the phytoplankton lower the CO<sub>2</sub> partial pressure of the upper ocean. Because of this change, increasing the gradient of CO<sub>2</sub> from the atmosphere to the upper ocean, more CO<sub>2</sub> is able to diffuse into the surface waters.<sup>53</sup> A by-product of this photosynthesis is the formation of particulate organic carbon. This carbon is processed by other organisms such as zooplankton and then is exported to the deep ocean.<sup>54</sup> Zooplankton are consumed by numerous arctic marine species, including arctic cod, capelin, and young herring. Arctic cod, though small, are found in great numbers in dense schools and are a key food item for marine mammals, seabirds, and other fish.

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The loss of sea-ice and ocean acidification are presenting new challenges and opportunities for phytoplankton. The reduction in sea-ice within the Arctic Ocean has facilitated longer growing seasons and created more accessible habitat for phytoplankton.<sup>55, 56</sup> Net primary production within the open Arctic Ocean increased 30% from 1998 to 2012 after sea-ice extents reached, for the time, record minimums.<sup>57</sup> The largest increases in primary production being that of the Arctic Oceans interior shelves, including the Beaufort shelf off the coast of the Inuvialuit settlement region and Alaska, with an increase of 10-112% within the same time period, whereas the exterior shelves, such as the Baffin and eastern Greenland shelves, experienced respective changes of +8% and -15% respectively.<sup>52</sup> Longer periods of seasonally open waters has also resulted in blooms, that once only occurred in the spring, to also occur in autumn.<sup>45</sup>

Although sea-ice reduction presents growth opportunities for phytoplankton, it also presents potentially harmful consequences. Changing ocean dynamics, including ocean stratification causing nutrient limitations, have altered phytoplankton and algae cell structure and size, favouring smaller sizes. This potentially affects the uptake of carbon during production and the subsequent exportation of carbon, as well as food web connections depended upon by other organisms within the Arctic ecosystem such as high-Arctic top predators.<sup>58, 45</sup> Earlier breakup of ice can cause the phytoplankton blooms to occur prematurely, altering the subsequent export of carbon down the water column of which is relied upon by numerous pillars of the Arctic food web such as zooplankton.<sup>59, 23</sup> Further research with an emphasis on the long-term consequences of such ecological changes are needed for the proper monitoring and management of these sea-ice habitats. Data showing an increase of almost half over the past decade in Arctic phytoplankton primary production, suggests the Arctic is becoming more productive and could export more carbon in the future.<sup>60</sup>

## ALGAE

There are an estimated 4,000 algal species reported to exist within the circumpolar Arctic, including both freshwater and marine habitats. Marine phytoplankton and macroalgae are a huge contributor to the Arctic marine food web, providing sustenance for numerous species both directly and indirectly. Directly as a food source to species such as sea urchins and indirectly as detrital material, distributing organic material to regions a great distance or depth from growth sites.<sup>61 62 63</sup>

In the Arctic Ocean, previous estimates of algae contribution to the total carbon sequestered to be roughly 57% of the primary production occurring within the central Arctic Ocean and up to 25% that takes place on

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Arctic shelves.<sup>64</sup> However, there are scarce estimates of their contribution in recent studies. Rates of carbon sequestration by algae can be affected by numerous factors, including, the distance the algae bloom is from the estuary, water quality including its salinity, pH, and temperature, meadow configuration (e.g., canopy height and shoot density), location in the meadow (i.e., inside vs. edge), nitrogen levels, sediment composition, and light availability.<sup>65</sup>

These vegetated ecosystems contribute not only to primary production but provide many essential ecosystem services, such as providing habitats for other organisms, protection of coastal communities and coastal erosion, and contributes to food security of all those within the Arctic.<sup>66</sup>

## ICE ALGAE

Ice algae live within and on the underside of sea ice and are primarily composed of diatoms. Numerous ice algae species reside within the Arctic, the most prominent being the diatom species *Nitzschia frigida* Grunow.<sup>24, 67, 68</sup> Similarly to phytoplankton, ice algal blooms contribute to both Arctic Ocean carbon fixation as well as the food web. Sea ice algal blooms commence within and underneath sea ice in the early spring, phytoplankton blooms in the water column normally occur has reached an advanced state of melt and disintegration in the later half of summer.<sup>20, 37</sup> In seasonally ice covered regions ice algae can contribute up to 40 percent of the total primary production.<sup>69, 70</sup> Arctic blooms vary greatly in both extent throughout the Arctic and in duration, lasting between 30-50 days in land fast ice.<sup>23, 40</sup> Although, no duration estimates currently exist for blooms within drifting pack ice as no studies have followed full growth cycles. Variance also exists regarding the primary production of blooms. Ice algae blooms within the Canadian Arctic have proven to be the most productive in the world. Specifically, ice algae biomass within land fast ice in Resolute Bay were of the highest ever recorded values of ~300 mg Chl a m<sup>-2</sup>.<sup>23</sup> This suggests the extent, biomass, and therefore blue carbon uptake and potential burial of ice algae within the Canadian Arctic is likely extremely underestimated.

Researchers, such as Hill et al. (2022) believe the variance among ice algae blooms, in primary production and therefore biomass and carbon uptake, is due to differences in the thickness of snow residing on top of sea ice, as well as the difference in ice thickness.<sup>24</sup>

Upon the blooms detachment from the sea ice and the large mass of organic carbon begins sinking through the water column, a portion of it is recycled by microbes, while the rest sinks to the sea floor. The majority of matter is then either recycled by seafloor microbes while the rest is stored in sediment. This microbial loop is responsible for a large portion of the blue carbon held within the Arctic Ocean and its carbon cycle, while also supporting Arctic Ocean copepod and euphausiid shrimps, both known to have extremely large species biomass and therefore a large contribution to carbon storage and turnover, however it is unclear how much of this carbon is ultimately buried.<sup>71</sup>

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Previous estimates of ice algal biomass and production in the coastal ice-covered Arctic Ocean often only include phytoplankton, neglecting the contributions of sea-ice algae.<sup>22,59, 72</sup> Whereas, some studies have utilised indirect measuring approaches to attempt to include ice algae, such as measuring nitrate drawdown in surface waters over the entire ice algal bloom period. A study by Matrai and Apollonio has previously indicated much higher primary production within ice algal blooms than previously assumed.<sup>23, 73</sup> However, this contribution may be at risk, as while sea ice diminishes so does the habitat of ice algae.<sup>64</sup> As sea ice continues to diminish, ice algae is driven from the coastal shores as their habitat becomes more limited to the deep basins of the Central Arctic Ocean.<sup>74</sup> The changing climate, causing an earlier seasonal melting of sea ice and later formation, results in a shift in when ice algae blooms occur. This change further impacts the primary and secondary producers that depend upon the bloom as an essential food source, potentially altering the degree of carbon sequestered and transferred up the food chain.<sup>20, 75</sup> There is a critical need year-round in situ sampling, especially to get a better understanding of the incorporation of sea ice algae into the sea ice during its formation and possible early brine drainage at the end of winter, and the impact of these physical processes on ice algal development. With the ongoing warming climate in the Arctic, the general trend toward thinner sea ice, longer open-water periods and less snowfall would drastically increase the availability of light and affect microalgal growth beneath the ice cover potentially in areas such as in the Baffin Bay.<sup>24</sup> It is expected that an earlier onset of ice melt may shorten the sea ice algal growth season yet increase the potential for under-ice phytoplankton blooms in these regions.

Another climate related risk to ice algae is the rising ocean acidification which causes stratification of surface water and limits the nutrient supply to the algal bloom. This leads to premature termination of the algal blooms. This shorter production period diminishes the total primary production and export of ice algal biomass and their contribution to the arctic food web.<sup>20, 23, 70</sup>

The large data gaps regarding the extent, biomass, carbon capture rates, and carbon burial rates of Canadian Arctic ice algae make creating future predictions of the organism's health and blue carbon contribution difficult. However, utilizing climate forecasts of increased light availability due to decreased thickness in ice and snow cover, models indicate ice algae should respond by shifting phenology, increasing overall primary production, and extending their habitat northward to include the larger extent of seasonal ice.<sup>25, 39, 76</sup> Although it is expected the entire Arctic will not experience the same increase in potential carbon capture.

Ice algae north of 77°N is expected to see such an increase in primary production and subsequent carbon capture, due to increased light availability as the thick, multi year ice thins or becomes seasonally forming and snow cover thins. However, the future of ice algae south of 77°N is much more unpredictable as benefits to primary production from increases in light availability are coupled with potential loss of habitat entirely. This is due to faster melting of seasonally formed ice, limiting habitat and shortening of their growth period, prematurely detaching from fast melting ice.<sup>24, 25, 71</sup>

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## MACROALGAE

There are roughly 200-215 species of macroalgae in the Arctic, however their distribution within the Arctic is poorly mapped. Macroalgae comprise the most extensive and productive vegetated seafloor marine habitats; widely distributed across coastal latitudes including kelp forests in cold, coastal waters.<sup>77, 78</sup> The most abundant Arctic macroalgae include kelp, moss, and salt marshes. Although less than 12 of the 210 macroalgal species Archambault et al. (2010) documented grow within the Canadian Arctic, these kelps often have the largest total biomass of any macroalgae due to their size.<sup>79, 80, 81</sup>

With such extensive primary production, algae are considered highly important in the sequestration and storage of blue carbon. Although algae comprise less than 0.2% of the ocean, they are responsible for a significant amount of the primary productivity of the global ocean (1%) and are responsible for approximately 15% of the carbon sequestered by the oceans.<sup>82</sup> This disproportionate contribution results from their ability to filter particulate carbon from the water column and utilise it in primary production.<sup>73</sup> Despite algae's host of ecosystem services, minimal comprehensive mapping of the Arctic has been done. Mapping is done utilising numerous tools, including underwater videography, aerial imagery, satellite, benthic sonar, LiDAR, and remotely piloted aircraft systems (RPAS).<sup>83, 84, 85</sup>

Macroalgae's growth is limited by a number of factors, including the Arctic's extreme variability in climate and weather events.<sup>75</sup> Many of the algae species found in the Arctic have developed adaptations in order to facilitate photosynthesis and tolerate their environment, however environmental factors can greatly impact the ability of algae to flourish most effectively. These environmental factors include long periods with limited sunlight facilitating photosynthesis, physical scouring of the seafloor, and cold temperatures.<sup>86, 87</sup> Regardless of these constraints, macroalgae biomass has been increasing in the Arctic.<sup>76</sup> Despite this, the Canadian Arctic was found to have large gaps in the mapping of macroalgae.<sup>88</sup>

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## KELP

Kelp species are some of the most abundant macroalgae species in the Arctic Ocean, facilitated by their ability to thrive in the cold waters and their large biomass.<sup>75</sup> The kelp species that inhabit the Arctic coasts include *Saccharina latissima*, *Laminaria solidungula*, *Alaria esculenta*, *Hedophyllum nigripes*, and *Agarum clathratum*, growing to depths of 30-40 m.<sup>72,89</sup> Kelp forests provide a host of ecosystem services including, providing fish and other fauna habitat and nursery grounds, providing sustenance for pelagic and benthic organisms, support Arctic food webs, protect coasts and coastal communities from erosion, and play large roles in the sequestration of blue carbon.<sup>72, 90, 10</sup> Kelp forests in the Arctic export carbon via three principle methods; direct export of kelp matter to the deep sea water column and eventually sediments, kelp biomass being consumed by another organism, and, if surrounded by soft sediments, direct export to shallow self sediments.<sup>72</sup>

Hard substrate dominate the benthic zones of a large portion of the Canadian Arctic coast, allowing the wide distribution of kelp along the Canadian coast from the coast of the Inuvialuit region in the Beaufort sea across to the eastern Baffin Bay off the coast of Nunatsiavut, although the majority reside in eastern Arctic waters.<sup>66</sup> Current western scientific observations have reported kelp species, in the Canadian Arctic, between Ellesmere Island and Labrador, and along coasts in Lancaster Sound, Ungava Bay, Hudson Bay, Baffin Bay, and Resolute Bay.<sup>11</sup> Along these Canadian Arctic coasts kelp was found to flourish, exhibiting high levels of productivity and biomass. Observed kelp beds such as in Frobisher Bay reached heights of 15-m tall while beds in Ungava Bay reached large biomass levels of 19 kg wet weight m<sup>-2</sup>.<sup>91</sup> This is extremely important to Canadian blue carbon. As the extent of these ecosystems becomes more researched, their perceived contribution to blue carbon grows.

Kelp also inhabits sub-arctic waters including the western and eastern shores of Hudson Bay, as far south as the Belcher Islands and community of Sanikiluaq and adjacent waters which are included in Inuit Nunangat.<sup>11</sup> Despite this large distribution along the Arctic and sub-arctic Canadian coastline, large gaps exist across the entirety of the Canadian Arctic Ocean coast in kelp distributions, biomass, carbon uptake, and the potential drivers that may affect such kelp forests.<sup>83</sup> This research gap is especially apparent in the high Arctic, where extremely minimal research has been done as it was previously believed to not provide suitable habitat for kelp, due to minimal rocky substrate and light availability. However, scattered rocky coasts in the Canadian high Arctic have temperatures and light conditions that should support kelp.<sup>57</sup> These forests may, however, experience harsh conditions such as extensive sea ice scour, long periods of darkness, variable salinity, turbidity, and/or low temperatures.<sup>92</sup>

Recent studies in the Eastern Canadian Arctic and Subarctic by Goldsmit et al., (2021) have attempted to partially fill the large knowledge gap surrounding kelp, as well as projections for their future, along the Canadian Arctic coastline. They found current estimates of kelp distribution and contribution to carbon uptake in the Arctic Ocean to be vastly underestimated. The majority of the coastal regions of the Eastern Canadian Arctic were found to currently provide suitable habitat for kelp. Therefore, the potential extent of kelp along the Eastern Canadian Arctic coast is much greater than previously thought, with a potential suitable habitat of over 312,000 km<sup>2</sup> in the Eastern Canadian Arctic alone.<sup>10</sup> The data gathered in this area alone may increase estimates for subtidal macroalgae in the entire Arctic, as well as the estimated global distribution of kelp forests, as the values underestimate the extent of suitable habitat in the Arctic (Jayathilake and Costello, 2020).<sup>72, 93, 94</sup> Understanding

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the extent of kelp in the Arctic is extremely important in evaluating its contribution to blue carbon. The total standing stock of carbon within kelp forests of the Eastern Canadian Arctic is 72.7 Tg C, accounting for over four times more than the standing stock of carbon within the kelp in all of Australia (16.6 Tg C) and ten times the standing stock of carbon within the kelp in Norway (7.1 Tg C).<sup>88, 95</sup> This area provides such suitable habitat due to its lengthy coastline as a result of the many islands, fjords, and bays and the wide shallow coastal shelves that fall within the depth limits of macroalgae.<sup>10</sup>

It is extremely important to note, although this gap in both research and knowledge exists within western science, this knowledge may, and often is, present among local Indigenous communities, as they are and have been the stewards and observers of these lands and waters since time immemorial. For example, emerging research has indicated the presence of kelp within the Kitikmeot Region, a portion of the northern Nunavut coast.<sup>11</sup> Although local communities have long since observed kelp within this region describing edible and hollow stemmed kelp species along the coasts of Cambridge Bay, the Finlayson Islands, and the northern side of the Kent Peninsula.<sup>12</sup> The importance of co production of knowledge and research, among Indigenous and western knowledge holders, can not be emphasised enough. The inclusion and representation of Indigenous Peoples, leadership, knowledge, priorities, and ways of life is absolutely vital in every step of research planning and execution, decision making, and policy making and execution. This allows not only the most comprehensive and accurate knowledge to be produced but also ensures long term sustainable and effective, Indigenous led, stewardship of the lands, waters, and ecosystems.

This knowledge is extremely vital as the shallow and narrow Northwest Passage in particular is experiencing increasing rates of human presence in the form of vessel traffic and this may present threats to numerous ecosystems, of which there is no baseline data.<sup>96</sup> This also applies to the high Arctic. The loss of sea ice is increasing accessibility, and potential harm, to the once frozen over Arctic waters and coasts. More comprehensive research is needed as climate change and human disturbance presents new threats to unknown ecosystems of extreme importance.

Kelp forests are threatened by both climate change and human impacts, causing recent documented decline in global kelp stock in coastal areas.<sup>73, 97</sup> The IPCC previously ranked kelp forests among the most vulnerable ecosystems to the threats of climate change.<sup>98</sup> Marine heatwaves, of which are increasing in both frequency and intensity due to climate change, are particularly harmful to kelp.<sup>84, 99</sup> Kelp in North America have experienced documented declines after such marine heatwaves.<sup>88, 100</sup> Climate change presents other threats to Arctic kelp stocks, such as, coastal erosion from melting sea ice, seabed disturbance from ice scouring, permafrost melting, and high glacial inputs are altering ocean and carbon dynamics along the Canadian Arctic coasts.<sup>83, 101</sup> Physical disturbance of coastal regions from erosion, permafrost and shelf collapse, and ice scouring disturb the carbon stored in coastal sediments, increase turbidity limiting light availability, and harm the ecosystems present,

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including kelp. Ocean freshening and reduced salinity caused by sea ice and glacial melt presents harmful impacts on kelp including nutrient limitation.<sup>102, 103</sup> An area where this influence on kelp becomes of particular importance in the Canadian Arctic is within the Hudson Bay region, of which will be further discussed in the following part of this project.

However, climate change presents unique opportunities and threats to kelp forests in the Arctic. Climate change induced warming of the Arctic, loss of sea ice, and reduced snow cover may present an increased suitable habitat. Loss of sea ice as well as decreased depth of snow cover over the sea ice results in an increase in light availability, supporting photosynthesis in regions previously unsuitable.<sup>76</sup>

Long term research of kelp in the Arctic has been performed in areas such as the Aleutian Islands and the Beaufort Sea's 'Boulder Patch' in Alaska, with records of kelp abundance from the 1970s to the mid 2010s.<sup>104</sup> However, there are minimal long-term studies on the extent of kelp in the Canadian Arctic and the resulting changes caused by climate change. The lack of baseline data makes creating future predictions on the change of kelp biomass difficult. However, Goldsmit et al., (2021), predicts this increase in suitable habitat may cause a northward expansion for all kelp species along the Eastern Canadian Arctic coast, except for *L. solidungula*, as it is less suited for warming waters.<sup>10</sup> Similarly to Goldsmit et al. (2021), research from other Arctic States such as Greenland, Russia, and Norway suggest increased temperatures and decreased sea ice may support increased kelp productivity and biomass in the Arctic, expanding both habitat and depth limits.<sup>76, 83</sup> Although, the positive effects felt by the increase in suitable habitat will be regional, dependant on the degree of detrimental influences including glacial and sea ice melt, permafrost collapse, turbidity increase, and freshening in coastal areas.<sup>98, 105, 106</sup>

## SALT MARSHES

Salt marshes are an important blue carbon ecosystem, able to accumulate carbon at rates similar to mangrove ecosystems and at higher rates relative to seagrass and terrestrial ecosystems.<sup>107</sup> Salt marshes also provide many other ecosystem services including protection from coastal erosion to other ecosystems and coastal communities, provide habitat and nursery habitat for fish and other organisms, and have a crucial role in nutrient cycling.

Previously Arctic salt marshes were thought to be relatively uncommon, growing along roughly 5% of the Arctic Ocean coastline. In 2022, data released in conjunction with Statistics Canada's Census of Environment program, indicated an additional 1,304 km of Canadian coastline being classified as salt marsh.<sup>13</sup> However, some ambiguity remains in the report, as there is currently no estimated area of the additional salt marsh habitat, and it was not indicated the percentage of new habitat is located along the Arctic coast. Statistics Canada indicates there is currently 3,602 km<sup>2</sup> of mapped salt marsh in Canada, with 63% of Canada's mapped salt marsh was on the Arctic coast, mainly on Hudson's Bay; 17% was on the Pacific coast, and 21% was on the Atlantic coast.<sup>13</sup> In 2021, of the presently documented salt marsh, 38% along the Arctic coast was conserved, compared with 33% on the Pacific coast, and 23% on the Atlantic coast.<sup>13</sup> These "conserved" salt marsh ecosystems, although

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conserved from direct threats such as human disturbance, are vulnerable to indirect threats and are influenced by all changes both marine and terrestrial.

Along the Arctic Ocean coast, salt marshes often grow in flat areas, within the intertidal zone of estuaries. Growth follows closely to the tidal river channels, tidal lagoons, estuaries and across inundated tundra. Although salt marshes have been documented as far north, within the Canadian Arctic, as Ellesmere Island, they thrive in more temperate waters, such as the Mackenzie delta and along southern Hudson Bay.<sup>14</sup> Despite the importance of salt marshes, large data gaps remain related to salt marsh distribution and carbon dynamics, especially in the Canadian Arctic.<sup>108</sup> Salt marshes have been well documented along other Arctic coasts. Between Alaska and Russia, along the Bering Sea coast salt marshes are well documented, forming within a variety of conditions, for example, small blue carbon ecosystems along the Aleutian coast, extensive lagoonal networks behind barrier beaches, and large inland systems within the Yukon-Kuskokwim Delta.<sup>109</sup>

Salt marsh's ability to act as a blue carbon ecosystem and sequester carbon is threatened by climate change, human activities, and other interacting variables.<sup>110, 111</sup> Factors present along the Arctic coast such as permafrost melt; mass ice and snow melt; coastal erosion; sediment disturbance due to ice scouring, extreme storms, and human activity such as shipping or fishing; invasive species; land use changes and coastal development; temperature increases; nutrient limitation resulting from ocean stratification and freshening; and accelerated sea-level rise and subsidence all hinder carbon uptake and exacerbate potential release of stored carbon by salt marshes.<sup>102, 106, 112, 113</sup>

Despite their carbon sequestration abilities, salt marshes can also release GHGs, such as CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O as a result of the remineralization of organic matter. The degree of GHG release is influenced by numerous factors, including water temperature, tidal inundation, salinity, biomass, nutrient availability, and sediment disturbance.<sup>114, 115, 116, 117</sup> Along the Canadian Arctic coast increasing water temperature, decreasing salinity, nutrient limitation, as well as sediment and ecosystem disturbance, may have detrimental effects to Arctic salt marshes, potentially resulting in increased GHG emissions. Data concerning the magnitude and effects resulting from this release of GHGs was found for the only east coast of Canada and indicated the degree of emission is small relative to their carbon uptake.<sup>104</sup> Large data gaps concerning Canadian Arctic salt marshes and their GHG emission exist. Due to the importance of salt marshes along the Canadian Arctic coast and the potential impact

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116. Moseman-Valtierra, S. M., Szura, K., Eagle, M., Thornber, C. S., & Wang, F. (2022). CO<sub>2</sub> uptake offsets other greenhouse gas emissions from salt marshes with chronic nitrogen loading. *Wetlands*, 42(7), 1-15.

117. Agosto, L. E., Qin, G., Thibodeau, B., Tang, J., Zhang, J., Zhou, J., ... & Cannicci, S. (2022). Fiddling with the blue carbon: Fiddler crab burrows enhance CO<sub>2</sub> and CH<sub>4</sub> efflux in saltmarsh. *Ecological Indicators*, 144, 109538.

changing factors may have on their carbon uptake and GHG emissions, it is vital more comprehensive research regarding salt marshes along the Canadian Arctic coast is conducted.

Global estimates indicate the loss or degradation of roughly 50 percent of worldwide salt marshes due to increasing human activities since the 20th century.<sup>118</sup> The extent of salt marsh loss in Canada is estimated to be high but is unfortunately unknown, however, due to the lack of both long term and current studies on salt marsh distribution and health along Canada's coasts.

### SEAGRASS/ EELGRASS

Seagrasses are an important blue carbon ecosystem that have been documented along all three Canadian coasts. Seagrass ecosystems not only sequester carbon, but serve a multitude of ecosystem services, including coastal erosion protection, habitat and nursery creation, sediment stabilisation, and improving water quality.<sup>119</sup> Within the Canadian Arctic and subarctic, eelgrass meadows flourish within the Hudson Bay and James Bay, and are suspected to be largest marine meadows along the North American coasts<sup>15, 16</sup>, of which will be discussed in the subsequent part of this project. Along the high Arctic coast gaps within seagrass distribution exist, however, eelgrass has been observed near settlements in the Northwest Territories and Nunavut, with the most northern observation at Grise Fiord in Nunavut in the Eastern Arctic.<sup>10, 17</sup> The distribution of eelgrass within Canada, as described and documented by Murphy et al. (2021), can be seen in Figure 3.<sup>15</sup>

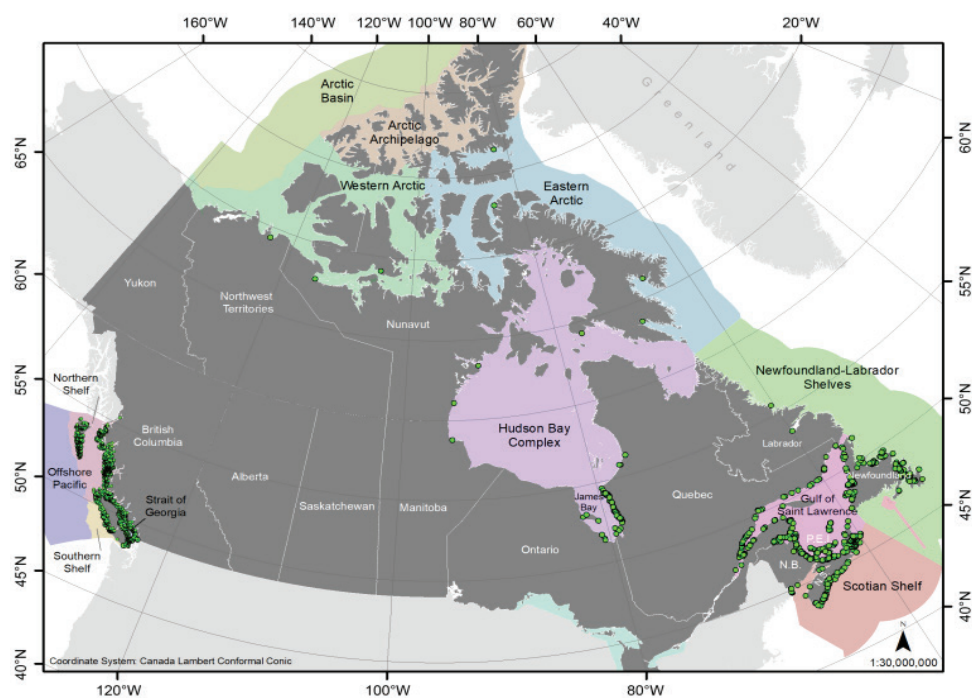


Figure 3. Distribution of eelgrass (*Zostera marina*) in Canada across 12 marine bioregions.<sup>120</sup>

118. Barbier, E. B., Hacker, S. D., Kennedy, C., Koch, E. W., Stier, A. C., & Silliman, B. R. (2011). The value of estuarine and coastal ecosystem services. *Ecological monographs*, 81(2), 169-193.

119. Mtwana Nordlund, L., Koch, E. W., Barbier, E. B., & Creed, J. C. (2016). Seagrass ecosystem services and their variability across genera and geographical regions. *PLoS one*, 11(10), e0163091.

120. As described by Murphy, G. E., Dunic, J. C., Adamczyk, E. M., Bittick, S. J., Côté, I. M., Cristiani, J., ... & Wong, M. C. (2021). From coast to coast to coast: ecology and management of seagrass ecosystems across Canada. *Facets*, 6(1), 139-179.

Seagrass are threatened by numerous interacting variables, many similar to other blue carbon ecosystems, such as, coastal erosion, extreme storms, marine heat waves, human disturbance, sea level rise, decrease salinity due to increased runoff and ocean freshening, sediment disturbance, and nutrient limitation. The loss of seagrass presents a unique threat to further loss as it creates a negative feedback loop, reinforcing the degradation and limiting recovery. Seagrass meadows calm and stabilise sediments, supporting the water clarity and light availability seagrass depend upon.<sup>121</sup>

Although climate change is proving detrimental to seagrass meadows in temperate waters, it presents new opportunities for Arctic seagrass. Along Arctic coasts eelgrass biomass and extent seem to be increasing. Warmer ocean temperature and higher light availability due to reduced ice and snow cover, are predicted to continue to expand the northward habitat range.<sup>76</sup> Marbà et al. (2018) indicate that current and projected warming conditions, under IPCC projections, that the Arctic Ocean will experience may enhance eelgrass growth.<sup>122</sup>

Eelgrasses along the Canadian Arctic coast have an increasingly important role as their habitat and carbon sequestration ability grow due to climate change. The lack of long-term studies regarding the distribution and health of seagrass in the Canadian Arctic, especially the high Arctic coast, present challenges in the effective management and study of populations, due to the minimal baseline data to compare potential future changes in extent and biomass to.

## COASTAL SHELVES AND OCEAN SEDIMENTS

The coastal shelf along the Canadian coast of the Arctic Ocean is significantly larger than any other Canadian coastal shelf, covering approximately 1.2 million square kilometres, as described in Canada's Arctic Ocean continental shelf submission to the Commission on the Limits of the Continental Shelf.<sup>123</sup> Although not considered blue carbon ecosystems in their own right, continental shelves, through their distinct geographical and biological features, such as the water's depth and the nutrient availability, facilitate large amounts of carbon sequestration. These shelves also provide suitable habitat for blue carbon ecosystems, facilitating their blue carbon uptake. Arctic Ocean shelves are unique, being especially broad and shallow (<200 m deep), making up as much as 50 per cent of the Arctic Ocean floor. The process that facilitates this large carbon uptake is a mechanism called the 'continental shelf pump'.<sup>124</sup> The high biological production in shelf surface waters sinks carbon while strong currents push the cold, dense waters, rich in carbon, down the shelf to be either buried in self sediments or pushed off the shelf to the water column of the deep ocean.<sup>125</sup>

The majority of water entering the Canadian Arctic Ocean flows from the Pacific Ocean, passing through the Bering and Chukchi Seas, bringing nutrient inputs to the shallow coastal shelf waters and exists through the Beaufort gyre out through Baffin Bay and Davis Strait. The high nutrient concentration within the waters supports high rates of primary production, with new production of up to 160 g C m<sup>-2</sup>yr<sup>-1</sup>.<sup>126</sup> This high productivity

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121. van der Heide, T., van Nes, E. H., van Katwijk, M. M., Olff, H., & Smolders, A. J. (2011). Positive feedbacks in seagrass ecosystems—evidence from large-scale empirical data. *PLoS one*, 6(1), e16504.

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124. Tsunogai, S., Watanabe, S., & Sato, T. (1999). Is there a "continental shelf pump" for the absorption of atmospheric CO<sub>2</sub>? *Tellus B: Chemical and Physical Meteorology*, 51(3), 701-712.

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126. Hill, V., & Cota, G. (2005). Spatial patterns of primary production on the shelf, slope and basin of the Western Arctic in 2002. *Deep Sea Research Part II: Topical Studies in Oceanography*, 52(24-26), 3344-3354.

can result in a large amount of carbon deposited in the shelf sediments or into the central Arctic Ocean.<sup>102, 127</sup> Primary production rates vary spatially, with the primary inflow shelves experiencing the highest rates of nutrient input and subsequent primary production, the interior shelves experiencing moderate to low primary production, and central Arctic Ocean experiencing the lowest primary production.<sup>128</sup> Due to the structure of the Arctic shelves, being extremely broad and shallow, and the high levels of primary production that occur on these shelves, they are an ideal region for carbon export and eventual burial in shelf sediments.

In the winter, coastal, shelf waters become colder than the adjacent open water due to a lack of water mixing, increasing both the density of shelf waters and solubility of CO<sub>2</sub>, allowing more CO<sub>2</sub> to diffuse from the atmosphere into the shelf waters. As these shelf waters then flow down the continental slope either being buried or sinking to the deep ocean, the waters take the absorbed CO<sub>2</sub> and detritus matter containing carbon with it.<sup>129</sup> In the Arctic Ocean the flow of the colder, dense water off the shelf into the central basin relies on the inflowing waters to the Arctic Ocean that pass over these large shelves. These shallow, broad, shelves unique to the Arctic are critical for the long-term storage of blue carbon in sediments. The shelves facilitate the circulation of carbon throughout not only the Arctic Ocean but the global ocean, driving cold, carbon rich, waters to the ocean floor depositing carbon in both shelf and deep ocean sediments where, if undisturbed, carbon can be stored for millennia. However, these Arctic shelf ecosystems are highly vulnerable to changing ocean and climate dynamics associated with climate change, including the continual loss of sea ice, coastal erosion, ice gouging and scouring, changing river runoff, and warming surface waters.<sup>46</sup> Given both the vulnerability and the role of shelf and deep ocean sediment in carbon burial and the dominant role Arctic continental shelves play in ocean circulation, any activities which may disturb either Arctic coastal shelves or seafloor sediment must be considered with a blue carbon lens.

## THREATS

Recalling that the delineation of the Arctic coastal region and ocean is unique and not as clear as other regions due to the land fast ice and permanent ice cover in the region we have considered threats both to the coastal and ocean region below. Threats to Arctic coastal blue carbon ecosystems and their subsequent carbon sequestration and held stocks, include climate change, warming induced permafrost melt, ocean acidification, and human activity.

## CLIMATE CHANGE

The Canadian Arctic is warming at rates 3 times faster than global averages and has experienced the greatest observed reductions of sea ice cover duration and concentration<sup>130, 131</sup> vastly impacting all aspects of this region, including the coastlines, the living organisms within it, and the region's ability to sequester carbon.<sup>132, 133, 134, 135</sup>

127. von Schuckmann, K., Le Traon, P. Y., Smith, N., Pascual, A., Brasseur, P., Fennel, K., ... & Zuo, H. (2018). Copernicus marine service ocean state report. *Journal of Operational Oceanography*, 11(sup1), S1-S142.

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132. Bush, E. and Lemmen, D.S., editors (2019): Canada's Changing Climate Report; Government of Canada, Ottawa, ON. 444 p.

133. Jansen, E., Christensen, J. H., Dokken, T., Nisancioglu, K. H., Vinther, B. M., Capron, E., ... & Stendel, M. (2020). Past perspectives on the present era of abrupt Arctic climate change. *Nature Climate Change*, 10(8), 714-721.

134. Meier, W. N., Hovelsrud, G. K., Van Oort, B. E., Key, J. R., Kovacs, K. M., Michel, C., ... & Reist, J. D. (2014). Arctic sea ice in transformation: A review of recent observed changes and impacts on biology and human activity. *Reviews of Geophysics*, 52(3), 185-217.

135. Serreze, M. C., & Stroeve, J. (2015). Arctic sea ice trends, variability and implications for seasonal ice forecasting. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 373(2045), 20140159.

It is predicted that, without taking action to reduce climate change, the Arctic will be ice-free each summer before 2050.<sup>136</sup>

According to recent IPCC assessments, Arctic air temperature has likely increased by more than double the global average within the last two decades, with decreased sea ice and snow cover creating a feedback loop contributing to further warming. During the winters of 2016 and 2018, mean Arctic air temperatures were 6°C above the 1981–2010 average.<sup>93</sup> The increase in air temperature directly contributes to warming surface water temperatures.<sup>137</sup>

An increase in both mean air and water temperature in the Arctic can influence blue carbon through numerous mechanisms, such as changes in ocean chemistry, ice formation, the duration and physical constraints on primary production, food web connections and processes, biomass growth rates, and releases of land-based sources of carbon into the ocean. As the Arctic Ocean continues to warm, its ability to sequester carbon lessens. Warmer surface waters absorb less carbon from the atmosphere and contribute to increased ocean thermal stratification, altering ocean circulation and decreasing vertical mixing of both carbon and nutrients to and from surface waters.<sup>93</sup> This presents a feedback loop, amplifying Arctic warming. As ocean temperatures and stratification increase, while circulation and salinity decreases, less carbon is able to diffuse into surface waters, further warming the atmosphere.

The warming of Arctic air and waters directly increases the threat of glacial and sea ice melt. This increases runoff and freshwater inputs to coastal ecosystems, decreases water salinity, increases glacial scouring, increases coastal erosion from storm surges as land fast ice decreases, and decreases mixing and nutrient supply to coastal ecosystems.<sup>93, 126, 127, 131, 138</sup>

Sea ice melt, glacial melt and caving directly results in sea level rise and freshwater runoff. Sea level rise is extremely harmful to Arctic coastal ecosystems, as while sea levels rise and the seaward edge of the intertidal zone is increasingly submerged, the upslope landward migration of wetlands is necessary for the ecosystem's survival.<sup>139</sup> A phenomena called coastal squeeze, where this upslope migration of coastal ecosystems is prevented due to coastal development. This negatively impacts the coastal ecosystems, limiting their habitat and biomass, and thus impacting their blue carbon stocks.<sup>140,141</sup> Lovelock and Reef (2019) use IPCC projected changes in coastal ecosystems to evaluate the change in global mean carbon stocks and rates of carbon sequestration resulting from the expected sea level rise. They predict blue carbon ecosystems could see gains in habitat due to sea level rise, in the order of 1.5 Pg to 2100, but only if coastal squeeze is minimised. If coastal squeeze is not minimised, losses of blue carbon habitat are expected, resulting in CO<sub>2</sub> emissions in the range of 3.4 Pg to 2100. However, the changes in mangrove ecosystems due to sea level rise, which are not found in the Arctic, were found to have the largest influence on the outcomes for global blue carbon.<sup>135</sup> Data gaps and uncertainties remain regarding the effects sea level rise may have on Arctic coastal ecosystems.

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136. Hwang, B., Aksenov, Y., Blockley, E., Tsamados, M., Brown, T., Landy, J., ... & Wilkinson, J. (2020). Impacts of climate change on Arctic sea-ice. *MCCIP Sci Rev*, 208-227.

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139. Barnes, D. K. A. (2019). Blue Carbon Sinks on Polar Seabeds and Their Feedbacks on Climate Change. In *Conference of the Arabian Journal of Geosciences* (pp. 71-73). Springer, Cham.

140. Schuerch, M., Spencer, T., Temmerman, S., Kirwan, M.L., Wolff, C., Lincke, D., McOwen, C.J., Pickering, M.D., Reef, R., Vafeidis, A.T., et al. (2018). Future response of global coastal wetlands to sea-level rise. *Nature* 561, 231–236.

141. Lovelock, C. E., & Reef, R. (2020). Variable impacts of climate change on blue carbon. *One Earth*, 3(2), 195-211.



Ice scouring, as a result of sea ice and glacial breakup and melt directly impacts blue carbon along the Canadian Arctic coast. Ice scouring results in coastal erosion, endangering blue carbon ecosystem habitat, disturbs coastal ecosystems carbon stocks through ecosystem disturbance, and potentially releases stored carbon through sediment disturbance.<sup>132, 133</sup>

PanArctic rates of freshwater runoff to Arctic Ocean coastal ecosystems have increased substantially between 1980 and 2010, from  $3900 \pm 390 \text{ km}^3$  to  $4200 \pm 420 \text{ km}^3$ .<sup>142</sup> Decreased salinity directly impacts the amount of carbon that is able to diffuse from the atmosphere into the surface waters as well negatively impacts blue carbon ecosystems such as eelgrass, as discussed previously.<sup>135</sup> Decreased salinity decreases the solubility of carbon within the ocean waters, as well as its ability to sink due to water density, inhibiting the diffusion of atmospheric carbon into surface waters and eventual sinking and storage of dissolved carbon.<sup>143</sup>

Arctic Sea ice is decreasing by roughly 13.1 per cent per decade at the time of minimal extent in the summer (September 1979–2020), and by ~2.6 per cent per decade during the winter (March 1979–2018).<sup>144, 145</sup> Land fast sea ice plays a crucial role in Arctic coastal protection from erosion due to extreme storms and increased temperatures. Sea ice creates a barrier from the Arctic coast to the open ocean. This lessens the effects intense open ocean storms and waves can have on coastal communities, ecosystems, and sediment, as well as protects against erosion of the coastline by controlling the delivery of heat to the coast. Coastal erosion and disturbance of coastal ecosystems and sediment is detrimental to blue carbon. Coastal erosion from storms and permafrost melt negatively inhibits blue carbon ecosystems through habitat loss and changes in nutrient supply, affecting their biomass and subsequent carbon stocks and sequestration.<sup>146</sup> The disturbance of sediment can result in release of stored carbon into the coastal waters and potentially back into the atmosphere. As the amount of ice separating Canadian arctic coasts from open water decreases and subsequent protection from coastal erosion, Barnhart et al., (2014) predicts a panArctic increase in the duration and intensity of storms, leading to increased rates of coastal erosion.<sup>147</sup>

Finally, sea ice and glacial melting results in an increase in ocean stratification, induced by upper layer freshening and increased runoff, and limits nutrient mixing. This limits the availability of nutrients necessary for primary production, causing decreases in, as mentioned previously coastal Arctic vegetation, as well as phytoplankton biomass and carbon uptake, as a result of a shift to favour smaller phytoplankton cells. This favouring of low energy systems may alter entire food web and carbon cycling processes. This stratification of the upper layer of the Arctic Ocean also prevents the downward mixing of carbon absorbed from the atmosphere into the surface waters. Without this mixing carbon is unable to descend the water column to the ocean floor, becoming either buried in sediment or consumed by organisms along the way.<sup>148</sup>

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142. Haine, T. W., Curry, B., Gerdes, R., Hansen, E., Karcher, M., Lee, C., ... & Woodgate, R. (2015). Arctic freshwater export: Status, mechanisms, and prospects. *Global and Planetary Change*, 125, 13-35.

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145. Shupe, M. D., Rex, M., Dethloff, K., Damm, E., Fong, A. A., Gradinger, R., ... & Sommerfeld, A. (2020). The MOSAIC expedition: A year drifting with the Arctic sea ice. *Arctic report card*.

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147. Barnhart, K. R., Overeem, I., & Anderson, R. S. (2014). The effect of changing sea ice on the physical vulnerability of Arctic coasts. *The Cryosphere*, 8(5), 1777-1799.

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## PERMAFROST MELT

As the Arctic warms, as does the perennially frozen ground known as permafrost, potentially resulting in landscape changes or ground collapse. Directly impacting the foundation upon which much of the coastal Canadian Arctic relies on.<sup>149</sup> The IPCC reports currently estimate roughly 20 percent of Arctic land permafrost is vulnerable to abrupt permafrost thaw and ground subsidence.<sup>93</sup> The resulting ground collapse and reshaping of landscapes directly impacts the infrastructure, cultural sites, and land based natural resources of Inuit communities and way of life. The melting of permafrost also presents a large threat to blue carbon and other carbon sequestering coastal ecosystems, such as kelp, salt marshes, eelgrass, and coastal shelves, as well as induces potential release of stored carbon.<sup>150, 151</sup> Coastal permafrost thaw can liberate peat and permafrost-derived carbon from soils and discharge it into coastal marine ecosystems through runoff, disturbing food webs, ocean dynamics, primary production, and the carbon storage of these coastal ecosystems through altered nutrient or carbon availability. Permafrost melt can also modify the physical and physicochemical environment, through coastal and habitat erosion and destruction, decreased water clarity and light penetration, and hindered carbon cycling and storage, among other threats, all impacting the biomass, extent, and health of coastal Arctic ecosystems.<sup>93, 140, 152</sup>

Global projections indicate, within the Arctic future permafrost melt and subsequent discharge of terrestrial carbon via runoff to the coastal ocean will continue to worsen and the rate of increase may accelerate over much of the Arctic during the coming decades.<sup>136, 153</sup>

## OCEAN ACIDIFICATION

As the ocean continues to absorb CO<sub>2</sub> from the atmosphere, buffering much of the potential impacts of climate change felt by humans, ocean water pH decreases. In particular, dissolved CO<sub>2</sub> forms a weak acid in ocean water, causing the pH and CO<sub>2</sub><sup>-3</sup> concentrations to decrease leading to ocean acidification and an undersaturation of aragonite.<sup>31, 154</sup> This affects many aspects of the ocean including surface water carbon saturation, sea ice retreat, increases in air temperatures, health of marine calcifiers, primary production, ocean stratification, nutrient supply to coastal ecosystems, and ocean biogeochemical cycles.<sup>93</sup> While Arctic Ocean acidification negatively impacts some species such as red king crab and Arctic cod<sup>155</sup>, photosynthesizing organisms such as seagrass and kelp may benefit from the increase in carbon.

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149. Farquharson, L. M., Romanovsky, V. E., Cable, W. L., Walker, D. A., Kokelj, S. V., & Nicolsky, D. (2019). Climate change drives widespread and rapid thermokarst development in very cold permafrost in the Canadian High Arctic. *Geophysical Research Letters*, 46(12), 6681-6689.

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152. González-Eguino, M., & Neumann, M. B. (2016). Significant implications of permafrost thawing for climate change control. *Climatic Change*, 136(2), 381-388.

153. Brown, K. A., Holding, J. M., & Carmack, E. C. (2020). Understanding regional and seasonal variability is key to gaining a Pan-Arctic perspective on Arctic Ocean freshening. *Frontiers in Marine Science*, 7, 606.

154. Terhaar, J., Kwiatkowski, L., & Bopp, L. (2020). Emergent constraint on Arctic Ocean acidification in the twenty-first century. *Nature*, 582(7812), 379-383.

155. Pilcher, D.J., D.M. Naiman, J.N. Cross, A.J. Hermann, S.A. Siedlecki, G.A. Gibson, and J.T. Mathis (2019): Modeled effect of coastal biogeochemical processes, climate variability, and ocean acidification on aragonite saturation state in the Bering Sea. *Front. Mar. Sci.*, 5, 508, doi: 10.3389/fmars.2018.00508.

Ocean acidification negatively affects the biophysical processes of Arctic marine invertebrates.<sup>156</sup> Many of the coastal Arctic marine organisms, that rely on blue carbon ecosystems, are calcifying organisms susceptible to dissolution at reduced availability of carbonate ions.<sup>157</sup> The increased concentration of carbon and decreased pH of the ocean negatively impact the saturation levels of minerals such as aragonite and calcite. Both these minerals are produced by marine calcifiers and are essential in the production of calcium carbonate shells and skeletons. Ocean water pH and CO<sub>2</sub> saturation levels reduce the saturation states and availability of these calcium carbonate minerals, which planktonic and benthic calcifying biota rely upon to form shells and skeletons.<sup>148, 158</sup> These negative impacts from ocean acidification on invertebrates can reverberate across the Arctic marine food web.<sup>72, 159, 160</sup>

The acidification-induced change in the calcium carbonate saturation of the water column and sediments, greatly affecting the diffusion of carbon into the Arctic Ocean and coastal blue carbon ecosystem subsequent ability to sequester carbon. The percentage of increased aragonite undersaturated vertical area of the arctic ocean water column increased from 5% in 1994 to 31% in 2010, with an average rate of increase of 1.5% per year.<sup>161</sup> This dramatic acidification of the Arctic Ocean and its coastal ecosystems is expected to worsen. Qi et al., (2017) predict surface waters of the Arctic Ocean will be entirely undersaturated with respect to aragonite approximately within the next two decades.<sup>155</sup>

This is due to the accelerated warming the Arctic is experiencing. The large input of river and melt water, resulting from glacial, sea ice, and snow melt, diluting calcium carbonate concentrations, and the Arctic Oceans inherent enhanced ability to absorb atmospheric carbon, due to its cold waters and saliency.<sup>147, 162</sup> This diminishing of the Arctic Oceans inherent carbon sequestration abilities is coupled with a reduction in primary production and physiological alterations to phytoplankton resulting from ocean warming and acidification.<sup>148, 152</sup> This reduction is expected to slow the sinking of organic carbon to the deep ocean and eventually to the sediments by 10 to 15 per cent by the year 2100 utilising high emission forecasts.<sup>163</sup> The rapid acidification of the Arctic Ocean is another unique factor which has the potential to affect carbon sequestering coastal ecosystems and organisms potential to contribute to blue carbon within the region and counteracting the effects of acidification is an area which could be considered in the context of NbCS.

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156. Watson, S. A., Peck, L. S., Tyler, P. A., Southgate, P. C., Tan, K. S., Day, R. W., & Morley, S. A. (2012). Marine invertebrate skeleton size varies with latitude, temperature and carbonate saturation: implications for global change and ocean acidification. *Global Change Biology*, 18(10), 3026-3038.

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163. Flombaum, P., Wang, W. L., Primeau, F. W., & Martiny, A. C. (2020). Global picophytoplankton niche partitioning predicts overall positive response to ocean warming. *Nature Geoscience*, 13(2), 116-120.

## HUMAN DISTURBANCE

Human disturbance of the Arctic Ocean and its coastal environment is expected to continually worsen as newly ice-free waters increase the accessibility of Arctic waters to human exploration and potential exploitation. Activities such as bottom trawling which drags large nets along the open ocean and coastal shelves, resource exploration and extraction, and increased shipping traffic, can disturb both stored carbon within sediments and carbon stocks stored within ecosystems as well as the ecosystem itself and its future ability to sequester carbon.<sup>135, 152</sup> These human induced activities can impact sensitive Arctic coastal ecosystems and in turn blue carbon sequestration through sediment and habitat disturbance, coastal development, increased nutrient pollution, and food web alterations.<sup>135</sup>

Coastal development presents increasingly alarming threats to coastal blue carbon ecosystems along the coastlines. As development along the Canadian Arctic increases, so does the risk of 'coastal squeeze', limiting the upslope migration of coastal ecosystems. This negatively impacts the coastal ecosystems, limiting their habitat and biomass, and thus impacting their blue carbon stocks.<sup>134, 135</sup> Human activities and development can also result in alterations of nutrient and sediment supply to coastal ecosystems which can also increase risk of coastal ecosystem submergence, for example, the damming of rivers, alters the capacity of coastal wetlands to accrete sediment.<sup>128, 152</sup>

Finally, human influences on biological processes such as the Arctic food web can have detrimental impacts on blue carbon storage and stock within coastal ecosystems. Loss of predators from blue carbon ecosystems through human activities such as overfishing may reduce carbon sequestration. This is because many commercially relied upon species heavily regulate the activity of grazers and bioturbators, directly impacting the biomass and extent of blue carbon ecosystems and thus levels of primary production.<sup>128, 152, 164</sup>

More comprehensive research and monitoring is needed to fully understand the impact human activities and their derived effects may have on Canadian Arctic coastal ecosystems and their carbon stocks and sequestration abilities.

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164 Seeger, I., McDonald, H., Wienrich, N., & Riedel, A. (2022). The Arctic blue economy.

# PART 3: BLUE CARBON ACCOUNTING & OFFSETS IN ARCTIC COASTAL ECOSYSTEMS

International organizations, such as The Blue Carbon Initiative, have made accounting for the blue carbon sequestered and/or stored within coastal blue carbon ecosystems and marine sediment a high priority. Determining the carbon stores in marine ecosystems and sediment, as well as the sequestration capacity of the wetlands and tidal areas across the global ocean, and Inuit Nunangat, is critical to effective and appropriate management. Determining these values provides nations with monetary incentives, illustrating the vital importance of protecting and necessity for legal protection of standing stocks of carbon in blue carbon ecosystems and stored carbon in marine sediment.

Despite the importance of blue carbon, economic value estimates are not common for marine ecosystems, with no estimates pertaining to Arctic ecosystems.<sup>152</sup> Blue carbon is, however, not the only ecosystem service of monetary value provided by coastal Arctic ecosystems. Other extremely valuable ecosystem services include habitat creation for commercially dependent fish, improving food security for local communities, coastal and community protection, and climate mitigation, however, this section only attempts to discuss the monetary value of their carbon sequestration.

This section describes available blue carbon accounting in general terms and its application in Canada's Arctic. There are extremely large gaps regarding the extent and biomass of coastal, carbon sequestering, ecosystems, such as macroalgae, salt marsh, and seagrass in the Canadian Arctic. These gaps in western knowledge make creating estimates of the carbon sequestration contributions of these ecosystems, and the Arctic Ocean as a whole, extremely difficult. In this section available predictions of both Arctic and global blue carbon accounting will be utilized, however, as previously discussed due to the large under-representation of the importance of Arctic blue carbon, these extrapolations of contributions may be extremely underestimated.

The Arctic is a rapidly changing environment and as climate change continues to alter Arctic Ocean dynamics and ecosystems, as does it alter the oceans carbon sequestration and climate mitigation abilities. Filling these gaps in western knowledge is extremely important in order to properly inform policy and demonstrate the importance of the Arctic, while highlighting its contribution to climate mitigation.

There are no current estimates of the stand stock and stored carbon within the Arctic to allow economic valuations of its current blue carbon contribution. However, researchers such as Armstrong et al. (2019) utilize IPCC climate trajectories to predict how the Arctics capacity to sequester and store carbon will change as our climate continues to change. Their results show an increase in the net stored carbon within the Arctic Ocean of around 1 to 2.3 percent between 2006 and 2099, depending on the climate trajectory used. Representing an increase in its storage capacity equivalent to the value of between €27.6 billion and €1 trillion.<sup>152</sup> This valuation, however, represents the eternity of the Arctic Ocean with the available data, not solely the Canadian Arctic Ocean nor exclusively the contribution of coastal ecosystems, although their contribution to carbon capture is of the largest. This increase in carbon storing capacity is unique to the Arctic Ocean as climate change presents harmful effects to the blue carbon of many other marine regions. For example, Barange et al. (2017) has estimated the North Atlantic will potentially see a decline in carbon storage capacity equivalent to roughly €170-300 billion, between 2010 and 2099.<sup>165</sup>

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165. Barange, M., Butenschön, M., Yool, A., Beaumont, N., Fernandes, J. A., Martin, A. P., et al. (2017). The cost of reducing the north atlantic ocean biological carbon pump. *Front. Mar. Sci.* 3:290. doi: 10.3389/fmars.2016.00290

The majority of the resulting increase in the Arctic Oceans capacity to sequester and store carbon is due to the increased diffusive gradient from atmosphere to surface waters, as atmospheric carbon continues to increase, as well as the increase in growing season and primary production due to increased habitat and light availability, as a result of sea ice loss.<sup>72, 166</sup> However each ecosystem discussed within this paper will react differently to the effects of climate change. Without a comprehensive understanding of their extent and biomass along the Canadian Arctic coast, it is difficult to determine their current blue carbon capacity and contributions, as well as how this capacity will be altered by the effects of climate change. Presently we are able to utilize current known extents of such ecosystems along the Canadian Arctic coast, compare these distributions to others of similar species in more well researched areas, and utilizing their found blue carbon contributions or valuations, superimpose these values onto the known Canadian Arctic biomass. It is important to note however each ecosystem, even of the same species, may have differing levels of both primary production and carbon sequestration. It is known that high latitude ecosystems often have lower rates of primary production, due to harsh conditions including cold temperatures and limited light availability.<sup>160</sup> Therefore, it is important to note these comparisons are highly variable and highlight the importance for further research of Canadian Arctic blue carbon.

Kelp is of the most well researched blue carbon ecosystems in the Arctic and will therefore serve as an example of the currently possible Arctic blue carbon comparisons. However, large data exist regarding full extent and biomass of kelp along the Canadian Arctic coasts, specifically the high Canadian Arctic. This presents difficulties not only in determining the standing stock of carbon within these Canadian coastal ecosystems, but also the rate of carbon export and degree of storage, creating large barriers in determining an accurate estimation of kelp ecosystems blue carbon contribution within the Canadian Arctic.

In attempts to provide context regarding the contributions, importance, and need for protection of kelp within the Canadian Arctic, valuations of kelp from Australia will be used. However, it is important to note, productivity levels within kelp forests can vary greatly and productivity may be lessened slightly in the Arctic due to harsh environmental factors, when compared to kelp forests located in more temperate conditions such as Australia.

As described in the previous section, the total standing stock of carbon within kelp forests of the Eastern Canadian Arctic, alone, is 72.7 Tg C, accounting for over four times more than the standing stock of carbon within the kelp in all of Australia (16.6 Tg C).<sup>88</sup> Filbee-Dexter & Wernber (2020) utilized current best-estimates of the proportion of kelp primary production that becomes sequestered through burial in deep ocean sediments or transport below the mixed layer in the deep sea to calculate the carbon burial of Australian kelp. Although no monetary values were given, researchers revealed Australian kelp forests store 10.3–22.7 Tg C and contribute 1.3–2.8 Tg C year<sup>-1</sup> in sequestered production, amounting to more than 30% of total blue carbon stored and sequestered around the Australian continent, and ~3% of the total global blue carbon. This evaluation represents an average sequestration rate per unit area of kelp forest of 0.39 Mg C ha<sup>-1</sup> year<sup>-1</sup> (± 0.09 SD).<sup>88, 167</sup> Given this contribution and the magnitude of kelp within the Eastern Canadian Arctic alone, it suggests that the potential of Canadian Arctic kelp to contribute to global carbon storage is enormous.

Similarly, to other blue carbon ecosystems in the Arctic, more comprehensive research regarding biomass, rates of primary production, rates of sequestration, and storage is needed to accurately evaluate the blue carbon contribution of Canadian Arctic coastal ecosystems and to determine appropriate management measures for Canada's kelp forests and other blue carbon ecosystems.

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166. Ward, R. D. (2020). Carbon sequestration and storage in Norwegian Arctic coastal wetlands: Impacts of climate change. *Science of the Total Environment*, 748, 141343.

167. Kokubu, Y., Rothäusler, E., Filippi, J. B., Durieux, E. D., & Komatsu, T. (2019). Revealing the deposition of macrophytes transported offshore: evidence of their long-distance dispersal and seasonal aggregation to the deep sea. *Scientific reports*, 9(1), 1-11.

This valuation does, however, not include all the harmful effects climate change is and will continue to bring to the Arctic Ocean, including the coastal communities and ecosystems that rely upon it. Climate change has induced Arctic warming, changing climate and ocean dynamics, and drastic ice melt, resulting in increased coastal erosion, decreased food security and wellness of local communities, permafrost melt, more frequent and intense storms, warming waters. <sup>10, 34, 61, 72, 114, 168</sup>

Arctic blue carbon is also threatened by human disturbance as discussed in Part 3, including increased shipping traffic, increased human exploitation such as resource extraction and commercial fishing, and coastal development. These disturbances can result in both the release of stored carbon, in both sediments and ecosystems, and a decrease in the current and future sequestration capacity of coastal ecosystems, hindering carbon storage and climate mitigation. <sup>128, 134, 135, 152, 169</sup>

The Arctics, already considerably large, capacity to sequester and store carbon is expected to increase as climate change progresses and this climate mitigation ability will likely become more valuable and relied upon. However, the capacity to sequester carbon, as well as the already stored carbon is vulnerable to disturbance. To properly protect these ecosystems and inform policy, further research is vital to accurately assess the blue carbon capacities and contributions of Canadian Arctic coastal ecosystems and how climate change may affect this contribution.

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168. Eger, A., Marzinelli, E., Baes, R., Blain, C., Blamey, L., Carnell, P., ... & Verges, A. (2021). The economic value of fisheries, blue carbon, and nutrient cycling in global marine forests.

169. Seeger, I., McDonald, H., Wienrich, N., & Riedel, A. (2022). The Arctic blue economy.



# PART 4: FEDERAL LAWS & POLICIES

Canada's has a central role in blue carbon sequestration initiatives in Inuit Nunangat. This is due in large part because of its jurisdiction in the areas of oceans, fish, national parks and migratory bird sanctuaries, and relationship with Indigenous peoples as representative of the Crown. This section describes federal legislative and policy tools Canada has available to manage, protect and restore Arctic coastal blue carbon ecosystems. While written from the vantage point of Atlantic jurisdictions, the ECELAW Discussion Paper provides an very helpful overview of many of the federal laws that also apply in Inuit Nunangat. Further, WWF-Canada's paper, *Blue Carbon in Canada: A Federal Policy Review*<sup>170</sup> provides a complete catalogue of federal policies that would also have application in Inuit Nunangat. This section draws gratefully on these analyses and adds aspects that are unique to Canada's northern jurisdictions.

## 4.1 FEDERAL IMPACT ASSESSMENT LAWS & REGULATIONS

### CANADA IMPACT ASSESSMENT ACT<sup>171</sup>

Under the IAA, impact assessments are performed on projects that are to be carried out in Canada or on federal lands and that are designated by regulation. The influence of this Act is governed by its area of application, which is inherently a patchwork. Federal lands are defined as follows:

- (a) lands that belong to Her Majesty in right of Canada, or that Her Majesty in right of Canada has the power to dispose of, and all waters on and airspace above those lands, other than lands under the administration and control of the Commissioner of Yukon, the Northwest Territories or Nunavut;
- (b) the following lands and areas:
  - (i) the internal waters of Canada, in any area of the sea not within a province,
  - (ii) the territorial sea of Canada, in any area of the sea not within a province,
  - (iii) the exclusive economic zone of Canada, and
  - (iv) the continental shelf of Canada; and
- (c) reserves, surrendered lands and any other lands that are set apart for the use and benefit of a band and that are subject to the Indian Act, and all waters on and airspace above those reserves or lands.<sup>172</sup>

From the forgoing and for the purposes of the jurisdictions reviewed in this Discussion Paper, the IAA applies to federal lands in Manitoba, Ontario, Quebec and to the marine waters that border those jurisdictions. While none have been listed thus far, the IAA does not apply to activities to be performed on lands subject to a land claim agreement is listed in Schedule 2. As noted in the definition of federal lands, the IAA also does not apply in Yukon, in Nunavut or in NWT except within the Inuvialuit Settlement Region.

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170. 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.

171. *Impact Assessment Act*, S.C. 2019, c. 28, s. 1 [IAA].

172. IAA, s. 2.

The *Physical Activities Regulations*<sup>173</sup> lists the types of projects that come within the ambit of the IAA and require an impact assessment. Relevant to later sections of this Discussion Paper, the Project List includes certain physical activities in National Parks and Protected Areas, including migratory bird sanctuaries and marine protected areas. These regulations also designate various physical activities in the offshore and that would implicate the coastline as well as marine terminals that can harbour ships larger than 25000 DWT.

The Minister of Environment and Climate Change may also designate a project upon request or on their own initiative.<sup>174</sup> The Minister may exercise this authority if the carrying out of the project may cause adverse effects within federal jurisdiction or adverse direct or incidental effects, or public concerns related to those effects warrant the designation.<sup>175</sup> Notably, this authority permits consideration of “exceptional circumstances” including the location of a project in a sensitive area, the impact on Canada’s ability to meet its climate change commitments and the ability of the impacts to be managed through other legislation.<sup>176</sup>

Once a project is designated, the IAA requires the consideration of factors that could invite an evaluation of impacts on blue carbon ecosystems. These include: effects on the environment; cumulative effects; the impact on Canada’s ability to meet its environmental obligations and its commitments in respect of climate change.<sup>177</sup> Notably, “any study or plan that is conducted or prepared by a jurisdiction [...] that is in respect of a region related to the designated project and that has been provided with respect to the project”<sup>178</sup> must also be considered. This may provide an avenue for WWF-Canada to support Indigenous and other jurisdictions prepare project-specific studies relating to impacts on blue carbon ecosystems that can then form part of an impact assessment.

## STRATEGIC AND REGIONAL ASSESSMENTS UNDER THE IAA

Beyond project-specific assessments, regional and Strategic Assessments are tools that can be used to incorporate considerations about blue carbon ecosystems into impact assessment and other review processes. The IAA empowers the Minister to authorize a regional assessment of the effects of existing or future physical activities carried out in a region that is entirely on federal lands and, though agreement or otherwise, conduct such an assessment on other lands as well.<sup>179</sup>

The IAA also empowers the Minister to authorize an assessment of any Government of Canada policy, plan or program — proposed or existing — that is relevant to conducting impact assessments; or any issue that is relevant to conducting impact assessments of designated projects or of a class of designated projects.<sup>180</sup> The federal *Strategic Assessment of Climate Change*, applies to designated projects under the IAA and requires consideration of carbon sinks:

The calculation of a project’s net GHG emissions accounts for emissions related to land-use change. Proponents must also provide a qualitative description of the project’s positive or negative impact on carbon sinks. This is because some projects may improve or reduce the ability of an ecosystem, land area or ocean to absorb carbon dioxide from the atmosphere. An impact on a carbon sink implies the interruption or alteration of a natural continual process that removes carbon from the atmosphere.<sup>181</sup>

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173. *Physical Activities Regulations*, SOR/2019-285. [Project List]

174. IAA, s. 9(1).

175. Operational Guide: Designating a Project under the Impact Assessment Act, May 19, 2022 (accessed online: <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/designating-project-impact-assessment-act.html>, November 22, 2022).

176. *Ibid.*

177. IAA, s. 22(1)(a) and (i)

178. IAA, s. 22(1)(j)

179. IAA, s. 92 and 93.

180. IAA, s. 95.

181. Environment and Climate Change Canada, *Strategic Assessment of Climate Change*, Revised, October 2020 (accessed online: <https://www.canada.ca/en/services/environment/conservation/assessments/strategic-assessments/climate-change.html#toc3>, November 22, 2022) s. 5.1.2.

In addition to requiring consideration of marine-based sequestration in project approvals, regional and strategic assessments can help provide benchmarks for stakeholders.

### **MACKENZIE VALLEY RESOURCE MANAGEMENT ACT<sup>182</sup>**

The MVRMA applies in the Northwest Territories outside of the Inuvialuit Settlement Region. While the Mackenzie River is an important contributor to blue carbon ecosystems that thrive along the coasts of the Beaufort Sea and spends much of its life in the region to which the MVRMA applies, this Act is beyond the geographic scope of this Discussion Paper.

### **YUKON ENVIRONMENTAL AND SOCIO-ECONOMIC ASSESSMENT ACT<sup>183</sup>**

The YESAA applies throughout Yukon and serves to give effect to provisions of the *Umbrella Final Agreement* respecting assessment of environmental and socio-economic effects.<sup>184</sup> In other words, it has a basis in modern treaty objectives. In the North Slope region, which encompasses the northern coast of Yukon, the YESAA applies alongside the regulatory framework established pursuant to the Inuvialuit Final Agreement, to be detailed in Phase 2.<sup>185</sup> The YESAA states that the IAA does not apply anywhere in the Yukon,<sup>186</sup> however, the IAA would apply to those lands within Ivvivik National Park, though many minor Parks-related assessments have been excluded through the Project List. In short, a project could trigger three environmental assessment regimes in the North Slope.

YESAA's definition of environment is holistic and includes air, land and water; all layers of the atmosphere; all organic and inorganic matter and living organisms; and, the interacting natural systems comprised of those components.<sup>187</sup> The purposes of YESAA are also broad. Listed are the protection and maintenance of "environmental quality and heritage resources" and the protection and promotion of "the well-being of Yukon Indian persons and their societies and Yukon residents generally, as well as the interests of other Canadians".<sup>188</sup> The factors to be considered in a project assessment include the "significance of any adverse cumulative environmental or socio-economic effects that have occurred or might occur in connection with the project," interests of first nations, Yukon residents and other Canadians and "any matter specified by the regulations".<sup>189</sup> These categories do not exclude blue carbon ecosystems, though, neither these nor the Regulations reference climate change mitigation or carbon sequestration specifically. Unless a decision-maker is already versed in blue carbon sequestration potential, its consideration would not be guaranteed.

Two tools that may be used to incorporate blue carbon ecosystems into impact assessment decision-making are regional land use plans and mitigative measures. Under the YESAA, a project must be assessed for conformity with a regional land use plan established under a final agreement for the location of the proposed project.<sup>190</sup> This is limited, however, to those final agreements incorporating terms of the *Umbrella Final Agreement* and excludes the *Inuvialuit Final Agreement*. YESAA also authorizes the development of standard mitigative measures that can be applied to a class of projects, or to projects located within a geographic area.<sup>191</sup> In the case of the North Slope, the Dawson District Office, which is responsible for the "North" assessment district or the Yukon Environmental and Socio-economic Assessment Board (YESAB) could identify blue carbon ecosystem locations as requiring particular mitigative measures<sup>192</sup> applied with respect to any project.

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182. *Mackenzie Valley Resource Management Act*, S.C. 1998, c. 25. [MVRMA]

183. *Yukon Environmental and Socio-economic Assessment Act*, S.C. 2003, c. 7. [YESAA]

184. YESAA, s. 5(1).

185. This overlap of assessment regimes has been a point of contention for residents of this area.

186. YESAA, s. 6.

187. YESAA, s. 2(1).

188. YESAA, s. 5.

189. YESAA, s. 42(1).

190. YESAA, s. 44(1).

191. YESAA, s. 37(1).

192. Measures for the elimination, reduction or control of adverse environmental or socio-economic effects.

## NUNAVUT

Impact assessment in Nunavut is governed by the Nunavut Agreement. This Agreement established the Nunavut Planning Commission and the Nunavut Impact Review Board with the latter assigned the responsibility for both screening and assessing the impact of proposed major projects in the Nunavut Settlement Area.<sup>193</sup> While the *Nunavut Planning and Project Assessment Act*<sup>194</sup> is a federal statute that serves to set out a regime for land use planning and project assessment for the onshore and could have implications for blue carbon sequestration efforts, it is subordinate to the Nunavut Agreement and is more appropriately addressed among the treaty-based regimes in the Phase 2 Discussion Paper.

## 4.2 FEDERAL FISHERIES & AQUACULTURE LAWS & REGULATIONS

### CANADA FISHERIES ACT<sup>195</sup>

As will be seen below, jurisdiction over the elements of blue carbon ecosystems and their tenants is shared between the federal government and provinces and territories. The *Fish and fish habitat protection policy statement, August 2019*, describes it this way:

While management of inland fisheries has largely been delegated to the provinces and the Yukon Territory, the administration of the fish and fish habitat protection provisions remains with the federal government across Canada. However, provincial and territorial authorities share a range of natural resource conservation responsibilities and initiatives under various provincial and territorial laws that complement those of the federal government. For example, land-use decisions made by these authorities may have a significant bearing on the quality, quantity and function of fish habitat in a given watershed.<sup>196</sup>

This subsection focuses on the legislation that is national in scope. Region-specific federal regulations are explained in those sections. The thinking is that the presence of modern and historical treaties will necessitate a regional approach to blue carbon ecosystem protection and regional snapshots would better help support this work.

At the federal level, due to its scope of application and purposes, the *Canada Fisheries Act* is central to any discussion about blue carbon sequestration. As with other statutes throughout this Discussion Paper, however, the most robust protections must be accessed through the role of blue carbon ecosystems as habitat for protected species.

This Act applies in Canada and all waters in the fishing zones (established by Order-in-Council),<sup>197</sup> the territorial sea (typically an area of 12 nautical miles from the low water line along the coast),<sup>198</sup> and internal waters of Canada (generally all lakes, rivers, harbours and some bays).<sup>199</sup> With respect to a sedentary species (any organism that, at the harvestable stage, either is immobile on or under the seabed or is unable to move except by remaining in constant physical contact with the seabed or subsoil), the *Fisheries Act* also applies to any portion of the continental shelf of Canada that is beyond the limits of the territorial sea.<sup>200</sup> This area of application includes the arctic coastlines across Inuit Nunangat, Hudson Bay and James Bay.

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193. *Nunavut Agreement*, Article 12(1).

194. *Nunavut Planning and Project Assessment Act*, S.C. 2013, c. 14, s. 2

195. *Fisheries Act* R.S.C., 1985, c. F-14.

196. Fisheries and Oceans Canada, *Fish and fish habitat protection policy statement, August 2019* (accessed online: <https://www.dfo-mpo.gc.ca/pnw-ppe/policy-politique-eng.html>, November 22, 2022), p. 10. [2019 Policy Statement]

197. *Fishing Zones of Canada (Zones 1, 2 and 3) Order* (C.R.C., c. 1547); *Fishing Zones of Canada (Zones 4 and 5) Order* C.R.C., c. 1548.

198. *Oceans Act*, S.C. 1996, c. 31, s. 4.

199. *Oceans Act*, S.C. 1996, c. 31, s. 6. The publication, DFO, *Canada's Ocean Estate: A Description of Canada's Maritime Zones* (accessed online: <https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/40622952.pdf>, November 22, 2022), includes a helpful diagram.

200. *Fisheries Act*, s. 2.2 (1)(b) and 2.2(2).

The purposes of the *Fisheries Act* include the conservation and protection of fish and fish habitat. The related provisions came into effect through Bill C-68 as part of a suite of environmental regulatory legislation in 2019. Fish habitat is defined as “water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply and migration areas”.<sup>201</sup> The Act prohibits any person from carrying on “any work, undertaking, or activity that results in the harmful alteration, disruption or destruction of fish habitat”,<sup>202</sup> unless that activity fits within the list of exceptions. The 2019 Policy Statement lists habitat degradation, including the impairment of ecological functions, and modification among interrelated factors that threaten fish habitat.<sup>203</sup>

The 2019 Policy Statement explains that in most cases, such exceptions “would be Ministerial authorizations granted to proponents in accordance with the Authorizations Concerning Fish and Fish Habitat Protection Regulations”. Further, this document explains that the “Department will apply a risk-based approach when evaluating the impacts of works, undertakings or activities on fish habitat. [... The] Department interprets “harmful alteration, disruption or destruction” as any temporary or permanent change to fish habitat that directly or indirectly impairs the habitat’s capacity to support one or more life processes of fish”.<sup>204</sup> The 2019 Policy Statement is to be reviewed every five years. The next Review Date would be August 27, 2024. An engagement period leading up to this review date should be anticipated. This would present an opportunity to identify blue carbon sequestration as an ecological function, which could open the door for protecting marine plants uniquely for those functions.

Bill C-68 also introduced into the *Fisheries Act* the authority to designate “ecologically significant areas” through regulation.<sup>205</sup> Prescribed works, undertakings and activities are prohibited in these areas unless they are authorized.<sup>206</sup> As of the date of writing, regulations establishing such an area have not been promulgated. In any event, while this authority might prove effective for blue carbon ecosystem stewardship, additional steps may be required in marine areas subject to modern treaties. This will be explored in Phase 2 of this Discussion Paper.

Beyond incidental protections of marine plants insofar as they perform the function of fish habitat, section 44 of the *Fisheries Act* prohibits the harvest marine plants in the coastal waters of Canada. Marine plant includes “all benthic and detached algae, marine flowering plants, brown algae, red algae, green algae and phytoplankton”. Harvesting includes “cut, take, dredge, rake or otherwise obtain”. To activate this prohibition, however, the Governor-in-Council must pass a regulation to that effect.<sup>207</sup> Further limiting the potential impact of this protection, the Minister in their sole discretion, can issue a license permitting the harvest of marine plants subject to the conditions they deem appropriate.<sup>208</sup> Acknowledging the paramountcy of Indigenous rights to harvest, the *Fisheries Act* clarifies that “traditional harvesting of marine plants by Indigenous persons for their use as food” may continue. It should be noted that Indigenous persons may have a right to harvest for commercial purposes.<sup>209</sup>

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201. *Fisheries Act*, s. 2(1)

202. *Fisheries Act*, s. 35(1).

203. 2019 Policy Statement, p. 7.

204. Fisheries and Oceans Canada, *Fish and fish habitat protection policy statement, August 2019* (accessed online: <https://www.dfo-mpo.gc.ca/pnw-ppe/policy-politique-eng.html>, November 22, 2022).

205. *Fisheries Act*, s. 35.2(2).

206. *Fisheries Act*, s. 35.2(1).

207. *Fisheries Act*, s. 46.

208. *Fisheries Act*, s. 45.

209. Precedents include: *R. v. Sparrow* [1990] 1 SCR 1075 (CanLII); *R. v. Van der Peet* [1996] 2 SCR 507 (CanLII), *R. v. Marshall* [1999] 3 SCR 456.

## **FISHERY (GENERAL) REGULATIONS<sup>210</sup>**

The *Fishery (General) Regulations* were enabled pursuant to the *Fisheries Act* in 1993.

These Regulations are intended to manage and control fishing and related activities, *inter alia*, in Canadian fisheries waters off the Arctic coast; fishing and related activities in the provinces of Quebec and in the Yukon Territory and Northwest Territories.<sup>211</sup> In short, these apply to regions where arctic blue carbon ecosystems would be found.

The *Federal (General) Regulations* authorize the Minister to apply conditions when granting a license to fish. Those conditions include the waters in which fishing is permitted to be carried out. While at one time these Regulations provided for authorizations for the alteration of fish habitat, this provision was repealed in 2013.<sup>212</sup> These Regulations do not otherwise refer to fish habitat or aquatic plants. In their current form, these Regulations are of limited utility for protecting blue carbon ecosystems.

## **CANADA AQUATIC INVASIVE SPECIES REGULATIONS<sup>213</sup>**

The *Canada Aquatic Invasive Species Regulations* were enabled pursuant to the *Fisheries Act* in 2015.

According to the Invasive Species Centre, invasive aquatic plants can form dense mats of vegetation that block sunlight, prevent native plants from growing and destabilize sustainable ecosystems.<sup>214</sup> While available data indicates that instances of invasive species in the Arctic remain few for the moment, an introduction of such species could have a significant adverse impact.<sup>215</sup> The 2017 *Arctic Invasive Alien Species (ARIAS) Strategy and Action Plan* indicates “the lack of overall species diversity may [...] make Arctic ecosystems particularly vulnerable to environmental change, including the impacts of invasive alien species.”<sup>216</sup>

The regulatory framework for aquatic invasive species does not currently target aquatic plants but could through legislative amendment process and Ministerial discretion as noted below. The only aquatic species defined to be invasive are those listed in parts 2 and 3 of the Schedule and the list does not include plants of any kind. The Governor-in-Council is authorized to amend this list of aquatic invasive species pursuant to section 43(1)(n) of the *Fisheries Act*.

If an invasive aquatic plant capable of undermining a blue carbon ecosystem were to be identified, the current prohibitions against importation, possession, and release,<sup>217</sup> would not apply. However, section 10 of these Regulations does prohibit any person from introducing “an aquatic species into a particular region or body of water frequented by fish where it is not indigenous unless authorized to do so under federal or provincial law”. Further, the Minister may treat or destroy any aquatic species in a particular region or body of water frequented by fish where the aquatic species is not indigenous and may harm fish, fish habitat or the use of fish.<sup>218</sup> These provisions apply to *all* aquatic species rather than just those listed in the Schedule and could be activated more quickly if an imminent threat to arctic blue carbon ecosystems was detected upon the collection of better data.

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210. *Fishery (General) Regulations*, SOR/93-53.

211. *Fishery (General) Regulations*, SOR/93-53, s. 3(1).

212. *Fishery (General) Regulations*, SOR/93-53, s. 58 (repealed).

213. *Aquatic Invasive Species Regulations*, SOR/2015-121.

214. Invasive Species Centre, *Invasive Aquatic Plants* (accessed online: <https://www.invasivespeciescentre.ca/invasive-species/meet-the-species/invasive-aquatic-plants/>, November 22, 2022).

215. Protection of the Arctic Marine Environment (PAME), Arctic Council Working Group, *Arctic Invasive Species* (accessed online: <https://www.pame.is/projects/arctic-invasive-species>, November 22, 2022), p. 11.

216. CAFF and PAME. 2017. *Arctic Invasive Alien Species: Strategy and Action Plan*, Conservation of Arctic Flora and Fauna and Protection of the Arctic Marine Environment Akureyri, Iceland. ISBN: 978-9935-431-65-3

217. *Aquatic Invasive Species Regulations*, s. 6-9.

218. *Aquatic Invasive Species Regulations*, 19(2).



## CANADA AUTHORIZATIONS CONCERNING FISH AND FISH HABITAT PROTECTION REGULATIONS<sup>219</sup>

The *Canada Authorizations Concerning Fish and Fish Habitat Protection Regulations* were made pursuant to the *Fisheries Act* as part of the 2019 amendments to that Act. These Regulations are largely administrative and outline the information, documentation, time limits and processes relating to an application for an authorization to carry on work that may result in the harmful alteration, disruption or destruction (HADD) of fish habitat under the s. 35(2) exceptions.

Schedule 1 of the Authorization Regulations outlines that which a proponent must provide in order to qualify for an exemption from the section 35 prohibitions against HADD. A proponent must provide, *inter alia*, in writing: a financial guarantee;<sup>220</sup> a description and the results of any consultations undertaken in relation to the proposed work, undertaking or activity, including with Indigenous communities or groups and the public;<sup>221</sup> a detailed description of the fish and fish habitat found at the location of the proposed work;<sup>222</sup> a detailed description of the likely effects of the proposed work, undertaking or activity on fish and fish habitat and the extent of anticipated damage;<sup>223</sup> a detailed description of the measures and standards that will be implemented; and, a detailed description of a plan to offset the HADD of fish habitat that were not offset by habitat credits.<sup>224</sup> Habitat credits refer to a unit of measure that is agreed to between any proponent and the Minister under section 42.02 of the *Fisheries Act* that quantifies the benefits of a conservation project.<sup>225</sup>

This list of requirements does improve accountability among proponents and the Minister in the evaluation and reporting on potential impacts to arctic blue carbon ecosystems. However, the design of these Regulations seems to limit opportunities for public evaluation of the standards being applied to proponents and implementation monitoring. For example, while *any* consultation efforts by the proponent must be reported, no particular standard or guidance is articulated. There also exists no requirement to notify to potential stakeholders who might wish to be consulted. Further, the communications and documentation may lie entirely between the Minister and the proponent, which could limit the benefit that could accrue to the public in terms of the research that the proponent has undertaken. Finally, as effectively noted in the ECELAW paper,<sup>226</sup> the HADD offset option is not viable for blue carbon ecosystems (and in particular those in the remote reaches of the Arctic).

## CANADA ABORIGINAL COMMUNAL FISHING LICENCES REGULATIONS<sup>227</sup>

The *Canada Aboriginal Communal Fishing Licences Regulations* were passed in 1993 pursuant to the *Fisheries Act*. These Regulations were intended to give effect to certain judicial decisions relating to Indigenous rights, including *R v. Sparrow*.<sup>228</sup>

Section 3(1) explains “these Regulations apply in respect of (a) fisheries in Canadian fisheries waters in and adjacent to Ontario, Quebec, Nova Scotia, New Brunswick, Prince Edward Island, Newfoundland and the Northwest Territories; (b) fisheries in the tidal waters in and adjacent to Manitoba; (c) fisheries in tidal waters in and adjacent to the Yukon Territory and fisheries in the Yukon Territory [...].”<sup>229</sup> These areas encompass significant areas within Inuit Nunangat and southern Hudson Bay and James Bay.

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219. *Authorizations Concerning Fish and Fish Habitat Protection Regulations*, SOR/2019-286. [*Authorization Regulations*].

220. *Authorization Regulations*, Schedule 1, s. 2(1).

221. *Authorization Regulations*, Schedule 1, s. 7.

222. *Authorization Regulations*, Schedule 1, s. 8.

223. *Authorization Regulations*, Schedule 1, s. 9.

224. *Authorization Regulations*, Schedule 1, s. 16.

225. *Fisheries Act*, s. 42.01.

226. ECELAW Discussion Paper, p. 76.

227. *Aboriginal Communal Fishing Licences Regulations*, SOR/93-332.

228. The Standing Joint Committee for the Scrutiny of Regulations, Report No. 71, 2002..

229. *Aboriginal Communal Fishing Licences Regulations*, s. 3(1).

These Regulations authorize the Minister to issue a communal licence to an Indigenous organization to carry on fishing and related activities.<sup>230</sup> The Minister may include conditions consistent with the *Fishery (General) Regulations*<sup>231</sup> for the purpose of management and conservation of fisheries.<sup>232</sup> As explained above, in their current form, *Fishery (General) Regulations* are of limited utility for protecting blue carbon ecosystems as they do not refer to habitat, plants or blue carbon. Of possible interest, these Regulations were reviewed by the Standing Joint Committee for the Scrutiny of Regulations in 2002, which found, among other things that they involved an unlawful subdelegation of authority.<sup>233</sup> While certain reviewed sections were amended, the Minister's authority to issue licenses, however, has been retained.

### **CANADA AQUACULTURE ACTIVITIES REGULATIONS<sup>234</sup>**

The *Canada Aquaculture Activities Regulations* were enabled pursuant to the *Fisheries Act* in 2015. Neither the Regulations nor the related guidance documents specify the area of application. As such, it is assumed that these apply within the same bounds as those identified under the *Fishery Act*.

According to DFO, the intent of these Regulations is to “clarify conditions under which aquaculture operators may install, operate, maintain or remove an aquaculture facility, or undertake measures to treat their fish for disease and parasites, as well as deposit organic matter, under sections 35 and 36 of the *Fisheries Act* [...] to mitigate detriments to fish and fish habitat”.<sup>235</sup>

Aquaculture is defined as “the cultivation of fish,” which continues to fish-centric approach to aquatic resources observed in the *Fisheries Act* and related regulations. This Regulation does not establish a prohibition on the harvesting of plants as provided for in s. 44 of the *Fisheries Act*. The relevance of this Regulations relates primarily to the limits placed on operators with respect to the deposit of substances that are deleterious to fish habitat.<sup>236</sup> The owner or the operator of the aquaculture facility must, in depositing a deleterious substance, take reasonable measures to minimize detriment to fish and fish habitat outside the facility. With the exception of tidal waters adjacent to Quebec, which have specific benthic substrate monitoring requirements, the *Aquaculture Monitoring Standard - 2018*<sup>237</sup> would apply in Inuit Nunangat, James Bay or southern Hudson Bay. It does not appear that impacts on seaweed are targeted in this Standard.

### **CANADA AQUACULTURE ACT (PENDING)**

ECELAW reported in its Discussion Paper that work is currently ongoing to develop a federal Aquaculture Act; that this work is being based on an engagement report that does not reference impacts on blue carbon ecosystems, carbon, or climate change considerations;<sup>238</sup> and, that there does not appear to be any consideration or assessment of the impacts of aquaculture or the need to consider the carbon implications of aquaculture.<sup>239</sup>

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230. *Aboriginal Communal Fishing Licences Regulations*, s. 4(1).

231. *Fishery (General) Regulations*, SOR/93-53.

232. *Aboriginal Communal Fishing Licences Regulations*, s. 5(1).

233. The Standing Joint Committee for the Scrutiny of Regulations, Report No. 71, 2002, p. 1.

234. *Aquaculture Activities Regulations*, SOR/2015-177.

235. DFO, *Aquaculture Activities Regulations* (accessed online: <https://www.dfo-mpo.gc.ca/aquaculture/management-gestion/aar-raa-eng.htm>, November 22, 2022).

236. *Aquaculture Activities Regulations*, SOR/2015-177, s. 3(1).

237. DFO, *Aquaculture Monitoring Standard – 2018* (accessed online: <https://www.dfo-mpo.gc.ca/aquaculture/management-gestion/aar-raa-ann7-eng.htm>, November 22, 2022).

238. Fisheries and Oceans Canada, “What we heard report: Proposed federal Aquaculture Act – 2020 general engagement”, (accessed online: <https://www.dfo-mpo.gc.ca/aquaculture/publications/report-potential-act-rapport-eventuelle-loi-eng.htm>, November 22, 2022).

239. Fisheries and Oceans Canada, “Considerations for a new Act”, (accessed online: <https://www.dfo-mpo.gc.ca/aquaculture/act-loi/considerations-eng.html>, November 22, 2022).

As of the date of writing, there have been no new announcements regarding the development or tabling of a federal aquaculture act. An additional note for consideration, DFO has indicated that “dialogue with Indigenous partners is ongoing”,<sup>240</sup> though it is unclear how current this is as 2021 is referenced. This is language is common where a federal initiative may impact Indigenous rights. Depending on how close a draft bill is to being finalized, there may be an opportunity to work with Indigenous partners to incorporate blue carbon sequestration and protection concepts in the new legislation.

### ARCTIC WATERS POLLUTION PREVENTION ACT

The *Arctic Waters Pollution Prevention Act* is a federal statute that was enacted in 1985 and applies to applies to the arctic waters, defined as the internal waters of Canada and the waters of the territorial sea of Canada and the exclusive economic zone of Canada, within the area enclosed by the 60th parallel of north latitude, the 141<sup>st</sup> meridian of west longitude and the outer limit of the exclusive economic zone.<sup>241</sup>

This Act is intended to prevent pollution of waters adjacent to the mainland and islands of the Canadian Arctic. The Act recognizes the potential threats posed to the delicate balance of marine and coastal biological diversity of the Canadian Arctic by exploitation and shipment of Arctic natural resources.<sup>242</sup> It addresses deposits of waste, shipping, regulates works and the establishment of Shipping Safety Control Zones.

While this Act may have a general positive impact on blue carbon ecosystems, it does not do so in a targeted way.

### 4.3 FEDERAL CONSERVATION LAWS & REGULATIONS

For better or worse over the course of its history, Canada has periodically looked northward to achieve both its development and its conservation objectives. A quick look at a map of the National Parks System (Figure 4) shows the north concentration of the landmass dedicated to National Parks in Canada’s North:

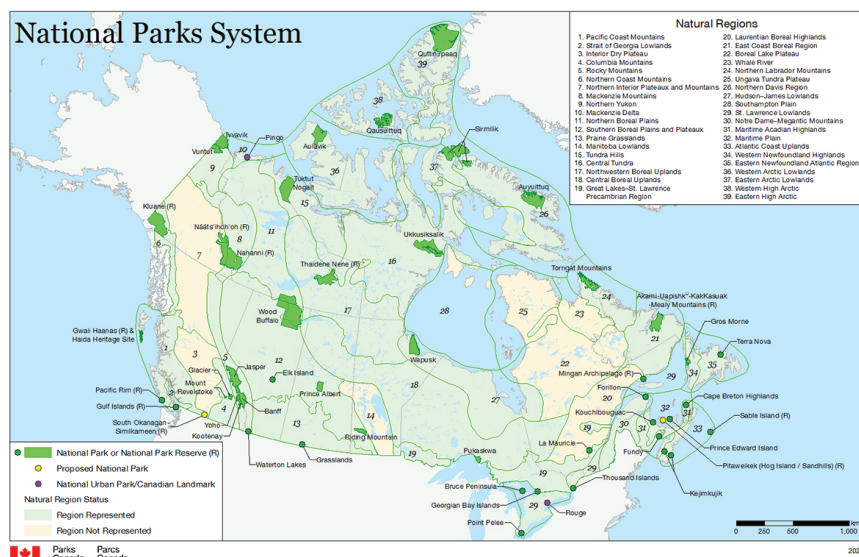


Figure 4. Map of Canadian National Parks System.<sup>243</sup>

240. Fisheries and Oceans Canada, “On the path to reconciliation”, (accessed online: <https://www.dfo-mpo.gc.ca/aquaculture/act-loi/reconciliation-eng.html>, November 22, 2022).

241. *Arctic Waters Pollution Prevention Act*, R.S.C., 1985, c. A-12.

242. *Major Initiatives on Biodiversity*, p. 146-147.

243. Parks Canada, *Map of Completing the Parks System*, (accessed online: <https://parks.canada.ca/pn-np/cnnp-cnnp/carte-map>, November 22, 2022).

Prior to the mid-1970's in Inuit Nunangat, legislative and policy initiatives supporting these objectives were largely pursued unilaterally and not in consultation with Inuit. Since the conclusion of the five Inuit-Crown treaties, these processes have been subject to the terms of those treaties and, as a consequence, have been somewhat more cooperative. While Treaty 9 and Treaty 5 in northern Ontario and Manitoba are historical treaties and do not contain the same subject matters and level of detail, these also require nation-to-nation dialogue and consultation when it comes to questions of land use and land use limitations.

This treaty context, which underlies, is integrated with, and sometimes contrasts with federal conservation legislation and policy, will be discussed in detail in the Phase 2 Discussion Paper, if approved. For now, it is helpful to be aware that there are colonial legacies as well as instances of reconciliation interwoven in the federal legislation and policy that aims to protect specific species and broader ecosystems.

### **CANADA NATIONAL MARINE CONSERVATION AREAS ACT<sup>244</sup>**

The *Canada National Marine Conservation Areas Act* was enacted in 2002 and is based on a 1994 policy on National Marine Conservation Areas. This Act and the underlying policy currently seem to be in a state of renewal. Parks Canada indicates that it is updating the 1994 and is in the process of developing general regulations to accompany the Act.<sup>245</sup> It is unclear how active these initiatives are.

The NMCA Act authorizes the establishment of National Marine Conservation Areas by order of the Governor in Council. The Governor in Council possesses this authority with respect to submerged lands and waters within the internal waters, territorial sea or exclusive economic zone of Canada and any coastal lands or islands within Canada to which the federal Crown has title. The federal Crown may also establish an NMCA in other lands upon agreement with the title holder. Once established, NMCAs are to be listed in Schedule 1 of the Act.

Protection is extended through administration, planning, regulation and a series of prohibitions. Pursuant to section 8, the Minister is responsible for the administration of an NMCA.<sup>246</sup> Pursuant to section 9, the Minister must prepare a Management plan upon consultation with provincial, territorial and Indigenous governing bodies and other stakeholders within five years of establishment. This Management Plan must include a long-term ecological vision for the marine conservation area and provision for ecosystem protection, human use, zoning, public awareness and performance evaluation, and must be tabled in each House of Parliament.<sup>247</sup> While the Governor in Council has authority to make regulations for the management and protection of ecosystems within an NMCA,<sup>248</sup> as noted above, none have been promulgated to date. Once an NMCA is established, and NMCA cannot be occupied, explored, exploited or used for depositing waste.

While there are currently no NMCAs listed in Schedule 1 and only one NMCA Reserve listed in Schedule 2,<sup>249</sup> Parks Canada indicates that there are “currently 5 NMCAs in Canada”. Relevant to this Discussion Paper, the Tallurutiup Imanga NMCA is 108,000 square kilometres in area and is located in Lancaster Sound, Nunavut. As a condition precedent to its establishment, in accordance with the Nunavut Agreement, an Inuit Impact and Benefit Agreement has been negotiated with Nunavut Inuit. Due to its location in the high arctic, the impact of this NMCA for blue carbon ecosystem protection may be minimal. However, the process completed does provide a helpful guide for establishment of these protected areas elsewhere in Inuit Nunangat.

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244. *Canada National Marine Conservation Areas Act*, S.C. 2002, c. 18. [*Canada NMCA Act*]

245. Parks Canada, *National marine conservation areas policy and regulations* (accessed online: <https://parks.canada.ca/amnc-nmca/consultation>, November 22, 2022).

246. *Canada NMCA Act*, s. 8.

247. *Canada NMCA Act*, s. 9.

248. *Canada NMCA Act*, s. 16(1).

249. *Canada NMCA Act*, Schedule 1 and 2.

In 2021, Canada committed to establishing 10 new marine and four new freshwater NMCAs over the following five years.<sup>250</sup> This could be an opportune time to identify blue carbon ecosystems as areas worthy of designation as NMCAs.

### **CANADA NATIONAL PARKS ACT<sup>251</sup>**

While national parks legislation has a long history in Canada dating to the late 19<sup>th</sup> Century, the current rendition of the *Canada National Parks Act* was enacted in 2000. The purpose of Canada's national parks is to benefit, educate and service the enjoyment of the current and future generations. While notably anthropocentric in objective, the Act does have potential for protecting blue carbon ecosystems, particularly in the larger park areas established in the Arctic and northern regions.

The Governor in Council may, by order establish an area as a park as long as the federal Crown has clear title to those lands and the relevant province agrees to the use of those lands for that purpose designed to allow the creation of national parks throughout Canada. In the case of the territories, the federal Crown must consult with the relevant member of the Executive Council before recommending the taking control of lands for the purpose of establishing a national park.<sup>252</sup>

Once established, national parks cannot be occupied and the interest in those lands cannot be disposed of, except as permitted by regulation.<sup>253</sup> The declaration of an area as a "wilderness area" via regulation pursuant to section 14 of the Act provides an added layer of protection.<sup>254</sup> The Governor in Council also has the authority to make regulations spanning a large number of potential protections, e.g., of "flora, soil, waters, fossils, natural features, air quality, and cultural, historical and archaeological resources".<sup>255</sup> While specific regulations relating to climate change mitigation and carbon sequestration are not listed, there is likely enough room within these subsections to protect blue carbon ecosystems.

A number of the National Parks listed in Schedule 1 of the Act abut the arctic coastline beginning at the ordinary low water mark and expanding inland. Through designation and regulation these tidal areas could be subject to specific blue carbon protections.

### **CANADA WILDLIFE ACT<sup>256</sup>**

The current version of the *Canada Wildlife Act* was enacted in 1985 and incorporates periodic amendments passed since then. This Act applies to any animal, plant or other organism belonging to a species that is wild by nature or that is not easily distinguishable from such a species; and, the habitat of any such animal, plant or other organism.<sup>257</sup> Given the disregard wildlife tends to have for political boundaries, the protection and management of wildlife tends to be an inter-jurisdictional affair.

This Act authorizes the Minister, on any public lands assigned to them, carry out conservation measures with respect to wildlife, which do not conflict with provincial laws. This authority extends to marine areas any area of the sea that forms part of the internal waters of Canada, the territorial sea of Canada or the exclusive economic zone of Canada.<sup>258</sup> With respect to wildlife in danger of extinction, the Act authorizes the Minister, working with

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250. Parks Canada, *National marine conservation areas policy and regulations* (accessed online: <https://parks.canada.ca/amnc-nmca/consultation>, November 22, 2022).

251. *Canada National Parks Act*, S.C. 2000, c. 32.

252. *Northwest Territories Act* S.C. 2014, c. 2, s. 55.

253. *Canada National Parks Act*, s. 13.

254. *Canada National Parks Act*, s. 14(1) and (2).

255. *Canada National Parks Act*, s. 16(b).

256. *Canada Wildlife Act*, R.S.C., 1985, c. W-9.

257. *Canada Wildlife Act*, s. 2(4).

258. *Canada Wildlife Act*, s. 4.1(1).



the relevant provinces to take such measures necessary for the protection of such species. The *Wildlife Area Regulations* enabled pursuant to the *Canada Wildlife Act* include helpful prohibitions for those areas identified as “wildlife areas” in Schedule 1 of those regulations. These include, *inter alia*, “introduce any living organism whose presence is likely to result in harm to any wildlife or the degradation of any wildlife residence or wildlife habitat” (this reinforces invasive species legislation above); “disturb or remove any soil, sand, gravel or other material” (i.e. dredge); “carry out any other activity that is likely to disturb, damage, destroy or remove from the wildlife area any wildlife — whether alive or dead — wildlife residence or wildlife habitat”.<sup>259</sup>

Similar to other legislation, a link between a blue carbon ecosystem and habitat for a protected species must be established before protections can be activated.

## **OCEANS ACT**<sup>260</sup>

The *Oceans Act* was enacted in 1996. Canada has been exercising its jurisdiction within its territorial sea (12 nautical miles from its baselines) since 1970 under previous legislation and within the Extended Economic Zone (EEZ, 200 nautical miles from its territorial baselines) since 1977. However, the territorial sea, contiguous zone, internal waters and EEZ were formally declared when the *Oceans Act* came into force in 1997. The formal establishment of this zone is critical as within the EEZ, Canada maintains sovereign rights over exploring, exploiting, conserving and managing living and non-living resources of the water, seabed and subsoil.<sup>261</sup> Through certain key amendments, has become an important tool in the ocean management and marine conservation toolkit and advances the progress made under the *NMCA Act*.

One of the Act’s objectives is to promote the wide application of the precautionary approach to the conservation, management and exploitation of marine resources in order to protect these resources and preserve the marine environment.<sup>262</sup> A facet of achieving this, the *Oceans Act* requires the development and implementation of a national strategy for the management of estuarine, coastal and marine ecosystems in waters that form part of Canada or in which Canada has sovereign rights under international law (see EEZ above).<sup>263</sup> The *Canada’s Oceans Strategy: Our Oceans, Our Future* (2002) identifies, among other things, the development of a national system of Marine Protected Areas (MPAs) alongside NMCA and Marine Wildlife Areas as a long term goal.<sup>264</sup> MPAs are a key avenue for blue carbon ecosystem protection because they apply to marine environments where seaweed grows *and* do not rely on the establishment of a habitat link to another protected species.<sup>265</sup>

An important link can be made between this section and stated political priorities. In his 2021 mandate letter to the Minister of Fisheries, Oceans and the Canadian Coast Guard the Prime Minister instructed:

The science is clear. Canadians have been clear. We must not only continue taking real climate action, we must also move faster and go further. As Canadians are increasingly experiencing across the country, climate change is an existential threat. Building a cleaner, greener future will require a sustained and collaborative effort from all of us. As Minister, I expect you to seek opportunities within your portfolio to support our whole-of-government effort to reduce emissions, create clean jobs and address the climate-related challenges communities are already facing.<sup>266</sup>

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259. *Wildlife Area Regulations*, CRC, c. 1609, ss. 3(1).

260. *Oceans Act*, S.C. 1996, c. 31.

261. *United Nations Convention on the Law of the Sea*, Dec. 10, 1982, 1833 U.N.T.S. 397, art. 56(1)

262. *Oceans Act*, Preamble.

263. *Oceans Act*, 29.

264. *Canada’s Oceans Strategy: Our Oceans, Our Future* (2002) (accessed online: <https://waves-vagues.dfo-mpo.gc.ca/library-biblio-theque/264678.pdf>, November 22, 2022).

265. *Oceans Act*, s. 35(1)(d) and (e).

266. Office of the Prime Minister of Canada, *Minister of Fisheries, Oceans and the Canadian Coast Guard Mandate Letter*, (accessed online: <https://pm.gc.ca/en/mandate-letters/2021/12/16/minister-fisheries-oceans-and-canadian-coast-guard-mandate-letter>).

If blue carbon is characterised as a marine resource, then an argument can be made that authority lies for the Governor in Council to establish an MPA under section 35(3)(a) on the basis of its protection pursuant to the reason set out under section 35(1)(e).

### **CANADIAN NAVIGABLE WATERS ACT<sup>267</sup>**

The *Canadian Navigable Waters Act* was amended on June 21, 2019 as part of the suite of enactments and amendments proposed in Bill C-69 for the purpose of strengthening environmental protection in Canada.

The CNWA prohibits construction, placement, alteration, rebuilding, removal or decommissioning of work in, on, over, under, through or across any navigable water.<sup>268</sup> To gain permission to conduct work that may affect navigable waters, an owner must apply for approval in the prescribed form.<sup>269</sup> The Minister is also authorized to designate works as “minor,” which can exempt those works from the general prohibition.<sup>270</sup> The Minister of Transport is responsible for the CNWA.

Work includes “any structure, device or other thing, whether temporary or permanent, that is made by humans, including a structure, device or other thing used for the repair or maintenance of another work; and any dumping of fill in any navigable water, or any excavation or dredging of materials from the bed of any navigable water”.<sup>271</sup> Navigable water means a body of water [...] that is used or where there is a reasonable likelihood that it will be used by vessels, in full or in part, for any part of the year as a means of transport or travel for commercial or recreational purposes, or as a means of transport or travel for Indigenous peoples of Canada exercising rights recognized and affirmed by section 35 of the Constitution Act, 1982, and [where], there is public access, by land or by water; there is no such public access but there are two or more riparian owners; or Her Majesty in right of Canada or a province is the only riparian owner”.<sup>272</sup> Decision makers must consider any adverse effects that their decision may have on the rights of Indigenous peoples.

The Schedule to the CNWA lists those bodies of water that are considered “navigable waters”. These include the Arctic Ocean, which is defined to include those waters from the outer limit of the territorial sea to the high water mean tide level. The Schedule also includes major waterways that ultimately flow into the Arctic Ocean, including the Yukon, Mackenzie, Arctic Red, Anderson, Horton, Churchill, Thelon, Kazan and Hayes Rivers.<sup>273</sup>

While the focus of this Act is the protection of the navigability of waters, neither it nor Canada’s associated policy statements deny that there are positive externalities that may accrue from the protection of navigable waters. This is another tool in the protection of riparian and marine zones where arctic blue carbon ecosystems persist.

### **SPECIES AT RISK ACT<sup>274</sup>**

The *Species at Risk Act* was enacted in 2002 to support Canada’s efforts to meet its obligations under the International Convention on Biodiversity. SARA applies to species across Canada and to habitat on federal lands, throughout the EEZ and on the continental shelf. This is a wide net that encompasses Inuit Nunangat and James Bay and Hudson Bay.

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267. *Canadian Navigable Waters Act*, R.S.C., 1985, c. N-22. [CNWA]

268. CNWA, s. 3.

269. CNWA, s. 4.1.

270. CNWA 28(2)(a).

271. CNWA, s. 2.

272. CNWA, s. 2.

273. CNWA, Schedule, Part 1 and Part 2.

274. *Species at Risk Act* S.C. 2002, c. 29. [SARA]

Specifically, the purposes of this Act are to prevent wildlife species from being extirpated or becoming extinct, 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.<sup>275</sup> SARA defines wildlife species as a “species, subspecies, variety or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature [...]”.<sup>276</sup>

If a plant in a blue carbon ecosystem is listed in the Schedule, it is granted the protections under the Act directly rather than merely through its role as habitat provider. Such protections include the prohibition that “no person shall kill, harm, harass, capture or take an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species”.<sup>277</sup> Further, if a wildlife species is listed as an extirpated species, an endangered species or a threatened species, the competent minister must prepare a strategy for its recovery.<sup>278</sup>

Critical habitat that belongs to any listed endangered or threatened species is also protected from destruction under SARA. However, habitat (that it not itself a listed species) is only protected where it is on federal lands, within the EEZ or on the continental shelf; where the species is listed as aquatic (whether or not it spans federal-territorial-provincial boundaries) or where it is a migratory bird sanctuary.<sup>279</sup> Drafted this way, this provision helps “unitize” blue carbon resources across jurisdictional divides, to borrow a concept from the oil and gas sector.

### **MIGRATORY BIRD CONVENTION ACT<sup>280</sup> AND SANCTUARY REGULATIONS<sup>281</sup>**

The *Migratory Bird Convention Act* was enacted in 1994 to implement Canada’s obligations under the *Convention for the Protection of Migratory Birds in the United States and Canada*. The Act applies in Canada and in the EEZ of Canada.<sup>282</sup>

The Act contains a few prohibitions against depositing harmful substances in waters or an area frequented by migratory birds or in a place from which the substance may enter such waters or such an area.<sup>283</sup> The Act authorizes the Governor in Council to make any regulations that the Governor in Council considers necessary to carry out the purposes and provisions of the Act and the Convention.<sup>284</sup> This includes prescribing protection areas for migratory birds and nests, and for the control and management of those areas.<sup>285</sup>

The *Migratory Bird Sanctuary Regulations* were promulgated pursuant the *MBCA*. These Regulations state that “No person shall, in a migratory bird sanctuary, carry on any activity that is harmful to migratory birds or the eggs, nests or habitat of migratory birds, except under authority of a permit”.<sup>286</sup> Migratory Bird Sanctuaries are numerous across Inuit Nunangat, Hudson and James Bays. As will be seen in the review of territorial and provincial jurisdictions below, MBS offer a potential model for protection of blue carbon-as-habitat in intertidal and interjurisdictional areas in the Arctic.

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275. SARA at s. 6.

276. SARA at s. 2.

277. SARA at s. 24.

278. SARA at s. 37(1)

279. SARA at s. 58.

280. Migratory Birds Convention Act, 1994, S.C. 1994, c. 22. [MBCA]

281. Migratory Bird Sanctuary Regulations C.R.C., c. 1036; Migratory Birds Regulations, 2022 (SOR/2022-105) [MBCR]

282. MBCA, s. 2.1.

283. MBCA, s. 5(1).

284. MBCA, s. 12(1).

285. MBCA, s. 12(1)(j).

286. MBCR, s. 10(1).

## 4.4 FEDERAL POLICY MEASURES WITH POTENTIAL RELEVANCE FOR BLUE CARBON INITIATIVES

### BLUE CARBON IN CANADA: A FEDERAL POLICY REVIEW

Following the submission of our draft outline for this Discussion Paper, we had the opportunity to review WWF-Canada's excellent piece entitled *Blue Carbon in Canada: A Federal Policy Review*.<sup>287</sup> This work more than ably covers the subject matter we proposed for this section. As a quick reference to assist the reader, the WWF-Canada Policy Review covers the following extensive cross-section of documents:

#### 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
- 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

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287. 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. [WWF-Canada Policy Review]

- 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
- 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

There are only a few additional federal-level documents that may be considered in addition to this robust list. These follow briefly here.

### **INUIT NUNANGAT DECLARATION, INUIT NUNANGAT POLICY AND INUIT-CROWN GUIDANCE**

The federal Crown, Inuit Tapiriit Kanatami (ITK), Inuvialuit Regional Corporation (IRC), Makivik Corporation, Nunatsiavut Government (NG), and Nunavut Tunngavik Incorporated (NTI) signed the *Inuit Nunangat Declaration* (IND) on February 9, 2017.<sup>288</sup> The IND establishes the Inuit Crown Partnership Committee, the mandate of which includes working collaboratively to identify and take action on shared priorities. While not immediately relevant to blue carbon sequestration, the Declaration created the space for jointly developing policies, strategies and guidance in a range of spaces, including the marine environment.

Created within this space, the *Inuit Nunangat Policy* (INP) "applies to all federal departments and agencies, guiding them in the design, development and delivery of all new or renewed federal policies, programs, services, and initiatives that apply in Inuit Nunangat and/or benefit Inuit, including programs of general application, and

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<sup>288</sup>. *Inuit Nunangat Declaration on Inuit-Crown Partnership*, signed February 9, 2017 at Iqaluit, Nunavut.



to support Inuit self-determination”.<sup>289</sup> As this is the paradigm that now guides federal policy initiatives that apply across Inuit Nunangat, it will be essential to understand the direction emerging from the Inuit-Crown Partnership Committee when developing strategies to impact federal policy in this region. Two parts of the INP are of particular relevance to work regarding blue carbon ecosystems:

5.1 Considerations relating specifically to Inuit Nunangat need to be reflected in the development of federal policies and programs, including those of general application, so that Inuit are not inadvertently excluded or disadvantaged. To recognize and account for the unique situation of Inuit Nunangat, Canada will take an Inuit Nunangat approach in the design and renewal of all federal policies, programs, services, and initiatives that apply in Inuit Nunangat and/or are intended to benefit Inuit, including those who reside outside Inuit Nunangat.<sup>290</sup>

[...]

Research conducted in Inuit Nunangat and pertaining to Inuit is pivotal for supporting evidence-based policy development and decision-making. Geopolitical, cultural, socioeconomic, industrial, and climate challenges throughout Inuit Nunangat require innovative solutions informed by Inuit Qaujimajatuqangit and research developed in partnership with Inuit. Supporting Inuit self-determination in research is necessary to improve its efficacy, pertinence and acceptability across Inuit Nunangat.<sup>291</sup>

The ICPC is constantly working on guidance for Inuit and federal partners. One recent example are the *Inuit-Crown Co-development Principles*<sup>292</sup> endorsed by the ICPC in December 2022. These provide more specific direction as to how federal laws and policies that address, for example, protection and conservation of arctic ecosystems will be approached going forward.

The important takeaways are twofold: First, for any initiative relating to blue carbon ecosystems in Inuit Nunangat, Inuit will be directing minds and equal participants in that process. Second, it will be important to keep an eye open for further guidance documents and strategies from the ICPC in the coming years, particularly regarding environment and climate change.

## **GOVERNMENT OF CANADA GUIDANCE FOR RECOGNIZING MARINE OTHER EFFECTIVE AREA-BASED CONSERVATION MEASURES (2022)**<sup>293</sup>

Another recent policy document that may have relevance for the blue carbon discussion is the 2022 OECM Guidance. This updates the Operational Guidance for Identifying ‘Other Effective Area-Based Conservation Measures’ in Canada’s Marine Environment (2017).<sup>294</sup> This guidance is relevant insofar as Canada works to maintain – and perhaps improve – its conservation commitments pursuant to the Targets endorsed in the *Strategic Plan for Biodiversity, including the Aichi Biodiversity Targets, for the 2011-2020 period*.<sup>295</sup> In order to

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289. *Inuit Nunangat Policy*, 2021, (accessed online: <https://www.rcaanc-cirnac.gc.ca/eng/1650556354784/1650556491509>, November 22, 2022). [INP]

290. INP, s. 5.1

291. INP, Guidance for specific program and policy areas, s. 1.

292. *Inuit-Crown Co-development Principles*, 2022, (accessed online: <https://www.itk.ca/wp-content/uploads/2022/11/ICPC-Co-Development-Principles.pdf>, November 22, 2022).

293. DFO, *Guidance for Recognizing Marine Other Effective Area-Based Conservation Measures* (2022) Fisheries and Oceans Canada, <https://www.dfo-mpo.gc.ca/oceans/publications/oecm-amcepz/oecm-guidance-directives-amcez-2022-eng.pdf>. [2022 OECM Guidance]

294. Government of Canada, *Operational Guidance for Identifying ‘Other Effective Area-Based Conservation Measures’ in Canada’s Marine Environment* (2017) Minister of Fisheries and Oceans Canada (accessed online: <https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/4069060x.pdf>). [2017 OECM Guidance] (accessed online: <https://www.dfo-mpo.gc.ca/oceans/publications/oecm-amcepz/index-eng.html>).

295. Conference of the Parties to the Convention on Biological Diversity, *10 Decision X/2: The Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets*, UNEP/CBD/COP/DEC/X/2. [Aichi Targets]

satisfy its commitments, Canada must be able to verify that it has met the standards set by the *Convention on Biodiversity* (CBD) community, hence the 2017 and 2022 OECM Guidance.

Briefly for context, consistent with its obligations under Articles 5 and 6 of the CBD and in response to the Conference of the Parties-endorsed *Aichi Targets*, the Government of Canada along with provincial and territorial governments released the *2020 Biodiversity Goals and Targets for Canada* in 2015. This document contains 4 goals and 19 targets, which build on the Canadian Biodiversity Strategy and Canada's Biodiversity Outcomes Framework and guide the federation's work in contributing to the 2011-2020 Strategic Plan. The following goal and target are particularly relevant to protections of blue carbon ecosystems:

**Goal A:** By 2020, Canada's lands and waters are planned and managed using an ecosystem approach to support biodiversity conservation outcomes at local, regional and national scales.

**Target 1:** By 2020, at least 17 percent of terrestrial areas and inland water, and 10 percent of coastal and marine areas, are conserved through networks of protected areas and other effective area-based conservation measures.<sup>296</sup>

A marine OECM is a policy-based status granted to an area-based measure established in law by an appropriate jurisdiction in the Pacific, Arctic, or Atlantic ocean, that meets certain science-based criteria and applies declared principles.<sup>297</sup> Complementing MPAs established pursuant to the *Oceans Act* discussed above, "OECMs add to the marine conservation toolkit" as they provide biodiversity conservation benefits "regardless of the primary objective for which the area-based measure was initially established".<sup>298</sup> As the 2022 OECM Guidance notes, "OECMs may be used to protect areas important for carbon sequestration and provide other adaptation and mitigation benefits as part of a nature-based solution to climate-change impacts".<sup>299</sup> [Emphasis added]

Significantly, the 2022 OECM Guidance notes that an important habitat is one that has biodiversity conservation value.<sup>300</sup> Support for climate change adaptation and mitigation, including carbon sequestration is recognized as a biodiversity conservation benefit. Blue carbon ecosystems could satisfy the "benefit for an important habitat" criterion.

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296. Biodivcanada, 2020 Biodiversity Goals and Targets for Canada – Target 1, online: <<https://biodivcanada.chm-cbd.net/canada-target-1>>.

297. 2017 OECM Operational Guidance, p. 3.

298. 2022 OECM Guidance, p. 3.

299. 2022 OECM Guidance, p. 3.

300. 2022 OECM Guidance, p. 32.

# PART 5: YUKON LAWS & POLICIES

This section queries the legislative and policy tools specific to the Yukon that may relate to the protection and/or restoration Arctic coastal blue carbon ecosystems found there. This Part includes territorial source law and policy as well as federal laws that apply uniquely to this territory.

As with all of the Parts of this Discussion Paper, this length of coastline is subject to underlying Indigenous rights. The *Inuvialuit Final Agreement*<sup>301</sup> (IFA) was ratified in 1984 and incorporated into Canadian law through the *Western Arctic (Inuvialuit) Claims Settlement Act*.<sup>302</sup> The governance and regulatory structures under the IFA will be analysed in greater detail in Phase 2 of the Discussion Paper. For the purposes of Phase 1, it is simply important to understand that the part of the Inuvialuit Settlement Region known as the Yukon North Slope has been of particular significance to Inuvialuit since time immemorial and is subject to a special conservation and regulatory regime under the IFA.

Also similar to other Parts of this Discussion Paper, it is important to acknowledge that as a territory, Yukon is on different legal footing than the provincial jurisdictions reviewed in the WECLAW and ECELAW Discussion Papers. While Yukon is a creature of federal statute with powers delegated to it by federal Parliament rather than the *Constitution Act, 1867*, devolution over time has resulted in the territory exercising administration and control in ways similar to provinces. As the purpose of this Discussion Paper is to bring existing legislation and policy that is relevant to blue carbon ecosystems to the fore, this will remain the focus.

A final organizing note, an effort has been made in this Discussion Paper to show every potentially relevant statute and policy document so that as this dialogue is continued, this work does not need to be redone. While the documents listed here have been reviewed in the hopes of finding blue carbon sequestration protections or *potential* protections, some of these just do not have much to recommend. In those cases, this Discussion Paper will indicate: “No references were found to Key Blue Carbon Concepts”. These include: plants, seaweed, algae, eelgrass, habitat, wetlands, marsh, mudflats, tidal, nearshore, climate, carbon, sequestration, dredging, etc.

## 5.1 YUKON STATUTES AND REGULATIONS

### ***YUKON NORTHERN AFFAIRS PROGRAM DEVOLUTION TRANSFER AGREEMENT, 2001***<sup>303</sup>

Territorial devolution processes are influenced by many factors and result in a multiplicity of regulatory and governance approaches to lands, resources and the environment. A quick note on the status of devolution in Yukon may be helpful in understanding how it fits among the northern jurisdictions.

Prior to Yukon devolution, the Government of Canada, through the Department of Aboriginal Affairs and Northern Development, governed most natural resources in the territory.<sup>304</sup> However, Yukoners pushed for greater independence and set about negotiating the *Yukon Northern Affairs Program Devolution Transfer Agreement*. The Yukon Devolution Agreement was signed on October 29, 2001.<sup>305</sup> It addresses a range of issues include transfer of responsibilities relating to lands, waters, surface rights, mining, forest resources,

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301. *Inuvialuit Final Agreement* (1984), as amended.

302. *Western Arctic (Inuvialuit) Claims Settlement Act*, S.C. 1984, c. 24.

303. Yukon Northern Affairs Program Devolution Transfer Agreement, October 29, 2001, (accessed online: [https://www.rcaanc-cirnac.gc.ca/DAM/DAM-CIRNAC-RCAANC/DAM-NTHAFF/STAGING/texte-text/nth\\_pubs\\_yna\\_yna\\_1316538556192\\_eng.pdf](https://www.rcaanc-cirnac.gc.ca/DAM/DAM-CIRNAC-RCAANC/DAM-NTHAFF/STAGING/texte-text/nth_pubs_yna_yna_1316538556192_eng.pdf), November 22, 2022). [Yukon Devolution Agreement]

304. Government of Canada, *Yukon Devolution* (accessed online: <https://www.rcaanc-cirnac.gc.ca/eng/1352470994098/1535467403471>, November 22, 2022).

305. *Yukon Northern Affairs Program Devolution Transfer Agreement* (2001).

environmental matters, territorial financing, etc.<sup>306</sup> On April 1, 2003, amendments to the Yukon Act, based on the Yukon Devolution Agreement came into effect.

### **YUKON ACT (CANADA)<sup>307</sup>**

The *Yukon Act* is a federal statute, which replaced its predecessor legislation in 2002 in order to implement provisions of the *Yukon Northern Affairs Program Devolution Transfer Agreement*. The Yukon Act sets out, among other things, the structure of the Yukon Government and law-making powers of the Legislature.

Most relevant to blue carbon ecosystems, the Yukon Legislature may make laws in relation to the conservation of wildlife and its habitat, other than in a federal conservation area; waters, other than waters in a federal conservation area, including the deposit of waste in those waters. The Legislature may also make laws in respect of oil and gas in the adjoining area.<sup>308</sup> Specifically, the Legislature may make laws relating to exploration and development of non-renewable resources in and export from the adjoining area.<sup>309</sup>

Three definitions are important for understanding the jurisdictional dynamic here. First, waters means “any inland water, whether in a liquid or frozen state, on or below the surface of land”.<sup>310</sup> Subject to the Act, the Commissioner has the administration and control of all rights in respect of waters in Yukon — other than waters in a federal conservation area.<sup>311</sup> Third, “Yukon North Slope” means all those lands within the geographic limits of the Yukon Territory north of the height of land dividing the watersheds of the Porcupine River and the Beaufort Sea, and includes islands within twenty statute miles from the shores of the Beaufort Sea.<sup>312</sup> Limiting the scope of this territorial authority in terms of blue carbon initiatives, Ivvavik National Park, which constitutes a federal conservation area under the *Yukon Act*, encompasses the western half of the Yukon coastline. Further Canada maintains a reactive authority with respect to waters anywhere in Yukon through a prohibition order mechanism:

Governor in Council, on the recommendation of the Minister, may by order prohibit any use of waters in Yukon specified in the order, or the deposit of waste directly or indirectly into those waters, if the Governor in Council considers

(a) that the use, or the deposit of waste, would be incompatible with or would interfere with a particular undertaking that is in the national interest; or

(b) that the prohibition is required for the settlement of an aboriginal land claim or the implementation of an aboriginal land claim agreement.<sup>313</sup> [Emphasis added]

Second, the adjoining area, defined in Schedule 2 of the *Yukon Act*, encompasses the marine space within the low water mark points on protruding aspects of land (i.e. extremities of coastal indentations).<sup>314</sup> In relation to this area of jurisdiction as well, Canada retains the authority to prohibit certain activities in support of, inter alia, environmental priorities:

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306. Yukon Devolution Agreement, s. 2.1.

307. *Yukon Act*, S.C. 2002, c. 7.

308. *Yukon Act*, s. 18.

309. *Yukon Act*, s. 19.

310. *Yukon Act*, s. 2.

311. *Yukon Act*, s. 48(2) – (4).

312. *Yukon Wildlife Act*, s. 1. Please note: this section does not delve into Hunters and Trappers Committee Bylaws, Co-management body authorities or recommendations flowing from authorities established under the IFA. This provides a territorial and federal government-centric perspective of wildlife, which is incomplete. Those modern treaty aspects will be discussed in Phase 2 of this Discussion Paper.]

313. *Yukon Act*, s. 51.

314. *Yukon Act*, Schedule 2.

The Governor in Council, on the recommendation of the Minister, may by order prohibit the issuance under this Act of interests in, or the authorization under this Act of the conduct of activities on, lands in the adjoining area specified in the order, if the Governor in Council considers that the existence of the interests or the conduct of the activities would be incompatible with or would interfere with

- (a) any use to which the Government of Canada intends the lands to be put, including, in particular, their use as a national park or an airport or their use for purposes of national defence or navigation;
- (b) the exercise, in relation to those lands, of any powers of the Government of Canada, including, in particular, powers respecting national security or the protection of the environment; or
- (c) the settlement of an aboriginal land claim or the implementation of an aboriginal land claim agreement. [Emphasis added]

Initiatives regarding blue carbon ecosystems in Yukon will necessarily be a cooperative effort between the federal, territorial and Inuit governing organizations at minimum.

### **YUKON TERRITORY FISHERY REGULATIONS (CANADA)<sup>315</sup>**

The *Yukon Territory Fishery Regulations* are federal regulations enabled pursuant to the *Fisheries Act*. These Regulations apply in respect of fishing in the Canadian fisheries waters off the Yukon Territory and in the waters of the Yukon Territory other than the waters of a National Park of Canada located in that Territory.<sup>316</sup>

The regulations subject fishing to the conditions listed in the Regulations: “no person shall fish, engage in fish farming or hold a derby except under the authority of a licence issued under these Regulations, the Fishery (General) Regulations or the Aboriginal Communal Fishing Licences Regulations”.<sup>317</sup> Section 5.1 provides a carve out for an Inuvialuit Subsistence Fishery within the Inuvialuit Settlement Region, which covers the North Slope region.<sup>318</sup>

Beyond the forgoing, these Regulations contain no references Key Blue Carbon Concepts.

### **YUKON WATERS ACT<sup>319</sup> AND WATERS REGULATION<sup>320</sup>**

The Yukon Waters Act is a territorial statute enacted in 2003 as part of the mirror legislation following the Yukon Devolution Agreement.

This Act assigns administration and control of waters in Yukon outside of federal lands to the Commissioner.<sup>321</sup> The term waters is defined to include any inland water, whether in a liquid or frozen state, on or below the surface of the land. This does not include marine areas below the low water mark, including the adjoining area.<sup>322</sup> The area of jurisdiction that may overlap with blue carbon ecosystems is somewhat narrow, therefore. It

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315. *Yukon Territory Fishery Regulations*, C.R.C., c. 854. [*Yukon Fishery Regulations*]

316. *Yukon Fishery Regulations*, s. 3(1).

317. *Yukon Fishery Regulations*, s. 4(1).

318. *Yukon Fishery Regulations*, s. 5.1.

319. *Yukon Waters Act*, RSY 2003, c. 19.

320. *Yukon Waters Regulation* O.I.C. 2003/58

321. *Yukon Waters Act*, s. 3.

322. *Yukon Waters Act*, s. 1.

would include the tidal area between the low water mark and the end of the blue carbon terrestrial range in the eastern half of the North Slope.

Under the Act, the Yukon Water Board is authorized to issue Class A and Class B licenses and subject those licenses to conditions. These conditions include manner of use, quantity used, waste disposal, research and monitoring.<sup>323</sup> The Commissioner in Executive Council may also establish water management areas and prescribe special conditions in those areas by regulation.<sup>324</sup>

The Waters Regulations apply to water management areas. Under the Regulations, all waters and river basins of the mainland draining into the Beaufort Sea or into the Mackenzie River, and Herschel Island are established as a Water Management Area. In this area person may use water or deposit waste without a licence only if the proposed use or deposit (a) has no potential for significant adverse environmental effects; (b) would not interfere with existing rights of other water users or waste depositors; and (c) satisfies the criteria set out in the schedules with respect to industrial undertakings.<sup>325</sup>

While the Act and Regulations provide for careful treatment of drainages into the Beaufort Sea, where blue carbon ecosystems occur, the protections afforded are general in nature and do not require specific evaluation of blue carbon impacts.

### **YUKON ENVIRONMENT ACT<sup>326</sup>**

The *Yukon Environment Act* is a territorial statute enacted in 2002 as part of the mirror legislation following the Yukon Devolution Agreement. Subject to the *Yukon Act* (Canada) and any land claim agreement, this Act applies throughout the Yukon.<sup>327</sup> This Act includes high-level protections that could be drawn upon for blue carbon ecosystem protection initiatives.

Key definitions in this Act, “adverse effect” means actual or likely (a) impairment of the quality of the environment; (b) damage to property or loss of enjoyment of the lawful use of property; (c) damage to plant or animal life or to any component of the environment necessary to sustain plant or animal life; (d) harm or material discomfort to any person. “Land” includes the surface, topsoil, and over burden of land and wetlands. And, “public trust” means the collective interest of the people of the Yukon in the quality of the natural environment and the protection of the natural environment for the benefit of present and future generations.<sup>328</sup>

The YEA establishes that the people of the Yukon have the right to a healthful natural environment<sup>329</sup> and assigns every adult or corporate person resident in the Yukon a right of action where they have reasonable grounds to believe environmental impairment has occurred or is imminent or where the YG has failed to meet its responsibilities as trustee of the public trust to protect the natural environment.<sup>330</sup> The YEA also requires the incorporation of the environment into government decision-making,<sup>331</sup> and the preparation of a Yukon Conservation Strategy “(a) to provide a comprehensive long-term guide for the policies and practices of the Government of the Yukon in relation to the environment; and (b) to set out the commitments and recommendations of the Government of the Yukon with respect to conservation of the environment and sustainable development.”<sup>332</sup>

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323. *Yukon Waters Act*, s. 13.

324. *Yukon Waters Act*, s. 31.

325. *Yukon Waters Regulation*, s. 4.

326. *Yukon Environment Act*, RSY 2002, c. 76.

327. *Yukon Environment Act*, s. 3.

328. *Yukon Environment Act*, s. 2.

329. *Yukon Environment Act*, s. 6.

330. *Yukon Environment Act*, s. 8.

331. *Yukon Environment Act*, s. 39.

332. *Yukon Environment Act*, s. 44.



The YEA further authorizes the Commissioner in Executive Council to establish land use plans,<sup>333</sup> water management plans,<sup>334</sup> wilderness management plans and areas,<sup>335</sup> and conservation easements<sup>336</sup> in consultation with rights holders and other stakeholders. No land use or water management plan has been established for the Yukon North Slope, though such plans have been established for other parts of Yukon.<sup>337</sup> This Act does not otherwise target any Key Blue Carbon Concepts.

### **PARKS AND LAND CERTAINTY ACT<sup>338</sup>**

The *Yukon Parks and Land Certainty Act* is a territorial statute enacted in 2002 as part of the mirror legislation following the Yukon Devolution Agreement. The YPLC Act applies throughout Yukon subject to the *Yukon Act* and modern treaties.

The purpose of the Act is to establish parks to implement obligations under settlement agreements and to provide for the protection and management of representative areas of territorial significance and other special places in the Yukon.<sup>339</sup> The Commissioner in Executive Council may, by order establish parks in furtherance of the purpose of this Act.<sup>340</sup> A Yukon Territorial Park may be classified as, among others, an ecological reserve (established to protect an area of unique natural significance), a natural environment park (established to protect a representative or unique landscape that displays ecological characteristics or features of one or more of the Yukon's ecoregions) or a wilderness preserve (established with a view to protecting an ecological unit or representative core area by conserving biodiversity and ecological viability).<sup>341</sup> Herschel Island Territorial Park was established as a natural environment park pursuant to Schedule 2 of the Act and in satisfaction of negotiated terms of the IFA.<sup>342</sup> The special protections extended in this park are discussed below.

Industrial development in an ecological reserve or a wilderness preserve is prohibited.<sup>343</sup> Subject to regulations it is prohibited to remove, destroy, damage, disturb or exploit a natural resource in a park.<sup>344</sup> Further, the Commissioner in Executive Council may make regulations regulating or prohibiting any *activity* in a park in accordance with an approved management plan.

Like the *National Parks Act* discussed above, this act provides protection tools that could be applied to blue carbon ecosystems. Blue carbon ecosystems could fit within any of the three categories of parks listed above. Further the Commissioner in Executive Council's regulation-making authority is broad and could provide robust protections at least to the low water mark line on the coast of the Beaufort Sea.

### **HERSCHEL ISLAND PARK REGULATIONS<sup>345</sup>**

Qikiqtaruk Territorial Park is designated a Natural Environment Park under the *Yukon Parks and Lands Certainty Act* (please see previous section).

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333. *Yukon Environment Act*, s. 69.

334. *Yukon Environment Act*, s. 70.

335. *Yukon Environment Act*, s. 74.

336. *Yukon Environment Act*, s. 76.

337. E.g. <https://yukon.ca/en/wildlife-habitat-planning#special-management-area-and-habitat-protection-area-management-plans> and <https://yukon.ca/en/science-and-natural-resources/landscape-and-ecology/learn-about-regional-land-use-planning>.

338. *Parks and Land Certainty Act*, RSY 2002, c. 165. [YPLC Act]

339. *Parks and Land Certainty Act*, s. 1.

340. *Parks and Land Certainty Act*, s. 6.

341. *Parks and Land Certainty Act*, s. 11.

342. *Parks and Land Certainty Act*, Schedule, s. 2.

343. *Parks and Land Certainty Act*, s. 32.

344. *Parks and Land Certainty Act*, s. 60.

345. *Herschel Island Park Regulations*, O.I.C. 1990/038.

The IFA defines the boundaries of Herschel Island - Qikiqtaruk Territorial Park and sets out conditions for planning and management. The IFA states that the Park will have the following management objectives:

- to protect the wilderness characteristics of the area, maintaining its present undeveloped state to the greatest extent possible;<sup>346</sup>
- to protect the existing historical, cultural, archaeological and palaeontological resources adjacent to Pauline Cove;<sup>347</sup>
- to protect and manage the wildlife populations and the wildlife habitat within the area;<sup>348</sup>
- to provide the Inuvialuit with the opportunity to use the area in support of their traditional lifestyles, while providing any economic opportunities arising out of the operations and management of the Park to the Inuvialuit on a preferred basis.<sup>349</sup>

In this Park, it is prohibited to remove, damage, or destroy flora, fauna, or other natural objects in the park except under the authority of a park use permit.<sup>350</sup> Further, Qikiqtaruk Territorial Park is subject to the 2019 Herschel Island- Qikiqtaruk Territorial Park Management Plan.<sup>351</sup> The Management Plan was prepared over five years with major consultation and input from governing bodies under the IFA including the Inuvialuit Game Council, the Aklavik Hunters and Trappers Committee, the Aklavik Community Corporation, and the Wildlife Management Advisory Council (North Slope).<sup>352</sup> The Plan does not specifically reference any Key Blue Carbon Concepts.

Again, these territorial regulations provide fairly broad protections benefitting the entire area of Herschel Island and all of the flora and fauna that live there. While blue carbon ecosystems are not specifically protected, they could be characterized as incidental beneficiaries. Given the collaborative management planning processes and research structures, Herschel Island may also provide opportunities for research and monitoring.

## **2021 WILDLIFE CONSERVATION AND MANAGEMENT PLAN FOR THE YUKON NORTH SLOPE (DRAFT)<sup>353</sup>**

The Wildlife Management Advisory Council for the Yukon North Slope (WMAC (NS) was established under subsection 12(46) of the IFA. The IFA directs the Council to “prepare a wildlife conservation and management plan for the Yukon North Slope for recommendation to the appropriate authorities as a means for achieving and maintaining the principles of conservation set out in subsections (2) and (3)”.<sup>354</sup>

As noted above, the modern treaty framework for the Yukon North will be discussed in detail in Phase 2 of this Discussion Paper, if approved. For now, it is simply important to note that this exists, at least in draft form, and will have a bearing on Ministerial decision making in this region once it is finalized.

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346. IFA, ss. 12(6).

347. IFA, ss. 12(18).

348. IFA, ss. 12(6).

349. IFA, ss. 12(2) and (42-44).

350. *Herschel Island Park Regulations*, s. 11.

351. Herschel Island- Qikiqtaruk Territorial Park Management Plan (2019), (accessed online: [https://yukon.ca/sites/yukon.ca/files/env/env-herschel-island-qikiqtaruk-territorial-park-management\\_plan.pdf](https://yukon.ca/sites/yukon.ca/files/env/env-herschel-island-qikiqtaruk-territorial-park-management_plan.pdf)).

352. Herschel Island – Qikiqtaruk – Territorial Park Management Plan (2006), p. 1.

353. Wildlife Management Advisory Council (North Slope), DRAFT *Wildlife Conservation and Management Plan for the Yukon North Slope* (2021) (accessed online: <https://wmacns.ca/resources/?id=344>, November 22, 2022). [Draft WCMP]

354. IFA, ss. 12(57(b))

## IVVAVIK NATIONAL PARK FRAMEWORK

The IFA required the creation of a National Park, to be managed as a “wilderness park” in the western part of the Yukon North Slope.<sup>355</sup> The goal was to protect the wilderness characteristics of the area, maintaining its present undeveloped state to the greatest extent possible.<sup>356</sup> Ivvavik National Park was established pursuant to the *National Parks Act* in and is listed in Schedule 1, Part 11 of that Act in 1984. It is bounded by the low water mark of the Beaufort Sea and encompass roughly half of the Yukon North Slope.

Pursuant to the *National Parks General Regulations*,<sup>357</sup> it is prohibited to remove, deface, damage or destroy any flora or natural objects in a Park except in accordance with a permit issued under subsection 11(1) or 12(1).<sup>358</sup> Further, where the superintendent deems it necessary for the prevention of any seasonal or temporary danger to persons, flora, fauna or natural objects in a Park, he may by notice in writing close to public use or traffic any area in the Park for the period he considers the danger will continue”.<sup>359</sup>

The *Ivvavik National Park Management Plan* (2018) is organized around several strategies: protection and conservation of natural ecosystems, respectful opportunities for use, tangible benefits to Inuvialuit, awareness around the contribution of the park to global natural and cultural diversity.<sup>360</sup> The Plan explains: “Climate change continues to alter the ecological and physical processes of the region at an ever-increasing rate. [...] As a national park, Ivvavik can play an important conservation role in these global issues. Commitment exists among partner agencies to share scientific, traditional and local information about changes in the environment and environmental stressors. Strategies that reduce regional human contributions to climate change will be identified and implemented where practical”.<sup>361</sup>

Beyond this acknowledgment, neither the Plan nor the Regulations references Key Blue Carbon Concepts. The Plan is to be reviewed in 10 years from the date of the Plan (or 2028). Associated engagement processes may provide an opportunity to include Key Blue Carbon Concepts and strategies.

## YUKON WILDLIFE ACT<sup>362</sup> AND REGULATIONS<sup>363</sup>

The *Yukon Wildlife Act* is a territorial statute enacted in 2002 as part of the mirror legislation following the Yukon Devolution Agreement. The YPLC Act applies throughout Yukon, including subject to the *Yukon Act* and modern treaties.

Under the YWA, the Commissioner in Executive Council may, by regulation, designate areas to protect species of wildlife. One of the means to do this is through the establishment of a Habitat Protection Area if the Commissioner in Executive Council is of the opinion that it is necessary to do so because of the sensitivity of the area to disturbance, the likelihood of disturbance and the importance of the area as habitat for any population, species or type of wildlife.<sup>364</sup> “Habitat” means the soil, water, food, vegetation and other components of the natural environment that are necessary to sustain wildlife.<sup>365</sup>

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355. IFA, ss. 12(5).

356. Ivvivik Plan, p. 13.

357. *National Parks General Regulations* (SOR/78-213).

358. *National Parks General Regulations*, s. 10.

359. *National Parks General Regulations*, s. 36(1).

360. Parks Canada Agency, *Ivvavik National Park of Canada Management Plan* (2018) (accessed online: <https://parks.canada.ca/pn-np/yt/ivvavik/gestion-management/gestion-management2018>, November 22, 2022) [Ivvivik Plan], p. vii.

361. Ivvivik Plan, p. 5.

362. *Yukon Wildlife Act*, RSY 2002, c. 229.

363. *Yukon Wildlife Regulation*, O.I.C. 2012/084.

364. *Yukon Wildlife Act*, s. 187.

365. *Yukon Wildlife Act*, s. 1.

Note that Habitat Protection Areas on lands administered by the Government of the Yukon may be withdrawn pursuant to subsection 7(1) of the Lands Act.<sup>366</sup>

Under the Regulations, Ts'alwnjik Chu - Nordenskiöld Wetland Habitat Protection Area has been designated.<sup>367</sup> However, no such areas have been established in a blue carbon ecosystem zone. Like fishery and conservation statutes discussed above, protection under this act is limited to the role of blue carbon ecosystems as habitat or incidental residents of areas critical to protected species.

#### **WITHDRAWAL FROM DISPOSITION OF CERTAIN YUKON OIL AND GAS LANDS (YUKON NORTH SLOPE) ORDER<sup>368</sup>**

Section 12(4) IFA required the withdrawal of lands within the North Slope to be maintained. Orders giving effect to this withdrawal requirement as necessary under the *Territorial Lands Act*, *Oil and Gas Act*,<sup>369</sup> and, the *Placer Mining Act*<sup>370</sup> have been replaced over time but have maintained the same language contained in Annex E-1 of the IFA.

This Order withdraws the Yukon oil and gas lands described in the Schedule from disposition for the reason that the lands are required for conservation purposes. This includes the area of the North Slope outside of the Ivvivik National Park, Herschel Island Territorial Park and the islands within 4.8km of the shoreline.<sup>371</sup>

This area is protected from those activities that would otherwise be permitted under the *Yukon Oil and Gas Act*.<sup>372</sup> This provides general protection from industrial interference in this area.

#### **PROHIBITION OF ENTRY ON CERTAIN LANDS (YUKON NORTH SLOPE) ORDER<sup>373</sup>**

Again, fulfilling the requirement under section 12(4) of the IFA, pursuant to section 98 of the *Placer Mining Act* and section 15 of the *Quartz Mining Act*, this Order prohibits entry into the North Slope for the reason that lands described in the Schedule to this Order are required for conservation purposes. This includes the area of the North Slope outside of the Ivvivik National Park and Herschel Island Territorial Park.<sup>374</sup>

This provides general protection from industrial interference in this area.

#### **WITHDRAWAL OF CERTAIN LANDS FROM DISPOSAL (YUKON NORTH SLOPE) ORDER<sup>375</sup>**

Again, fulfilling the requirement under section 12(4) of the IFA, pursuant to section 21 of the *Territorial Lands (Yukon) Act* this Order withdraws the tracts of territorial lands described therein from disposal for the reason that the lands are required for conservation purposes. This includes the area of the North Slope outside of the Ivvivik National Park, Herschel Island Territorial Park and the islands within 4.8km of the shoreline.<sup>376</sup>

This provides general protection from industrial interference in this area.

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366. *Yukon Wildlife Act*, s. 186.

367. *Yukon Wildlife Regulation*, s. 92.

368. *Withdrawal from Disposition of Certain Yukon Oil and Gas Lands (Yukon North Slope) Order*, O.I.C. 2010/009. [2010/009 Withdrawal Order]

369. *Oil and Gas Act*, RSY 2002, c. 162. Note: This Act applies to the "adjoining area" as defined in the *Yukon Act*, which includes the area from the low water mark to the northern limit of certain coastal indentations.

370. *Placer Mining Act*, SY 2003, c 13.

371. 2010/009 Withdrawal Order at p.3.

372. *Yukon Oil and Gas Act* RSY 2002, c. 162.

373. *Prohibition of Entry on Certain Lands (Yukon North Slope) Order*, O.I.C. 2010/048. [2010/048 Prohibition Order]

374. 2010/048 Prohibition Order at p. 3.

375. *Withdrawal of Certain Lands from Disposal (Yukon North Slope) Order*, O.I.C. 2010/053. [2010/053 Withdrawal Order]

376. 2010/053 Withdrawal Order at p. 3.

## 5.2 YUKON POLICY MEASURES

### DRAFT POLICY FOR THE STEWARDSHIP OF YUKON'S WETLANDS<sup>377</sup>

The *Draft Yukon Wetland Policy* was published in 2021. A final version was anticipated in 2022, though there is no public-facing sign of it. If adopted, it would apply to all wetlands in Yukon where the Government of Yukon has decision making authority and to all land uses and resource sectors under the control and administration of the Government of Yukon. The Draft Yukon Wetland Policy lists carbon storage and release as a function of wetlands and influencing atmospheric carbon and climate change as a benefit that can be derived from wetlands.<sup>378</sup>

The document prioritizes the development of an accurate and complete wetland inventory, which categorizes wetlands in accordance with the Canadian Wetland Classification System (i.e., bog, fen, marsh, swamp and shallow open water). The Draft Yukon Wetland Policy is intended to guide and support the government's stewardship decisions regarding wetlands.<sup>379</sup> The Draft Policy also identifies research priorities relating to wetlands, including Effects of northern wetlands on the carbon cycle.<sup>380</sup> Finally, the Draft Policy promotes the identification and protection of "Wetlands of Special Importance" due to the unique ecological characteristics and the benefits derived from them.

Such a designation could result in special consideration for these areas during planning processes and environmental assessments.<sup>381</sup> The criteria against which a potential wetland would be assessed, however, does not include carbon sequestration potential. Contributions to biodiversity and critical habitat, along with social or cultural importance for Yukon First Nations surface as the priorities supported through this policy.

### OUR CLEAN FUTURE: A YUKON STRATEGY FOR CLIMATE CHANGE, ENERGY AND A GREEN ECONOMY<sup>382</sup>

*Our Clean Future* is a Yukon Government policy that aims to reduce greenhouse gas emissions and build a green economy that protects and restores the natural environment. It is guided by four goals: Reduce Yukon's greenhouse gas emissions, Ensure Yukoners have access to reliable, affordable and renewable energy, adapt to the impacts of climate change, and, build a green economy. It is to guide the Yukon Government through to 2030.

This policy acknowledges that "some ecosystems, such as wetlands, will be more susceptible than others. It is important that we better understand how climate change is affecting the natural environment and take action to minimize the impacts on ecosystems, wild species and their habitats, and the people that depend on them".<sup>383</sup> *Our Clean Future* lists as a first action: "Establish a standardized method to determine the health status of wetland ecosystems and complete a pilot study to measure the baseline conditions of various reference wetlands by 2022 to better understand future changes".<sup>384</sup>

Blue carbon is not referenced, and wetlands generally are treated as passive observers (or impact recipients) in the climate change mitigation effort. If Yukon continues its collaborative approach to policy development, an engagement process can be expected to begin in 5 or 6 years. This would be an opportunity to incorporate Key Blue Carbon Concepts.

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377. Yukon Government, *Draft policy for the stewardship of Yukon's wetlands* (2021) (accessed online: <https://yukon.ca/en/draft-policy-stewardship-yukons-wetlands>, November 22, 2022). [Draft Yukon Wetland Policy]

378. Draft Yukon Wetland Policy, p. 2.

379. Draft Yukon Wetland Policy, p. 7-8.

380. Draft Yukon Wetland Policy, p. 8.

381. Draft Yukon Wetland Policy, p. 10.

382. Yukon Government, *Our Clean Future: A Yukon strategy for climate change, energy and a green economy* (2021) (accessed online: <https://yukon.ca/en/our-clean-future-yukon-strategy-climate-change-energy-and-green-economy>, November 22, 2022). [Our Clean Future]

383. *Our Clean Future*, p. 51.

384. *Our Clean Future*, p. 51.

## **ECOSYSTEMS OF THE YUKON ARCTIC REGION: A GUIDE TO IDENTIFICATION**<sup>385</sup>

This guide presents classification and identification information for ecosystems of the Yukon Arctic Region. It covers the fascinating history of glaciation across the territory. The guide organizes the Yukon Government's current understanding of the ecological relationships among vegetation communities, landscape position, soil and climate in the region.<sup>386</sup>

The objectives of the guide are:

- to consolidate knowledge of Yukon Arctic Region ecosystem diversity, characteristics and distribution;
- to promote a better understanding of arctic ecosystems and their inter-relationships;
- to provide a framework for organizing ecological information and management experience in arctic ecosystems;
- to provide resource managers with a common language to describe arctic ecosystems;
- to provide an ecological baseline for monitoring change; and
- to create "natural" ecosystem units for mapping and management initiatives such as wildlife habitat assessment and site-specific development reviews.<sup>387</sup>

The Yukon Ecosystems ID Guide does discuss the Yukon coastline, which has been the focus of this Discussion Paper. It states: "Although much of the Yukon coastline is affected by open wave action and is dominated by unstable gravel beaches and eroding bluffs, stable estuarine ecosites occur where the larger river systems enter the Beaufort Sea and deposit fine sediments into delta landforms. These ecosites, which occur at the freshwater/marine interface, are poorly sampled in the Yukon Arctic Region."<sup>388</sup>

This suggests an important data gap that may hinder blue carbon ecosystem knowledge and support initiatives and a possible research support opportunity in the region.

## **MANAGEMENT PLAN FOR YUKON AMPHIBIANS, 2013**<sup>389</sup>

As noted above, the *Yukon Wildlife Act* provides for the establishment of wildlife management plans. Among the six existing plans, the *Management Plan for Yukon Amphibians, 2013* could overlap with blue carbon ecosystem protection efforts through wetlands. The Wood Frog range follows the tree line which stops short of the Yukon North Slope coast.

Should that change at some point, the Plan includes general level protections like other wildlife species-focused policies. The Plan states: "Maintenance of these habitats is crucial for the survival of populations [...]. Documenting the locations of these habitats is important for land-use planning, environmental assessments and general habitat management. Landscape-level land-use planning will benefit amphibians by considering the need for habitat connectivity."<sup>390</sup>

These initiatives could be used to manage blue carbon ecosystems as well.

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385. Yukon Government, *Ecosystems of the Yukon Arctic Region: A Guide to Identification* (2022) (accessed online: <https://yukon.ca/sites/yukon.ca/files/env/env-ecosystems-yukon-arctic-region.pdf>, November 22, 2022). [Yukon Ecosystems ID Guide]

386. Yukon Ecosystems ID Guide, p. 3.

387. Yukon Ecosystems ID Guide, p. 4.

388. Yukon Ecosystems ID Guide, p. 160.

389. Government of Yukon, *Management Plan for Yukon Amphibians* (2013) Fish and Wildlife Branch, Yukon Department of Environment, Whitehorse, Yukon (accessed online: <https://yukon.ca/sites/yukon.ca/files/env/env-management-plan-yukon-amphibians.pdf>). [*Yukon Amphibian Management Plan*]

390. *Yukon Amphibian Management Plan* at p. 8.



# PART 6: NORTHWEST TERRITORIES LAWS & POLICIES

This section queries the legislative and policy tools specific to the Northwest Territories (NWT) that may relate to the protection and/or restoration Arctic coastal blue carbon ecosystems found there. This Part includes territorial source law and policy as well as federal laws that apply uniquely to this territory.

As with all of the Parts of this Discussion Paper, the mainland coast and arctic island coasts are subject to underlying Inuit rights. The *Inuvialuit Final Agreement*<sup>391</sup> (IFA) was ratified in 1984 and incorporated into Canadian law through the *Western Arctic (Inuvialuit) Claims Settlement Act*.<sup>392</sup> The governance and regulatory structures under the IFA will be analysed in greater detail in Phase 2 of the Discussion Paper.

Also similar to other Parts of this Discussion Paper, it is important to acknowledge that as a territory, NWT is on different legal footing than the provincial jurisdictions reviewed in the WECLAW and ECELAW Discussion Papers. While NWT is a creature of federal statute with powers delegated to it by federal Parliament rather than the *Constitution Act, 1867*, devolution over time has resulted in the territory exercising administration and control in ways similar to but not exactly the same as provinces or even other territories. As the purpose of this Discussion Paper is to bring existing legislation and policy that is relevant to blue carbon ecosystems to the fore, the analysis will not dive deeply into the Constitutional underpinnings except insofar as rights under s. 35 of the *Constitution Act, 1982* are concerned.

A final organizing note, an effort has been made in this Discussion Paper to show every potentially relevant statute and policy document so that as this dialogue is continued, this work does not need to be redone. While the documents listed here have been reviewed in the hopes of finding blue carbon sequestration protections or *potential* protections, some of these just do not have much to recommend. In those cases, this Discussion Paper will indicate: “No references were found to Key Blue Carbon Concepts”. These include: plants, seaweed, algae, eelgrass, habitat, wetlands, marsh, mudflats, tidal, nearshore, climate, carbon, sequestration, dredging, etc.

## 6.1 NORTHWEST TERRITORIES STATUTES AND REGULATIONS

### NORTHWEST TERRITORIES LANDS AND RESOURCES DEVOLUTION AGREEMENT, 2014<sup>393</sup>

Territorial devolution processes are influenced by many factors and result in a multiplicity of regulatory and governance approaches to lands, resources and the environment. A quick note on the status of devolution in NWT may be helpful in understanding how it fits among the northern jurisdictions.

The Northwest Territories Lands and Resources Devolution Agreement was signed on June 25, 2013. The *Northwest Territories Devolution Act* was assented to March 25, 2014 and gave effect to the terms of the NWT Devolution Agreement. Pursuant to the NWT Devolution Agreement and the Act, responsibility for public land, water and resource management in the Northwest Territories from the federal department of Aboriginal Affairs and Northern Development Canada (AANDC) to the GNWT on April 1, 2014.

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391. *Inuvialuit Final Agreement* (1984), as amended.

392. *Western Arctic (Inuvialuit) Claims Settlement Act*, S.C. 1984, c. 24.

393. *Northwest Territories Lands and Resources Devolution* (2014) Agreement (accessed online: <https://www.eia.gov.nt.ca/sites/eia/files/final-devolution-agreement.pdf>, November 22, 2022).

The Government of the Northwest Territories (GNWT) committed to “substantially mirror” Canada’s statutes and regulations that were repealed or made inapplicable to all land, except federally retained land, transferring to the GNWT through devolution.<sup>394</sup> Following this mirroring exercise GNWT the new GNWT laws address the same matters, in substantially the same way, as federal laws did before devolution. This also means that GNWT now shares obligations pursuant to land claims agreements that may have previously been the sole purview of the federal government.

A number of new pieces of legislation have since been collaboratively developed with Indigenous governing bodies. Those relevant to blue carbon sequestration are detailed below.

### **NORTHWEST TERRITORIES ACT (CANADA)<sup>395</sup>**

The NWT Act is a federal statute, which sets out, among other things, the structure of the NWT Government and law-making powers of the Legislature. The current version of the Act replaced elements of its predecessor legislation in 2014 in order to implement provisions of the NWT Devolution Agreement.

The boundaries of the NWT are distinct from its neighbour to the west. The NWT Act defines the NWT as “that part of Canada that is north of the 60th parallel of north latitude, west of the boundary described in Schedule I to the Nunavut Act and not within Yukon”.<sup>396</sup> This means that the boundaries of the territory extend from Yukon to Nunavut and out to the edge of Canada’s jurisdiction in the offshore and includes islands of the Arctic Archipelago and their coastlines. While the boundaries include vast marine areas, subject matter jurisdiction differs between the on and offshore. The description of what is included in the onshore is relevant to the question about which level of government has jurisdiction over blue carbon ecosystems; but, it is cumbersome. Very generally, the onshore includes lands on the landward side of the low water mark or, in the Inuvialuit Settlement Region, the mean highwater mark; lands under water within small enclosed bays along the coast of the mainland and islands; and, those lands landward of the line of delimitation where it lies farther out to sea.

In terms of law-making power, the NWT Legislature may make laws, among other areas, in relation to the following subjects: the conservation of wildlife and its habitat; waters under the administration and control of the Commissioner; and, public lands that are under the administration and control of the Commissioner.<sup>397</sup> Note that NWT has administration and control of lands and waters but not rights and title. The NWT Legislature may also make laws for application in the onshore in relation to exploration for and development, conservation and management of non-renewable natural resources; oil and gas pipelines that are situated entirely in the onshore.<sup>398</sup>

Demonstrating the difference between territories and provinces, Canada can, subject to a consultation requirement, take from the Commissioner the administration and control of public lands and rights in respect of waters if the Governor in Council considers it necessary for the national interest, establishing or changing the boundaries of a national park, the fulfilment of an obligation in respect of an Aboriginal or treaty right that is referred to in section 35 of the Constitution Act, 1982; or the settlement of an Aboriginal land claim or the implementation of an Aboriginal land claim agreement or other treaty, a settlement agreement or a self-government agreement.<sup>399</sup>

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394. NWT Devolution Agreement, s.

395. *Northwest Territories Act*, S.C. 2014, c. 2.

396. *Northwest Territories Act*, s. 2.

397. *Northwest Territories Act*, s. 18.

398. *Northwest Territories Act*, s. 19.

399. *Northwest Territories Act*, s. 55.

## NORTHWEST TERRITORIES FISHERIES REGULATIONS<sup>400</sup>

The *NWT Fisheries Regulations* are older federal Regulations enabled pursuant to the *Fisheries Act*. These Regulations apply in “Canadian fisheries waters in and adjacent to the Northwest Territories and the tidal waters of the provinces of Ontario and Manitoba”.<sup>401</sup> Enacted prior to the creation of Nunavut, the NWT therein referenced includes what is now Nunavut. To help situate the reader, the following map (Figure 5) taken from these Regulations shows “NWT” according to its pre-Nunavut boundaries and the absence of a jurisdictional boundary between the onshore and the offshore:

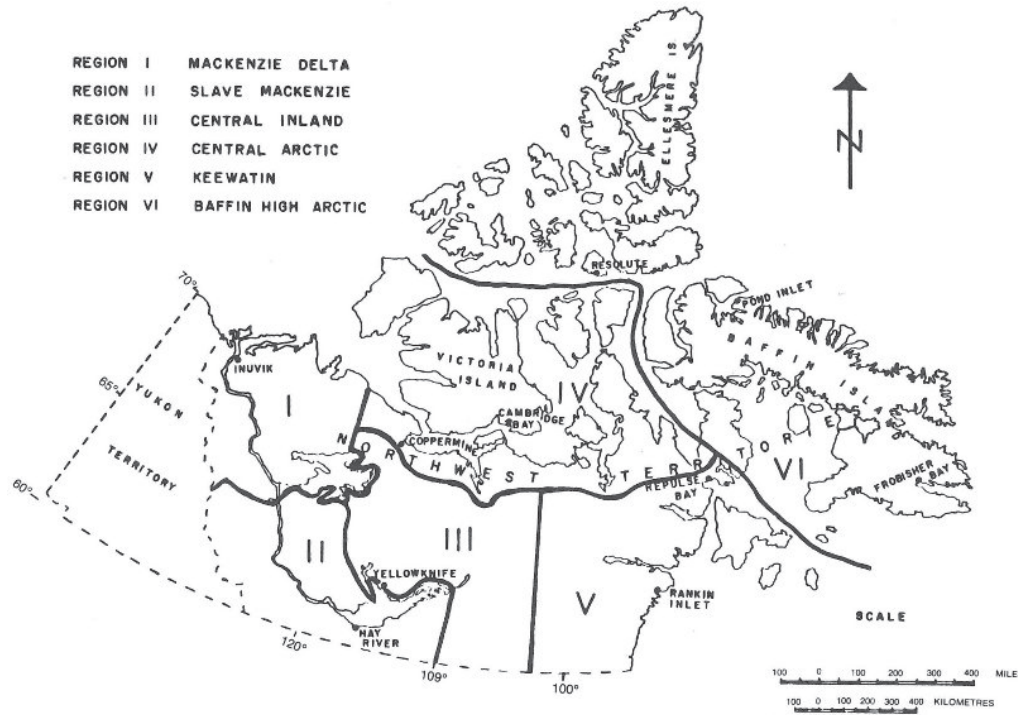


Figure 5. Northwest Territories Commercial Fishing Regions.<sup>402</sup>

These Regulations authorize the issuance of licenses for sport and commercial fishing, Indigenous access, and catch limits. The *NWT Fisheries Regulations* address activities that may impact on the health of the fishery including stream crossing prohibition, logging and gravel removal.<sup>403</sup> While these do address certain habitat concerns, the provisions may be characterised as “regulation lite”. A central feature of the regulatory approach, if the Minister believes the fishery in any waters would be harmed by certain operations, including harm and disruption of fish habitat, the Minister can direct someone to put up signs disallowing that activity.<sup>404</sup>

Beyond these general fishery protections, there is no reference to marine or coastal waters or other Key Blue Carbon Concepts.

400. *Northwest Territories Fishery Regulations*, C.R.C., c. 847.

401. *Northwest Territories Fishery Regulations*, s. 3(1).

402. *Northwest Territories Fishery Regulations*, Schedule V

403. *Northwest Territories Fishery Regulations*, s. 3(1).

404. *Northwest Territories Fishery Regulations*, s. 12(1).

## **NWT ENVIRONMENTAL PROTECTION ACT<sup>405</sup>**

This is a pre-devolution territorial statute, though a few provisions were amended in 2017. It applies to the “whole of the Northwest Territories”.<sup>406</sup>

The *NWT EPA* prohibits the discharge of contaminants into the “environment”, subject to a list of exceptions.<sup>407</sup> The *NWT EPA* also authorizes the Minister to take a range of actions regarding the discharge of contaminants into the environment and develop, co-ordinate and administer regulations and policies relating to the preservation, protection or enhancement of the environment.<sup>408</sup> The Minister may delegate these functions to a Chief Environmental Protection Officer.<sup>409</sup> The Commissioner in Executive Council may also exempt individuals from the provisions of the Act.<sup>410</sup>

Environment is defined broadly. The term means: “the components of the Earth and includes (a) air, land and water, (b) all layers of the atmosphere, (c) all organic and inorganic matter and living organisms, and (d) the interacting natural systems that include components referred to in paragraphs (a) to (c).”<sup>411</sup> This would encompass any blue carbon ecosystems within NWT, arguably regardless of their onshore/offshore location.

Actions taken under this Act to deter the deposit deleterious substances into locales where blue carbon ecosystems might be found is a general support. However, the broad exemption authority and lack of any reference to blue carbon ecosystems as a valued component of the NWT environment weaken even this amount of protection. The Act does not directly reference Key Blue Carbon Concepts.

## **NWT ENVIRONMENTAL RIGHTS ACT<sup>412</sup>**

The *NWT Environmental Rights Act* is a territorial statute that received significant amendments following devolution and came into force in 2019. It applies within the NWT without onshore/offshore distinction and enables the GNWT to assume responsibility for elements of the *Canadian Environmental Protection Act* within NWT. The Act provides an overarching commitment to ensuring a healthy environment for NWT citizen.<sup>413</sup>

The Act is framed around concepts of environmental rights belonging to NWT residents, personal interest and agency in defending those rights, the environment as a public trust, and, government as trustee of that public trust. The purposes of the NWT ERA provide the scaffolds of that framework. These purposes include: protecting the right of the people of the Northwest Territories to a healthy Environment; providing the people of the Northwest Territories with tools to exercise their right to protect the integrity, biological diversity and productivity of the ecosystems in the Northwest Territories; and, ensuring the GNWT carries out its responsibility, within its jurisdiction, to protect the environmental rights of the people of the Northwest Territories.<sup>414</sup>

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405. *Northwest Territories Environmental Protection Act*, RSNWT 1988, c E-7. Note: *An Act to Amend NWT Environmental Protection Act* received 3<sup>rd</sup> reading in 2017 but did not pass.

406. *NWT EPA*, s. 2(1).

407. *NWT EPA*, s. 5.

408. *NWT EPA*, s. 2.2.

409. *NWT EPA*, s. 3.

410. *NWT EPA*, s. 2.01.

411. *NWT EPA*, s. 1.

412. *Environmental Rights Act*, S.N.W.T. 2019,c.19. [NWT ERA]

413. GNWT, *Environmental Rights Act* (accessed online: <https://www.enr.gov.nt.ca/en/services/legislative-initiatives/environmental-rights-act>).

414. *NWT ERA*, s. 2.

Environment and Public trust are key terms for understanding the interaction of this Act with blue carbon ecosystems. Environment is defined broadly as it is in analogous legislation in this Discussion Paper. The term includes air, land, surface water, groundwater, snow and ice, layers of the atmosphere, organic and inorganic matter and living organisms, and, the interacting natural systems that include the other components. Public trust means the collective interest of the people of the Northwest Territories in the quality of the environment and the protection of the environment for future generations.<sup>415</sup> These definitions would encompass any blue carbon ecosystem within NWT and could include the value that these ecosystems bring in terms of their sequestration potential.

The NWT ERA gives extends agency to NWT residents to respond to environmental degradation that they may witness. The Act authorizes any individual resident in the Northwest Territories who believes, on reasonable grounds, that an act or omission has occurred that has caused or is likely to cause significant harm to the environment, may apply to the Minister for an investigation. Further, if the Minister declines or discontinues an investigation the applicant may, appeal to the Supreme Court.<sup>416</sup> Residents may also exercise their right to protect the environment and the public trust, by commencing an action in the Supreme Court against any person for any act or omission that the resident believes on reasonable grounds has caused or is likely to cause significant harm to the environment.<sup>417</sup>

A final note, the Executive Council of the NWT Legislature must prepare a Statement of Environmental Values, which serves to incorporate environmental considerations into government decision-making. The Act sets out principles that may be considered, including the precautionary, polluter pays, ecological sustainability and intergenerational equity.<sup>418</sup> These principles are certainly tenets of mainstream environmental law but are nonetheless helpful points of advocacy in support of blue carbon ecosystems – particularly where data may be lacking and the direct impact on current NWT residents may be difficult to evaluate. The Statement of Environmental Values developed pursuant to these provisions is discussed below.

The NWT ERA transforms NWT residents from passive recipients of environmental impacts into rights-holders and advocates. Awareness of the role of blue carbon ecosystems and the avenues they may use to see redress for potential harms among NWT residents becomes particularly important as a result.

### ***NWT PROTECTED AREAS ACT***<sup>419</sup>

The *Protected Areas Act* is a territorial statute that was developed following devolution in collaboration with Indigenous governments and organizations, regulatory boards, stakeholders and the public. It came into force on June 20, 2019. It applies throughout the NWT, subject to Indigenous rights and title and private landholdings.

The purpose of the NWT PAA “is to support and promote the protection, conservation and maintenance of biodiversity, ecological integrity, and cultural continuity of the Northwest Territories through the creation of a representative network of protected areas intended to be permanent for the benefit of current and future generations”.<sup>420</sup>

The Act has broad coverage of environmental components and systems thanks to inclusive terms. Biodiversity is defined as “the full variety of life, including the biological and genetic diversity of aquatic and terrestrial animals

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415. NWT ERA, s. 1.

416. NWT ERA, s. 8(8).

417. NWT ERA, s. 13(1) and (2).

418. NWT ERA, s. 17 (1.1).

419. *Protected Areas Act*, SNWT 2019,c.11. [NWT PAA]

420. NWT PAA, s. 2.

and plants, at whatever scale is under consideration”.<sup>421</sup> Ecological integrity is defined to include “the native components and conditions of the ecosystems that are characteristic of the Northwest Territories and that are likely to persist into the future”.<sup>422</sup> The NWT PAA includes the following within native components: abiotic and biotic components, including water and soils; biological communities, including their composition, abundance and diversity; natural biological processes, including taxa movement rates, and physical processes, including wildfires; and rates of change, including succession.<sup>423</sup> These terms are broad enough to include blue carbon ecosystems within the ambit of the NWT PAA.

Protections are activated upon the establishment, by the Commissioner in Executive Council through regulation.<sup>424</sup> Candidate areas may first be established as candidate protected areas. Before a candidate protected area is established as a protected area, the Minister, must enter into an establishment agreement for the protected area with one or more Indigenous governments or organizations that the Executive Council has identified should be parties in the establishment of a protected area.<sup>425</sup> The Minister must list these areas in a public registry.<sup>426</sup> Management plans are required, and funding arrangements are authorized.<sup>427</sup> The protections within these areas are permanent, though subject to licensing and include, among other things prohibitions against damage, removal or destruction of vegetation except where it is for personal use, artisanal use, use by an adjacent community, protected area management, authorized research.<sup>428</sup>

The Protected Areas Registry currently includes two Candidate Protected Areas: Dinàgà Wek’èhodì is a Candidate Area (North arm of Great Slave Lake) and Ts’udé Niljné Tuyeta (West of the Mackenzie River). The Registry includes one Protected Area: Thaidene Nënë Territorial Protected Area (extending Northeast from Łutselk’e).<sup>429</sup>

While none of these areas cover blue carbon lands, the tools in this Act could be used, subject to the IFA, to create a layer of protection for these ecosystems.

### **NWT WILDLIFE ACT<sup>430</sup>**

The *NWT Wildlife Act* is a territorial statute that was developed with Indigenous governments and organizations and other stakeholders following the finalization of the NWT Devolution Agreement. It passed into law in 2013. This Act applies, subject to treaties, throughout the NWT.

The Act is centered around the conservation of wildlife. Protections for plant life is extended by virtue of its habitat function. The key terms and principles demonstrate this. Wildlife means (a) all species of vertebrates and invertebrates found wild in nature in the Northwest Territories, except fish. As such, the protection of blue carbon ecosystems under the NWT WA must rely on the terrestrial or amphibian residents of those ecosystems. Conservation means the management and protection of wildlife and habitat, and their use in a manner that promotes their continued survival and maintains ecosystem integrity. And, habitat means the area or type of site where a species or an individual of a species of wildlife naturally occurs or on which it depends, directly or indirectly, to carry out its life processes.<sup>431</sup> Further, wildlife is to be conserved for its intrinsic value and for the

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421. NWT PAA, s. 1(1).

422. NWT PAA, s. 1(2).

423. NWT PAA, s. 1(3).

424. NWT PAA, s. 17(1).

425. NWT PAA, s. 1(1).

426. NWT PAA, s. 9.

427. NWT PAA, s.1 9.

428. NWT PAA, s. 13.

429. Protected Areas Registry (accessed online: <https://www.enr.gov.nt.ca/en/services/protected-areas-registry>, November 22, 2022).

430. *Wildlife Act*, S.N.W.T. 2013,c.30. [*NWT Wildlife Act*]

431. *NWT Wildlife Act*, s. 1.



benefit of present and future generations, the conservation and management of wildlife and habitat is to be carried out on an ecosystem basis and this work is to proceed on a precautionary basis.<sup>432</sup>

Insofar as protection by extension is an effective measure for blue carbon ecosystem protection, the Act prohibits substantial alteration, damage and destruction of wildlife habitat.<sup>433</sup> Further, the Commissioner in Executive Council is authorized to make regulations designating areas of the Northwest Territories as Conservation Areas with distinctive names or numbers.<sup>434</sup> Finally, the Government of the Northwest Territories has a right of action in damages against a person who, without legal justification, alters, damages or destroys habitat.<sup>435</sup>

### **NWT CONSERVATION AREA REGULATIONS<sup>436</sup>**

The *NWT Conservation Area Regulations* were enabled pursuant to the *NWT WA* and came into force in 2019. These designate as conservation areas the Bluenose Calving Critical Wildlife Areas, the Mackenzie Bison Sanctuary, the Peel River Preserve, the Thelon Wildlife Sanctuary and the Thaidene Nënë Wildlife Conservation Area. These Regulations do not cover any coastal areas or reference any Key Blue Carbon Concepts.

### **INUVIALUIT SETTLEMENT REGION HUNTERS AND TRAPPERS COMMITTEE REGULATIONS**

While the regulatory framework under the IFA is anticipated for a Phase 2 of this Discussion Paper, it is helpful context here to note that subsection 14(75) of the IFA requires the establishment of a community Hunters and Trappers Committee (HTC). Each HTC must make by-laws, subject to the laws of general application, governing the exercise of the Inuvialuit rights to harvest. These HTC Bylaws are incorporated as regulations pursuant to the *Wildlife Act*.<sup>437</sup> These HTC Regulations establish rules surrounding the harvest of (variously) polar bear, grizzly bear, muskoxen, wolves, lynx, caribou. Notably, is no reference to habitat protection, flora, or other Key Blue Carbon Concepts.

### **NWT WATERS ACT<sup>438</sup> AND NWT WATERS REGULATIONS<sup>439</sup>**

The *NWT Waters Act* is a territorial statute enacted in 2014 as one among the suite of mirror legislation required under the NWT Devolution Agreement. This Act applies across NWT, although, a distinct regulatory regime, under the auspices of the Inuvialuit Water Board, applies in the Inuvialuit Settlement Region.

This Act applies a system of thresholds, use types, licenses and prohibitions to the use of waters and the deposit of waste in waters.<sup>440</sup> Waters means water under the administration and control of the Commissioner, whether in a liquid or frozen state, on or below the surface of land.<sup>441</sup> The overarching prohibitions dictate that “no person shall use, or permit the use of, waters in a water management area<sup>442</sup> or deposit waste in a water management area except where authorised by licence or by regulations.”<sup>443</sup>

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432. *NWT Wildlife Act*, s. 2(1).

433. *NWT Wildlife Act*, s. 93(1).

434. *NWT Wildlife Act*, s. 89(1) and (2).

435. *NWT Wildlife Act*, s. 94.

436. *NWT Conservation Area Regulations*, R-074-2019.

437. *Inuvialuit Final Agreement*, s. 14(75).

438. *NWT Waters Act*, S.N.W.T. 2014, c.18.

439. *NWT Waters Regulations*, R-019-2014.

440. *NWT Waters Act*, s. 2(2).

441. *NWT Waters Act*, s. 1.

442. *NWT Waters Act*, s. 10(1).

443. *NWT Waters Act*, s. 11(1).

The *Waters Regulations* establish the “Mackenzie River, its tributaries and all river basins of the Mackenzie River and its tributaries” and “all other waters and river basins draining into the Arctic Ocean or adjacent waters as a “water management areas”.<sup>444</sup> These systems could impact blue carbon ecosystems along the coasts of the Beaufort Sea and Arctic Oceans where they exist and would be subject to the protections under the Act.

### **NWT TERRITORIAL PARKS ACT<sup>445</sup> AND NWT TERRITORIAL PARKS REGULATIONS<sup>446</sup>**

The *Territorial Parks Act* is a territorial statute first enacted in 1988 and amended several times since. It applies throughout the Northwest Territories.

The Act authorizes the Minister to establish Territorial Parks according to one of the following classifications: Cultural Conservation Area, Heritage Park, Recreation Park and Wayside Park. (5) A park established under this section is subject to the terms and conditions of any relevant land claims agreement in effect in the Northwest Territories.<sup>447</sup> Most likely to be relevant to blue carbon ecosystem protection, Cultural Conservation Areas “may be developed to protect the culturally significant site or landscape, and industrial activity may be prohibited”.<sup>448</sup>

Territorial Parks are subject to the following general prohibitions subject only to an Act of Canada: establish, engage in or conduct a business, commercial enterprise or industrial activity, acquire a surface right or the right to use or occupy the surface of any land, hunt or molest game or a game bird or migratory game bird, have in his or her possession or explode or discharge an explosive device, firearm, spring gun, bow or device that fires or propels projectiles, or construct, alter or move a building, structure, fixture, sign or means of access”.<sup>449</sup> Subject to regulations, “no person shall damage or destroy a natural feature, or damage or remove a building, furnishing or equipment; deposit or leave garbage, sewage, refuse or any noxious material; have in his or her possession an animal unless the animal is on a leash or under his or her direct physical control; permit horses or other domesticated livestock to roam at large; or operate a motor vehicle, except in an area designated for that purpose.”<sup>450</sup>

The *Territorial Parks Regulations* further state that “no person shall, in a Territorial Park, deposit or leave garbage, sewage, bottles, cans, paper, plastic containers or other litter, waste or obnoxious material in a place other than in a receptacle or pit provided for that purpose”.<sup>451</sup> The Regulations allow individuals to apply for exceptions to the general prohibitions in the Act.

Beyond establishing authorities for area-based protections, this Act does not specifically address factors that may threaten blue carbon ecosystems or reference Key Blue Carbon Concepts.

### **AULAVIK AND TUKTUT NOGAIT NATIONAL PARKS (NATIONAL PARKS ACT, SCHEDULE 1)**

The Tuktut Nogait National Park is listed under Schedule 1 Part 12 of the *National Parks Act*. Tuktut Nogait means “young caribou” and is located east of Paulatuk. Because it lies inland from the coast, the protections afforded under the *National Parks Act* would not likely cover blue carbon ecosystems that may exist in that area.

The Aulavik National Park and is also listed under Schedule 1 Part 12 of the *National Parks Act*. Aulavik means “place where people travel”. This park is located at the northern end of Banks Island and extends to the low water mark along the Arctic coast of that island. It includes the Thomsen River. The Aulavik National Park of

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444. *NWT Waters Regulations*, Schedule A..

445. *Territorial Parks Act*, S.N.W.T. 2019, c.11.

446. *Territorial Parks Regulations*, RRNWT 1990,c.T-13(Supp.).

447. *Territorial Parks Act*, s. 3(1).

448. *Territorial Parks Act*, s. 3(3).

449. *Territorial Parks Act*, s. 12.

450. *Territorial Parks Act*, s. 13.

451. *Territorial Parks Regulations*, s. 4.

Canada management plan, 2012, notes that “Aulavik includes fertile river valleys, deserts, buttes and badlands, rolling hills, and a high Arctic seacoast. Aulavik and Banks Island are home to the endangered Peary caribou and the world’s largest population of muskoxen. Arctic hare, fox, wolf, and lemming are common. Coastal waters are habitat for polar bear, ringed and bearded seal, beluga and bowhead whales. Many species of waterfowl and other birds, such as peregrine falcons and sandhill cranes, nest within the park”.<sup>452</sup> Beyond recognizing the importance of coastal waters for marine mammals and fish, the Management Plan does not specifically target habitats that may also be blue carbon ecosystems.

Both Parks are subject to the *National Parks General Regulations*,<sup>453</sup> under which it is prohibited to remove, deface, damage or destroy any flora or natural objects in a Park except in accordance with a permit issued under subsection 11(1) or 12(1).<sup>454</sup> Further, where the superintendent deems it necessary for the prevention of any seasonal or temporary danger to persons, flora, fauna or natural objects in a Park, he may by notice in writing close to public use or traffic any area in the Park for the period he considers the danger will continue”.<sup>455</sup>

For reference for those unfamiliar with the region, these parks are depicted in the map below (Figure 6).



Figure 6. Boundaries of Aulavik National Park and Tuktut Nogait National Park<sup>456</sup>

452. Aulavik National Park of Canada management plan, 2012 (accessed online: <https://parks.canada.ca/pn-np/nt/aulavik/gestion-management/plan/plan2>), p. 4.

453. *National Parks General Regulations* (SOR/78-213).

454. *National Parks General Regulations*, s. 10.

455. *National Parks General Regulations*, s. 36(1).

456. Parks Canada, *National Parks and Historic Sites*, (accessed online: <https://parks.canada.ca/pn-np/nt/tuktutnogait/nature-science/carte-map>, November 22, 2022).

## TARIUM NIRYUTAIT MARINE PROTECTED AREAS REGULATIONS<sup>457</sup>

\*PLEASE NOTE: The Tarium Niryutait Marine Protected Areas were established in close cooperation with the co-management regime established under the IFA and the Beaufort Sea Partnership. These facets of the management, monitoring and oversight of the ANMPA would be discussed in a Phase 2 Discussion Paper.

In 2010, the Tarium Niryutait Marine Protected Areas Regulations designated the Niaqunnaq, the Okeevik, and the Kittigaryuit as Protected Areas (together, the TNMPA) pursuant section 35(3) of the *Oceans Act*.<sup>458</sup> In these Regulations, “waters” is defined as including the seabed and subsoil below the waters to a depth of five metres. All of these areas lie within the Inuvialuit Settlement Region.

The Regulations prohibit the disruption, damage to, destruction of and removal from the Areas of any living marine organism or any part of its habitat. Further, no one is permitted to “carry out any activity in the Areas — including depositing, discharging or dumping any substance, or causing any substance to be deposited, discharged or dumped — that is likely to result in the disturbance, damage, destruction or removal of a living marine organism or any part of its habitat”.<sup>459</sup>

There are several exceptions to these prohibitions, however. The TNMPA Regulations permit fishing in accordance with the *Fisheries Act*, limited dredging, geophysical operations, drilling and hydrocarbon production and ship activity.<sup>460</sup> While activities under these exceptions are specifically limited to actions that would not result in the disturbance, damage, destruction or removal of a marine mammal, blue carbon resources are not specifically identified as requiring protection pursuant to those exceptions.

The 2013 *Tarium Niryutait Marine Protected Areas Management Plan* <sup>461</sup> “provides guidance to the FJMC, DFO, communities, other regulators, partners, and proponents on aspects related to management of the TNMPA. The plan describes the regulatory authority related to the TNMPA in the ISR and the context within broader Oceans Management planning within the Beaufort Sea Large Ocean Management Area (LOMA)”.<sup>462</sup> However, this plan does not reference any Key Blue Carbon Concepts.

## ANGUNIAQVIA NIQIYUAM MARINE PROTECTED AREAS REGULATIONS (ANMPA REGULATIONS)<sup>463</sup>

\*PLEASE NOTE: The Anguniaqvia niqiyuam Marine Protected Areas were established in close cooperation with the co-management regime established under the IFA and the Beaufort Sea Partnership. These facets of the management, monitoring and oversight of the ANMPA would be discussed in a Phase 2 Discussion Paper.

In 2016, the Anguniaqvia niqiyuam Marine Protected Areas Regulations designated the area of the sea in Darnley Bay and Amundsen Gulf in the Beaufort Sea consisting of the waters within the boundaries of Zone 1 and e area of the sea in Kendall Inlet in Amundsen Gulf in the Beaufort Sea consisting of the waters within the boundaries of Zone 2 as Protected Areas (together, the ANMPA) pursuant section 35(3) of the *Oceans Act*.<sup>464</sup> All of these areas lie within the eastern portion of the Inuvialuit Settlement Region and the Northwest Territories.

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457. *Tarium Niryutait Marine Protected Areas Regulations*, SOR/2010-190. [TNMPA Regulations]

458. TNMPA Regulations, ss. 3-5.

459. TNMPA Regulations, s. 6.

460. TNMPA Regulations, s. 7.

461. *Tarium Niryutait Marine Protected Areas Management Plan*, 2013 (accessed online: [http://www.beaufortseapartnership.ca/wp-content/uploads/2015/05/tnmpa-mgmt-plan\\_final.pdf](http://www.beaufortseapartnership.ca/wp-content/uploads/2015/05/tnmpa-mgmt-plan_final.pdf), November 22, 2022). [TNMPA Plan]

462. TNMPA Plan, p. 3.

463. Anguniaqvia niqiyuam Marine Protected Areas Regulations, SOR/2016-280. [ANMPA Regulations]

464. ANMPA Regulations, s. 2.

The These regulations address the inclusion of the seabed somewhat differently. Instead of defining “waters” to include the seabed, subsection 2(3) states: “Each Marine Protected Area consists of the seabed, the subsoil to a depth of five metres and the water column, including the sea ice, each of which is below the low-water line”.<sup>465</sup> The Regulations state that “It is prohibited in the Marine Protected Areas to carry out any activity that disturbs, damages, destroys or removes from the Marine Protected Areas any living marine organism or any part of its habitat or is likely to do so”.<sup>466</sup>

As with the TNMPA Regulations, there are several exceptions to these prohibitions. Sections 4-7 permit limited dredging, geophysical operations, drilling and hydrocarbon production and ship activity<sup>467</sup>. Notably, this more recent set of regulations includes an extensive framework for activity planning and notification relating to scientific research or monitoring activity, educational activity or commercial marine tourism activity in the ANMPA.<sup>468</sup> The Activity Plan allows for closer scrutiny of the impacts of excepted activities on the species within the area. Certain exceptions relating to fishing and dredging operate to support the rights and requirements of Inuvialuit living in the region, reflecting the close association between these MPAs and the Inuvialuit communities involved in their establishment and maintenance.<sup>469</sup>

## NWT MIGRATORY BIRD SANCTUARIES (CANADA)

There are five Migratory Bird Sanctuaries established or continued in NWT pursuant to the *Migratory Birds Convention Act*.<sup>470</sup> As noted above, the *Migratory Bird Sanctuary Regulations* prohibit any activity that is harmful to migratory birds or the eggs, nests or habitat of migratory birds, except under authority of a permit”.<sup>471</sup> The areas within these sanctuaries are protected by virtue of the protections afforded to the migratory birds that use those areas through the habitat services provided by blue carbon ecosystems. Notably, many of these areas the straddle terrestrial/marine divide, helping to organize around the jurisdictional bifurcations that affect other areas of coastline.

While the *Migratory Birds Convention Act* may not provide targeted or even robust protections to blue carbon ecosystems, the following descriptions of coastal MBS are provided in an effort to paint a fuller picture of the conservation landscape in this vast region.

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465. ANMPA Regulations, s. 2(3).

466. ANMPA Regulations, s. 3.

467. ANMPA Regulations, ss. 4-7.

468. ANMPA Regulations, s. 9.

469. DFO, ANMPA (<https://www.dfo-mpo.gc.ca/oceans/mpa-zpm/anguniaqvia-niqiqyuam/index-eng.html>).

470. *Migratory Birds Convention Act*, S.C. 1994, c. 22

471. MBCR, s. 10(1).



**The Anderson River Delta Migratory Bird Sanctuary:** This MBS is located 160 kilometres east of Tuktoyaktuk (Figure 7). The Anderson River flows through the sanctuary, running through a series of low rolling hills vegetated by willow, dwarf birch and open spruce forest until it empties into Wood Bay. The lower portion of the river lies in a flood plain, which, near the coast, widens into a delta containing marshes, patterned ground, small lakes and ponds. The outer delta, the newest and lowest portion of the delta, is a series of islands and mud bars that are frequently washed by storm surges. The middle delta contains marshes and grasslands. The inner delta is the oldest section; it is flat and studded with lakes, lush marshy meadows and shallow sloughs.<sup>472</sup>

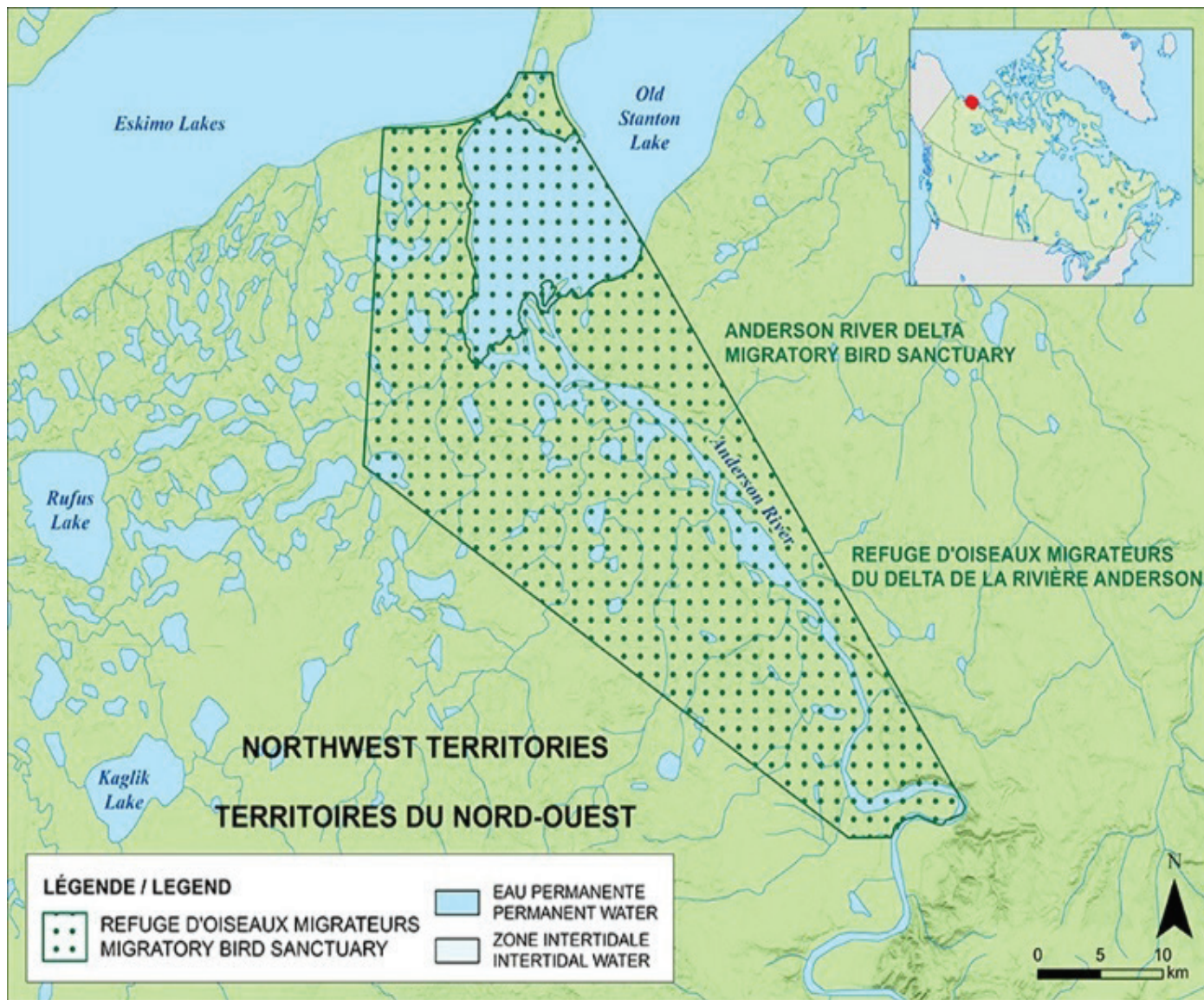


Figure 7. Map of Anderson River Delta Migratory Bird Sanctuary<sup>473</sup>

472. Government of Canada, Anderson River Delta Migratory Bird Sanctuary (accessed online: <https://www.canada.ca/en/environment-climate-change/services/migratory-bird-sanctuaries/locations/anderson-river-delta.html>, November 22, 2022).

473. *Ibid.*



**Banks Island Migratory Bird Sanctuary No. 1:** Established in 1961, this MBS is located adjacent to the Inuvialuit community of Sachs Harbour (Figure 8). The area includes a series of rivers that flow into the Beaufort Sea. As the rivers approach the west coast of the island, they become highly braided, entering the sea through broad, hallow, marshy deltas. there are areas of lush plant cover within the sanctuary.<sup>474</sup>

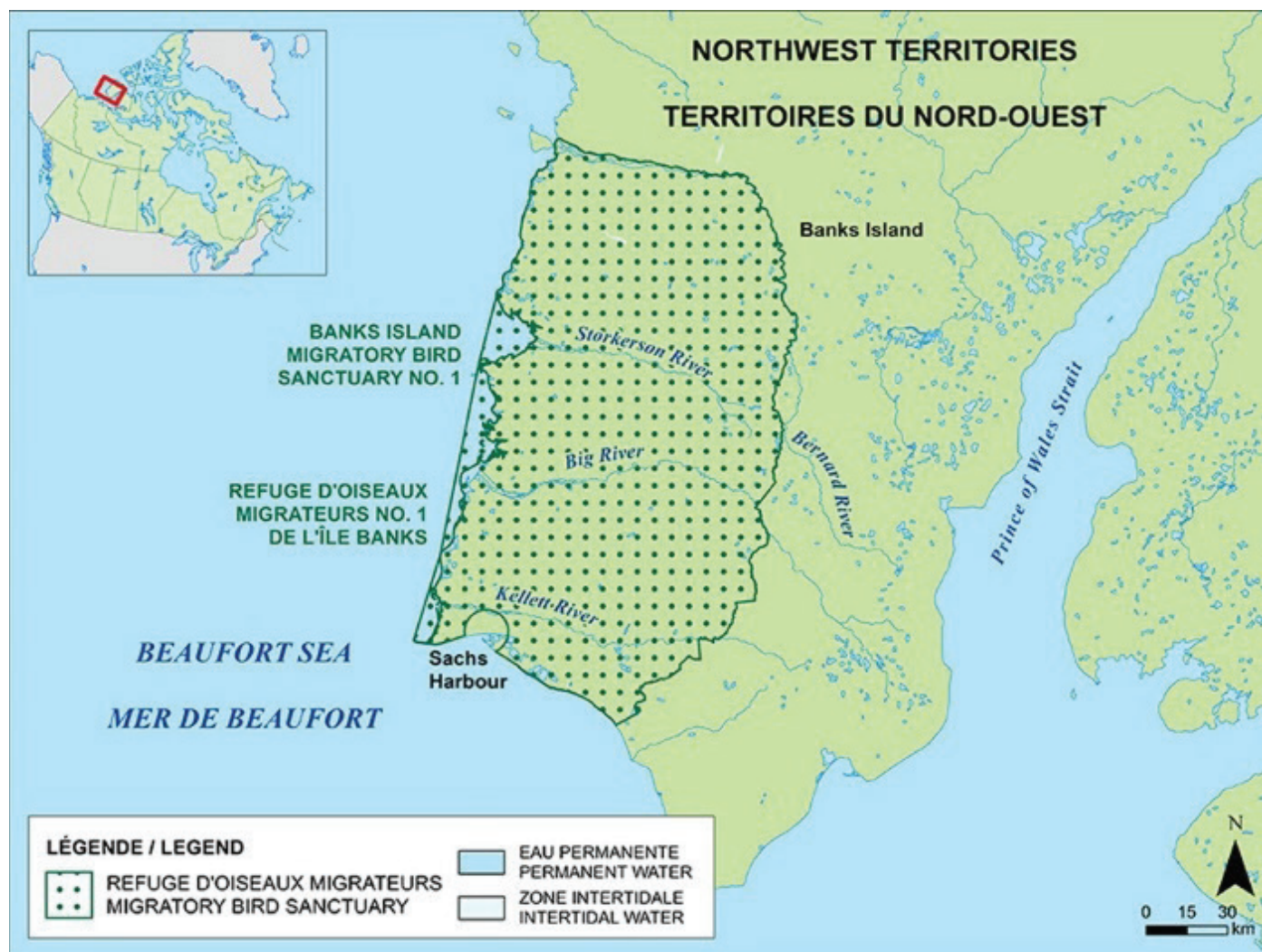


Figure 8. Map of Banks Island Migratory Bird Sanctuary No. 1<sup>475</sup>

474. Government of Canada, Banks Island Migratory Bird Sanctuary No. 1 (accessed online: <https://www.canada.ca/en/environment-climate-change/services/migratory-bird-sanctuaries/locations/banks-island-number-1.html>), November 22, 2022).

475. Ibid.

**Banks Island Migratory Bird Sanctuary No. 2:** Established in 1992, this MBS is located in the north-central portion of Banks Island, within the Aulavik National Park (see above) and tracks along the Thomson River (Figure 9). The vegetation is a mixture of high arctic and low arctic species with lush, grassy meadows growing in the low, wetland areas, dwarf shrubs and herbaceous plants on the surrounding moderately vegetated slopes and dwarf shrubs, cushion plants and lichens in the higher altitudes.<sup>476</sup>

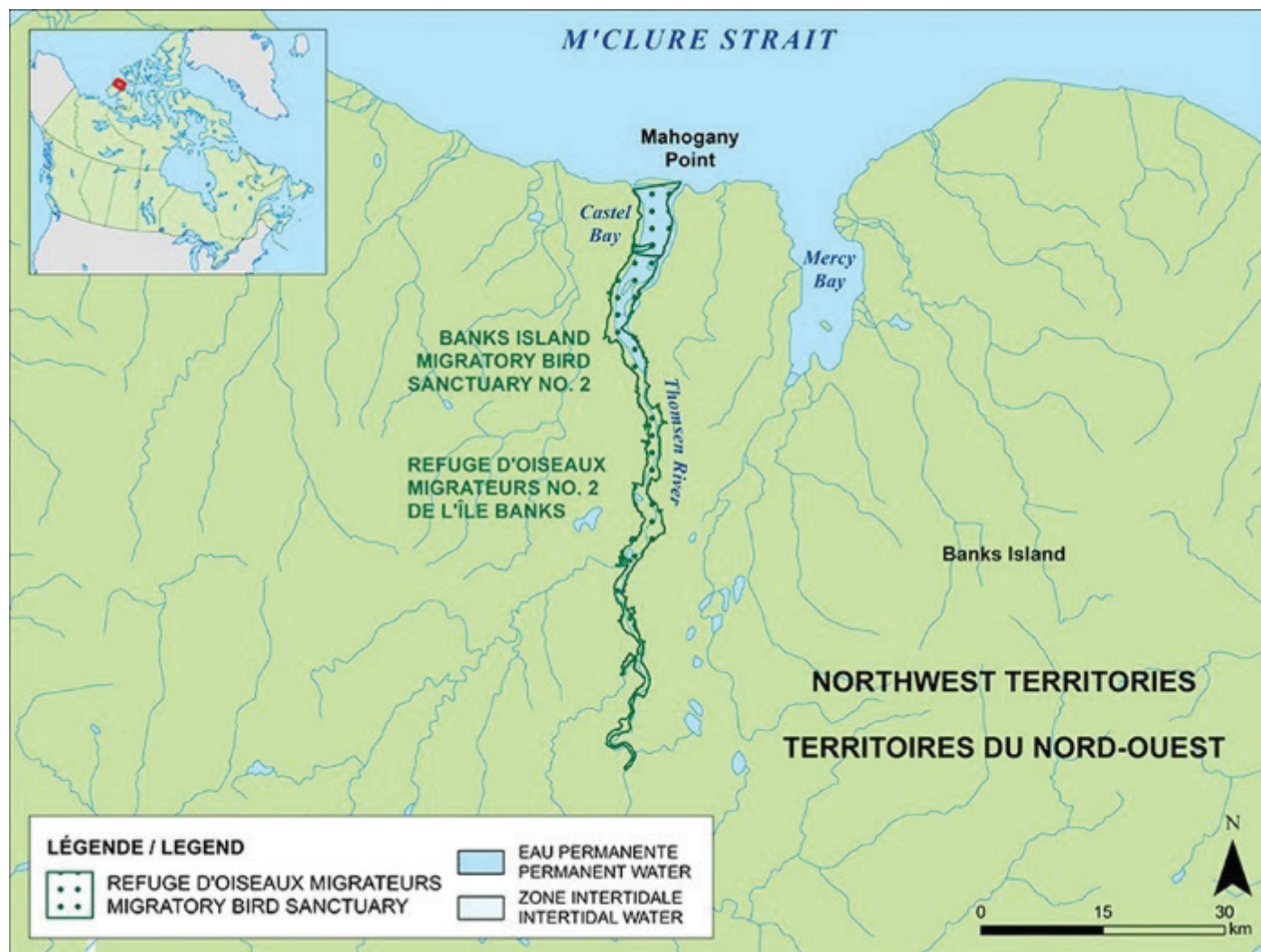


Figure 9. Map of Banks Island Migratory Bird Sanctuary No. 2<sup>477</sup>

476. Government of Canada, Banks Island Migratory Bird Sanctuary No. 2 (accessed online: <https://www.canada.ca/en/environment-climate-change/services/migratory-bird-sanctuaries/locations/banks-island-number-2.html>, November 22, 2022).

477. Ibid.

**Cape Parry Migratory Bird Sanctuary:** This MBS was established in 1961 and is located approximately 100 kilometres north of Paulatuk at the northern extremity of the Parry (Figure 10). Forbs, grasses, sedges and lichens are also abundant, while mosses are present but restricted to poorly drained areas. Much of the sanctuary has less than 25% plant cover, due to the high lime (calcium carbonate) content of the soils.<sup>478</sup>

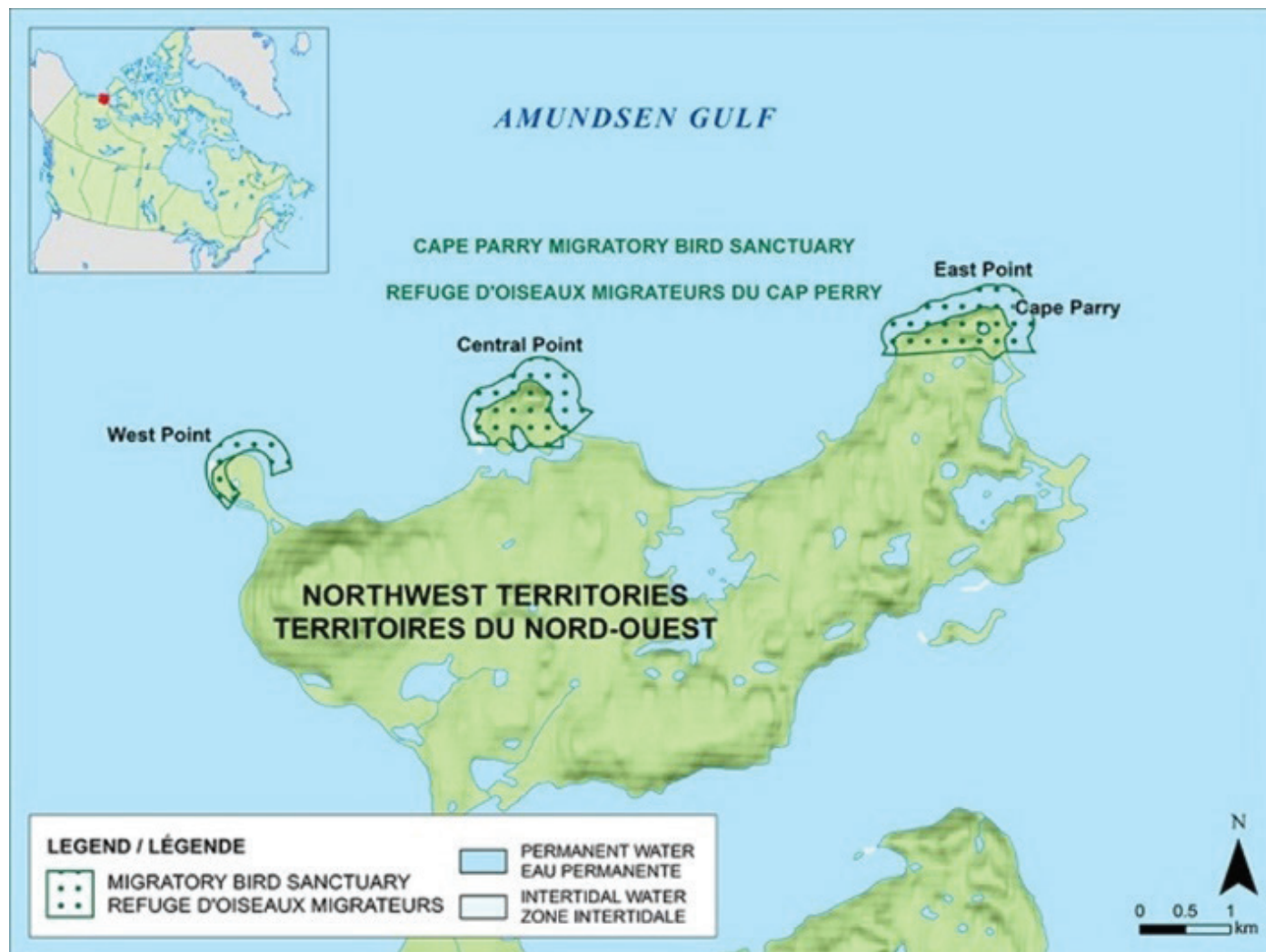


Figure 10. Map of Cape Parry Migratory Bird Sanctuary<sup>479</sup>

478. Government of Canada, Cape Parry Migratory Bird Sanctuary (accessed online: <https://www.canada.ca/en/environment-climate-change/services/migratory-bird-sanctuaries/locations/cape-parry.html>, November 22, 2022).

479. *Ibid.*



**Kendall Island Migratory Bird Sanctuary:** This MBS was established in 1961 and is located 120 kilometres west of Tuktoyaktuk, 140 kilometres north of Inuvik on the outer Mackenzie Delta (Figure 11). While the tidal range in this area is small, variations of up to two metres are reported to occur due to winds and storms. These high waters can reverse the flow on some of the smaller channels and cause considerable flooding inland.<sup>480</sup>

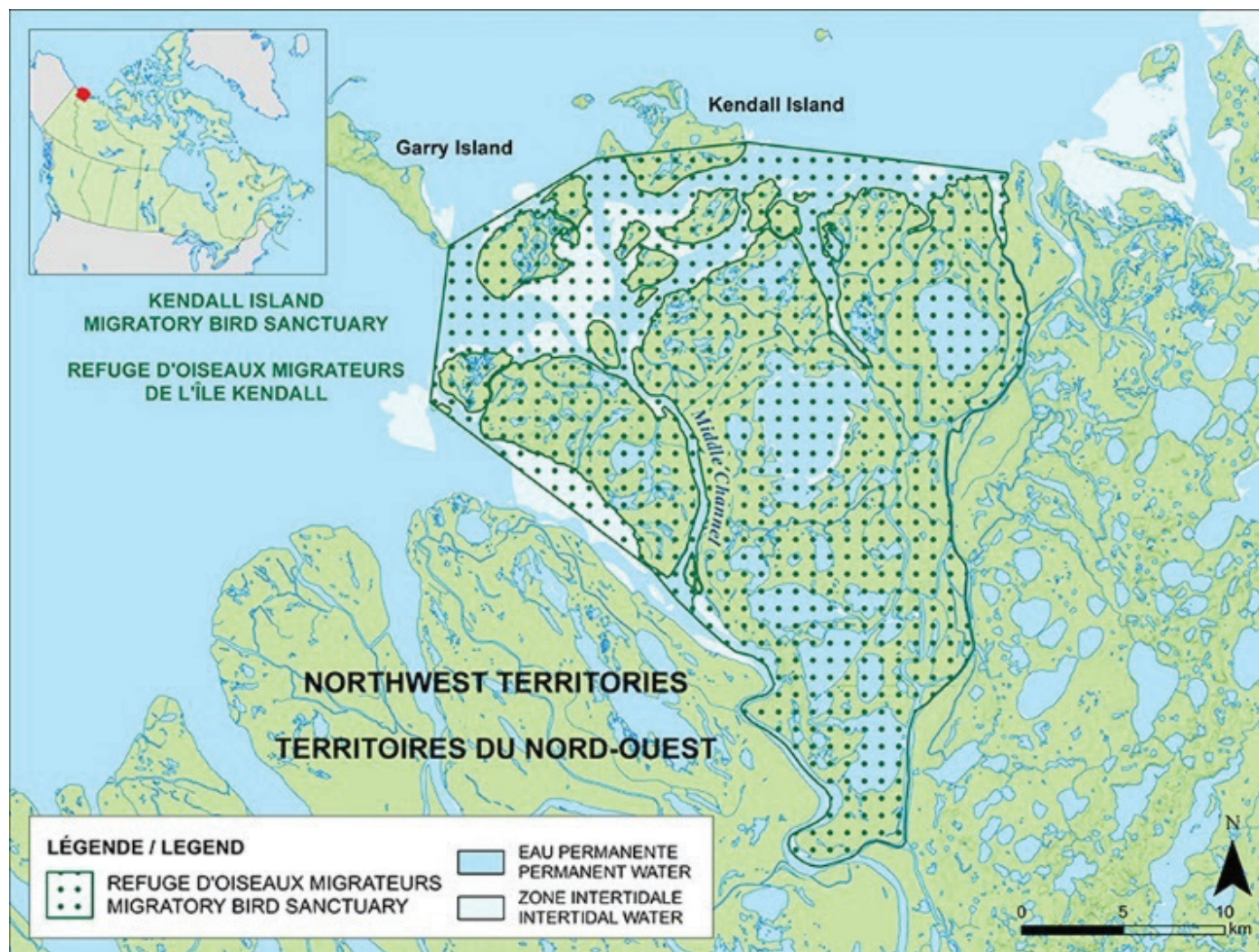


Figure 11. Map of Kendall Island Migratory Bird Sanctuary<sup>481</sup>

480. Government of Canada, Kendall Island Migratory Bird Sanctuary (accessed online: <https://www.canada.ca/en/environment-climate-change/services/migratory-bird-sanctuaries/locations/kendall-island.html>, November 22, 2022).

481. *Ibid.*

## 6.2 NORTHWEST TERRITORIES POLICY MEASURES

### STATEMENT OF ENVIRONMENTAL VALUES<sup>482</sup>

As noted above, the *NWT ERA* requires the development and publication of a Statement of Environmental Values. Under the SEV, the GNWT “recognizes that environmental considerations, including the right to a healthy environment, should be integrated into all decisions and actions that may have significant impacts on the environment. The GNWT commits to carrying out its responsibility in such a manner to protect the environmental rights of the people of the Northwest Territories (NWT), recognizing residents possess a unique relationship to the land, the rich, vast diversity of which has shaped their values and experiences”.<sup>483</sup> The SEV incorporates the principles enunciated in the *NWT ERA*, including those identified above to have a bearing on blue carbon ecosystems (precautionary, polluter pay, intergenerational equity and ecological sustainability).

The SEV also makes the GNWT accountable for its implementation, e.g., “Ministers shall take reasonable measures to ensure departments adhere to the principles and provisions set out in this Statement, and to collaborate with applicable agencies to encourage adherence to the principles and provisions set out in this Statement, when making decisions that might significantly affect the environment”.<sup>484</sup> With respect to legislation and policy, “the GNWT will ensure the integration of environmental considerations into legislative and policy proposals and related legislation and policy development”.<sup>485</sup>

These are high-level commitments, which do not directly target blue carbon ecosystems. However, upholding these principles for decision-making in coastal areas would be pretty helpful. Such decision-making can be evaluated against this SEV in advocacy efforts.

### LAND USE PLANNING, PROTECTED AND CONSERVED AREAS

PLEASE NOTE: This section does not discuss Inuvialuit Community Conservation Plans established pursuant to the IFA. These would be discussed in a Phase 2 of this Discussion Paper.

Overall, it appears that the GNWT is in a land use planning renewal period.

The *Northern Lands Northern Leadership: The GNWT Land Use and Sustainability Framework* (2014)<sup>486</sup> is a high-level vision document generally addresses balancing economic, environmental, cultural and social interests. This document is organized around a human-centred sustainability conception: “Land use is sustainable if it meets present needs without compromising the ability of future generations to meet their own needs. Land use is sustainable if it has a capacity to ensure that current and future economic, social and cultural needs are met. Land use is sustainable if it maintains ecosystem integrity and biological diversity”.<sup>487</sup> There are no references to marine coasts, plants, habitat or any other Key Blue Carbon Concepts.

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482. Government of the Northwest Territories, *Statement of Environmental Values* (adopted June 7, 2022) (accessed online: [https://www.enr.gov.nt.ca/sites/enr/files/resources/statement\\_of\\_environmental\\_values\\_final.pdf](https://www.enr.gov.nt.ca/sites/enr/files/resources/statement_of_environmental_values_final.pdf), November 22, 2022).

483. *Statement of Environmental Values*, s. 2.

484. *Statement of Environmental Values*, s. 3.

485. *Statement of Environmental Values*, s. 4(3).

486. GNWT, *Land Use and Sustainability Framework* (accessed online: [https://www.lands.gov.nt.ca/sites/lands/files/resources/land\\_use\\_and\\_sustainability\\_framework\\_updated\\_email.pdf](https://www.lands.gov.nt.ca/sites/lands/files/resources/land_use_and_sustainability_framework_updated_email.pdf)).

487. GNWT, *Northern Lands Northern Leadership: The GNWT Land Use and Sustainability Framework* (2014) (accessed online: [https://www.lands.gov.nt.ca/sites/lands/files/resources/land\\_use\\_and\\_sustainability\\_framework\\_updated\\_email.pdf](https://www.lands.gov.nt.ca/sites/lands/files/resources/land_use_and_sustainability_framework_updated_email.pdf), November 22, 2022), p. 2.

A second document, *Healthy Land, Healthy People: GNWT Priorities for Advancement of Conservation Network Planning 2016-2021*<sup>488</sup> outlines two goals:

- Conclude the planning and decision-making processes for each of the existing candidate areas.
- Develop a renewed strategy for conservation network planning in partnership with Aboriginal governments and other partners.

This document indicates that the GNWT will pursue a renewed strategy to advance a made-in-the-north approach to conservation network planning. The strategy will be based on the principles of the Northern Lands Northern Leadership - The GNWT Land Use and Sustainability Framework (LUSF)<sup>489</sup> and upon the *NWT Protected Areas Strategy* (1999).<sup>490</sup>

As with most northern policy development, there are opportunities for stakeholders to engage and provide input. As these new frameworks develop, it may be an opportune time to incorporate blue carbon concepts, which have been largely invisible to date in the law and policy environments.

### ***NWT BIODIVERSITY ACTION PLAN - MAJOR INITIATIVES ON BIODIVERSITY (2004, 2006)***

GNWT's Environment and Natural Resources Department explains that the first NWT Biodiversity Action Plan was released in 2004. This 2004 Action Plan<sup>491</sup> describes initiatives underway in the NWT that support Biodiversity Goals. The second NWT Biodiversity Action Plan was released in 2006. This 2006 Action Plan<sup>492</sup> presents a gap and overlap analysis for NWT actions and recommendations for future NWT actions to fill gaps and increase cooperation. WWF-Canada was among the members of the NWT Biodiversity Team that contributed to these very thorough Plans.

From a blue carbon sequestration perspective, a key takeaway from the 2004 Action Plan is perhaps the foresight that did not seem to be followed. Goal IV spoke specifically to Legislation on Oceans and Freshwater Management. The 2004 Action Plan explained: "An increased understanding of marine and freshwater ecosystems is imperative to fostering the sustainable development of freshwater bodies and oceans, and of their resources".<sup>493</sup>

A key takeaway from the 2006 Action Plan was that "there are many disjointed climate change programs in the NWT that need consolidation to move forward. We need to work more cooperatively on a territorial and national climate change agenda, which would include working with the federal government to control greenhouse gas emissions (GHG). Continuing research and implementation of carbon sequestration programs for forests, wetlands and grasslands is essential, as are examining climate change impact on biological resources and implementing strategies to reduce impacts.<sup>494</sup> Emphasis added]

Unfortunately, it does not appear that this advice merged with subsequent policy pieces as overtly.

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488. *Healthy Land, Healthy People: GNWT Priorities for Advancement of Conservation Network Planning 2016-2021* (accessed online: [https://www.enr.gov.nt.ca/sites/enr/files/hlhp\\_cnp\\_priorities\\_2016-2021.pdf](https://www.enr.gov.nt.ca/sites/enr/files/hlhp_cnp_priorities_2016-2021.pdf), November 22, 2022).

489. *Healthy Land, Healthy People*, p. 8.

490. *NWT Protected Areas Strategy, 1999*, (accessed online: [https://www.enr.gov.nt.ca/sites/enr/files/resources/pas\\_1999.pdf](https://www.enr.gov.nt.ca/sites/enr/files/resources/pas_1999.pdf), November 22, 2022).

491. NWT Biodiversity Team, *Major Initiatives on Biodiversity* (2004) (accessed online: [https://www.enr.gov.nt.ca/sites/enr/files/nwt\\_bap\\_report\\_1\\_complete.pdf](https://www.enr.gov.nt.ca/sites/enr/files/nwt_bap_report_1_complete.pdf), November 22, 2022).

492. NWT Biodiversity Team, *Northwest Territories Biodiversity Action Plan Report Two: Gap and Overlap Analysis and Recommendations for Future Actions* (2006) (accessed online: [https://www.enr.gov.nt.ca/sites/enr/files/biodiversity\\_action\\_plan\\_final.pdf](https://www.enr.gov.nt.ca/sites/enr/files/biodiversity_action_plan_final.pdf), November 22, 2022).

493. *Major Initiatives on Biodiversity*, p. 146-147.

494. 2006 Action Plan, p. 43.



## 2030 NWT CLIMATE CHANGE STRATEGIC FRAMEWORK & 2019-2023 CLIMATE CHANGE ACTION PLAN (2019)<sup>495</sup>

The *2019-2023 Action Plan* (Action Plan) is based on the *2030 NWT Climate Change Strategic Framework*. The Action Plan is intended to guide the implementation of the Framework over the first part its life. The GNWT has committed to developing a subsequent Action Plan in conjunction with partners, to cover the period from 2025 to 2029, following a formal review in 2024.<sup>496</sup>

A few key goals relate, at least incidentally, to blue carbon sequestration:

- Goal #1: Transition to a lower carbon economy
- Goal #2: Improve knowledge of climate change impacts
- Goal #3: Build resilience and adapt to a changing climate<sup>497</sup>

Water and wetlands are identified as an Action Area that requires research and monitoring to improve knowledge.<sup>498</sup> This includes a mapping project currently underway with Ducks Unlimited Canada. The following are also referenced in terms of areas of future collaboration:

- Review monitoring water and wetland networks to assess appropriateness for determining trends and/or impacts related to climate change
- Prioritize and enhance water monitoring networks to improve assessments of climate change impacts
- Undertake climate change vulnerability assessments on priority surface water bodies to inform management decisions
- Identify and assess use of innovative technology for the remote assessment of water, snow pack and ice to assess changes, including those related to a changing climate.

Significantly, the Action Plan identifies determining the potential value of natural carbon sinks and Undertaking work to estimate carbon stored in NWT ecosystems as both a Goal<sup>499</sup> and Action Item.<sup>500</sup> However, the only reference to sequestration potential in the NWT Climate Change Strategy relates to forests.

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495. GNWT, *2030 NWT Climate Change Strategic Framework & 2019-2023 Action Plan (2019)* (accessed online: [https://www.enr.gov.nt.ca/sites/enr/files/resources/128-climate\\_change\\_ap\\_proof.pdf](https://www.enr.gov.nt.ca/sites/enr/files/resources/128-climate_change_ap_proof.pdf), November 22, 2022).

496. *NWT Climate Change Action Plan*, p. 7.

497. *NWT Climate Change Action Plan*, p. 9.

498. *NWT Climate Change Action Plan*, p. 17.

499. *NWT Climate Change Action Plan*, p. 35.

500. *NWT Climate Change Action Plan*, p. 12.

## ***NWT STATE OF THE ENVIRONMENT REPORT***<sup>501</sup>

NWT State of the Environment Reports are released every four years. These Reports are organized around: “Driving Forces”, “Pressures”, “States” and “Stewardship”. Among other “States”, the 2022 SOE Report describes the state of land and ocean, water and vegetation. The Report mentions the two marine protected areas have been established in the coastal waters of the NWT (Tarium Niryutait and Anguniaqvia Niqiqyuam) as well as protection provided to other coastal waters as part of the Migratory Bird Sanctuaries.<sup>502</sup>

Somewhat surprisingly, however given the 2006 Action Plan recommendation noted above, carbon sequestration, wetland, marshland, tidal lands and/or mudflat services, and aquatic plants are absent. This appears to be either an area where data is simply not available, a major blind spot within the GNWT administration or a carve out due to offshore/onshore jurisdictional questions.

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501. Government of the Northwest Territories, *State of the Environment Report 2022*, TD 673-19(2), (accessed online: [https://www.enr.gov.nt.ca/sites/enr/files/resources/wt\\_state\\_of\\_the\\_environment\\_report\\_2022.pdf](https://www.enr.gov.nt.ca/sites/enr/files/resources/wt_state_of_the_environment_report_2022.pdf), December 31, 2022).

502. *State of the Environment Report 2022*, p.31.

# PART 7: NUNAVUT LAWS & POLICIES

This section queries the legislative and policy tools specific to Nunavut that may relate to the protection and/or restoration Arctic coastal blue carbon ecosystems found there. This Part includes territorial source law and policy as well as federal laws that apply uniquely to this territory.

As with all of the Parts of this Discussion Paper, the mainland coast and arctic island coasts are subject to underlying Inuit rights. The Nunavut Land Claims Agreement (Nunavut Agreement) was signed on May 25, 1993<sup>503</sup> and brought into Canadian law through the *Nunavut Land Claims Agreement Act*, assented to on June 9, 1993.<sup>504</sup> The governance and regulatory structures under the Nunavut Agreement will be analysed in greater detail in Phase 2 of the Discussion Paper.

Also similar to other Parts of this Discussion Paper, it is important to acknowledge that as a territory, Nunavut is on different legal footing than the provincial jurisdictions reviewed in other Discussion Papers. Nunavut is a creature of federal statute with powers delegated to it by federal Parliament rather than the *Constitution Act, 1867*. It exercises administration and control in ways similar to but not exactly the same as provinces or even other territories. As the purpose of this Discussion Paper is to bring existing legislation and policy that is relevant to blue carbon ecosystems to the fore, the analysis will not dive deeply into the Constitutional underpinnings except insofar as rights under s. 35 of the *Constitution Act, 1982* are concerned.

A final organizing note, an effort has been made in this Discussion Paper to show every potentially relevant statute and policy document so that as this dialogue is continued, this work does not need to be redone. While the documents listed here have been reviewed in the hopes of finding blue carbon sequestration protections or *potential* protections, some of these just do not have much to recommend. In those cases, this Discussion Paper will indicate: “No references were found to Key Blue Carbon Concepts”. These Concepts include: plants, seaweed, algae, eelgrass, habitat, wetlands, marsh, mudflats, tidal, nearshore, climate, carbon, sequestration, dredging, etc.

## 8.1 NUNAVUT STATUTES AND REGULATIONS

### NUNAVUT ACT (CANADA)<sup>505</sup>

The Nunavut Act is a federal statute, which sets out, among other things, the structure of the Nunavut Government and law-making powers of the Legislature. The establishment of Nunavut satisfied Canada’s commitment under the Nunavut Agreement to establish a public government for the new territory.

The boundaries of Nunavut are defined as follows: “all that part of Canada north of the sixtieth parallel of north latitude and east of the boundary described in Schedule I that is not within Quebec or Newfoundland and Labrador; and the islands in Hudson Bay, James Bay and Ungava Bay that are not within Manitoba, Ontario or Quebec”.<sup>506</sup> According to Environment and Climate Change Canada, *all* of the islands in Hudson and James Bay are within the jurisdiction of Nunavut.<sup>507</sup> Similar to NWT, the boundaries of Nunavut stretch to the maritime limits of Canada’s jurisdiction.

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503. *Nunavut Agreement* (1993), as amended.

504. *Nunavut Land Claims Agreement Act*, S.C. 1993, c. 29.

505. *Nunavut Act* S.C. 1993, c. 28.

506. *Nunavut Act*, s. 3.

507. ECCC, Migratory Bird Sanctuaries (accessed online: <https://www.canada.ca/en/environment-climate-change/services/migratory-bird-sanctuaries/locations/akimiski-island.html#toc2>, November 22, 2022).

Unlike Yukon and NWT, Nunavut has not yet finalized a devolution agreement with Canada (the Agreement in Principle is discussed below). As such, this Act has not yet been similarly amended to reflect a devolution of administration and control over lands and resources. Unlike GNWT and Yukon Government, the Government of Nunavut does not have same level of power to make laws relating to the conservation of wildlife and its habitat beyond the “preservation of game”, relating to waters or to non-renewable resources under its legislative power delegations in section 23(1) of the *Nunavut Act*.

Demonstrating this, public lands are defined as any land, and any interest in any land, in Nunavut that belongs to Her Majesty in right of Canada or of which the Government of Canada has power to dispose.<sup>508</sup> Further, “the following lands are and remain vested in Her Majesty in right of Canada: land acquired with funds of Nunavut; [...] public land, the administration and control of which has been transferred by the Governor in Council to the Commissioner of Nunavut; etc.”<sup>509</sup>

## **NUNAVUT LANDS AND RESOURCES DEVOLUTION AGREEMENT IN PRINCIPLE<sup>510</sup>**

Canada has explained the impetus behind and current status of devolution in Nunavut thus: “Northern governance and the transfer or devolution of responsibilities and powers to the territories is a long-standing policy objective of the Government of Canada. Devolution in Nunavut is an essential step in the political and economic development of the territory. The chief negotiators initialled a draft AIP in May 2019 and recommended it to their principles for signature. It will take approximately 5 years from signing the AIP to when all responsibilities are formally transferred to the Government of Nunavut”.<sup>511</sup>

The Agreement-in-Principle anticipates that the Devolution Agreement will “provide for the transfer to the Commissioner of administration and control of Public Lands and rights in respect of Waters”.<sup>512</sup> Waters is defined as “any inland waters on or below the surface of land Onshore, whether in a liquid or frozen state, except for waters or rights in respect of waters that are excluded from transfer pursuant to the Devolution Agreement”.<sup>513</sup> Specifically, the AIP commits Canada to amending the *Nunavut Act* to delegate legislative powers to the Government of Nunavut with respect to, *inter alia*, exploration, development and management of non-renewable resources as well as oil and gas pipelines in the onshore.<sup>514</sup> Onshore is defined as

“lands, including lands under water, that lie landward of the low water line (ordinary high water mark in respect of Settlement Lands) of the sea coast of the mainland or any naturally occurring permanent island in that part of Canada lying north of the sixtieth parallel of north latitude and east of the boundary described in Schedule I of the *Nunavut Act* (Canada) and not within any province; lands, including lands under water, that lie landward of the low water line (ordinary high water mark in respect of Settlement Lands) of the sea coast of the islands in Hudson Bay, James Bay or Ungava Bay that are not within any province; and lands under water within Small Enclosed Bays along the sea coast of the mainland or any naturally occurring permanent island in that part of Canada referred to in (i) and (ii), above”<sup>515</sup>.

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508. *Nunavut Act*, s. 2.

509. *Nunavut Act*, s. 49(1).

510. *Nunavut Lands and Resources Devolution Agreement in Principle* (August 15, 2019). [Nunavut AIP]

511. Government of Canada, *Nunavut Devolution* (accessed online: <https://www.rcaanc-cirnac.gc.ca/eng/1352471770723/1537900871295>, November 22, 2022).

512. Nunavut AIP, s. 5.2.

513. Nunavut AIP, s. 1.1.

514. Nunavut AIP, s. 5.6.

515. Nunavut AIP, s. 1.1.

Like in other jurisdictions, devolution in Nunavut will create jurisdictional bifurcation between the onshore and the offshore, which could require heightened collaboration in blue carbon ecosystem protection initiatives.

### **“NUNAVUT” FISHERIES REGULATIONS<sup>516</sup>**

Although the Nunavut Agreement came into effect in 1993 and Nunavut was established in 1999, Nunavut fisheries are still managed under the *Northwest Territories Fishery Regulations* (discussed above). New regulations are needed that are consistent with harvesting rights and wildlife management systems established under northern Land Claims Agreements, and to modernize governance structures that support implementation of Indigenous self-determination.

Nunavut Fishery Regulations are being co-developed by Fisheries and Oceans Canada, Nunavut Tunngavik Incorporated, Nunavut Wildlife Management Board, Government of Nunavut, and Makivik Corporation. The Regulations are proposed to apply to all fish (including marine mammals) as defined by the Fisheries Act, and currently includes the areas within the Nunavut Settlement Area (including the Areas of Equal Use and Occupancy) and the Nunavik Marine Region.<sup>517</sup>

Although this engagement process is now closed, this may present an opportunity to incorporate some of the holistic elements seen in the *Wildlife Act* to marine plants as vital blue carbon resources.

### **NUNAVUT ENVIRONMENTAL PROTECTION ACT<sup>518</sup>**

The *Nunavut Environmental Protection Act* is a territorial statute that was mirrored on a 1988 version of the NWT EPA and came into force upon creation of Nunavut on April 1, 1999. This Act applies to the “whole of Nunavut”.<sup>519</sup>

The *Nunavut EPA* prohibits the discharge of contaminants into the environment, subject to a list of exceptions.<sup>520</sup> The *Nunavut EPA* also authorizes the Minister to take a range of actions regarding the discharge of contaminants into the environment and develop, co-ordinate and administer regulations and policies relating to the preservation, protection or enhancement of the environment.<sup>521</sup> The Minister may delegate these functions to a Chief Environmental Protection Officer.<sup>522</sup>

Environment is defined broadly. The term means: “the components of the Earth and includes (a) air, land and water, (b) all layers of the atmosphere, (c) all organic and inorganic matter and living organisms, and (d) the interacting natural systems that include components referred to in paragraphs (a) to (c).”<sup>523</sup> Further, contaminant means any noise, heat, vibration or substance and includes such other substance as the Minister may prescribe that, where discharged into the environment, (a) endangers the health, safety or welfare of persons, (b) interferes or is likely to interfere with normal enjoyment of life or property, (c) endangers the health of animal life, or (d) causes or is likely to cause damage to plant life or to property.<sup>524</sup> The combined effect of these definitions is to encompass any blue carbon ecosystems within NU, arguably regardless of their onshore/offshore location.

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516. *Northwest Territories Fishery Regulations*, C.R.C., c. 847. [NWT Fishery Regulations]

517. Government of Canada, *Consultation on Nunavut Fishery Regulations* (accessed online: <https://www.dfo-mpo.gc.ca/fisheries-peches/consultation/nunavut-eng.html>, November 22, 2022).

518. *Nunavut Environmental Protection Act*, R.S.N.W.T. (Nu) 1988, c.E-7. [Nunavut EPA]

519. NU EPA, s. 2.

520. NU EPA, s. 5.

521. NU EPA, s. 2.2.

522. NU EPA, s. 3.

523. NU EPA, s. 1.

524. Nunavut EPA, s. 1.

Actions taken under this Act to deter the deposit deleterious substances into locales where blue carbon ecosystems might be found is a general support. However, the broad exemption authority and lack of any reference to blue carbon ecosystems as a valued component of the NWT environment weaken even this amount of protection. The Act does not directly reference Key Blue Carbon Concepts.

### **NUNAVUT ENVIRONMENTAL RIGHTS ACT<sup>525</sup>**

The *Nunavut Environmental Rights Act* is a territorial statute that was mirrored on a 1988 version of the NWT ERA and came into force upon creation of Nunavut on April 1, 1999. This Act applies to “the whole of the Territories (Territory)” and prevails to the extent of conflicts with other statutes.<sup>526</sup>

The *Nunavut ERA*, like the *NWT ERA* gives Nunavut residents standing to bring an action where they have reasonable grounds to believe the Act has been contravened.<sup>527</sup> Also like the *NWT NRA*, this Act defines environment broadly and includes in that definition all “components of the Earth within Nunavut and includes (a) all air, land, water, snow and ice, (b) all layers of the atmosphere, (c) all organic and inorganic matter and living organisms, and (d) the interacting natural systems that include those components. Also, public trust is defined as “the collective interest of the people of Nunavut in the quality of the environment and the protection of the environment for future generations”.<sup>528</sup>

Where these statutes diverge is in the definition of the right. In the *Nunavut ERA*, “every person resident in Nunavut has the right to protect the environment and the public trust from the release of contaminants by commencing an action in the Nunavut Court of Justice against any person releasing any contaminant into the environment.<sup>529</sup> This is much narrower than “has caused or is likely to cause significant harm to the environment”. As a result, this *Nunavut ERA* is of limited application in blue carbon ecosystem protection.

### **NUNAVUT TERRITORIAL PARKS ACT<sup>530</sup> AND NUNAVUT TERRITORIAL PARKS REGULATIONS<sup>531</sup>**

\*PLEASE NOTE: This section does not address Inuit Impact and Benefit Agreement and other requirements under the Nunavut Agreement in relation to the establishment of national or territorial parks. These, including Umbrella Inuit Impact and Benefits Agreement (IIBA) for territorial parks would be addressed in Phase 2 of the Report.

The *Nunavut Territorial Parks Act* is a territorial statute that was mirrored on a 1988 version of the NWT ERA and came into force upon creation of Nunavut on April 1, 1999.

The Act authorizes the Minister to establish Territorial Parks according to one of the following classifications: Natural Environment Recreation Parks; Outdoor Recreation Parks; Community Parks; Wayside Parks; Historic Parks.<sup>532</sup> While still centered on human experience, most relevant to blue carbon ecosystem protection, are likely Natural Environment Recreation Parks, which are designed to preserve the natural environment in those parks for the benefit, education and enjoyment of the public.

Territorial Parks in Nunavut are subject to the following general prohibitions subject only to an Act of Canada: establish, engage in or conduct a business, commercial enterprise or industrial activity, acquire a surface right

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525. *Nunavut Environmental Rights Act*, S.Nu. 2010,c.4,s.21. [Nunavut ERA]

526. *Nunavut ERA*, s.2.

527. *Nunavut ERA*, s. 5.

528. *Nunavut ERA*, s.1.

529. *Nunavut ERA*, s. 6.

530. *Territorial Parks Act*, R.S.N.W.T. (Nu) 1988,c.T-4. [Nunavut TPA]

531. *Nunavut Territorial Parks Regulations*, R.R.N.W.T. (Nu)1990,c.T-13. [Nunavut TPR]

532. *Nunavut TPA*, s. 3.



or the right to use or occupy the surface of any land, hunt or molest game or a game bird or migratory game bird, have in his or her possession or explode or discharge an explosive device, firearm, spring gun, bow or device that fires or propels projectiles, or construct, alter or move a building, structure, fixture, sign or means of access".<sup>533</sup> Subject to regulations, "no person shall damage or destroy a natural feature, or damage or remove a building, furnishing or equipment; deposit or leave garbage, sewage, refuse or any noxious material; have in his or her possession an animal unless the animal is on a leash or under his or her direct physical control; permit horses or other domesticated livestock to roam at large; or operate a motor vehicle, except in an area designated for that purpose."<sup>534</sup>

The *Territorial Parks Regulations* further state that "no person shall, in a Territorial Park, deposit or leave garbage, sewage, bottles, cans, paper, plastic containers or other litter, waste or obnoxious material in a place other than in a receptacle or pit provided for that purpose".<sup>535</sup> Further, no person shall launch a boat in a Territorial Park unless it is launched from an area designated by signs as a boat launching site.<sup>536</sup> Under these Regulations, the Superintendent may include in a park use permit terms and conditions respecting the protection of places of recreational, historical, geological, archaeological or scenic value;<sup>537</sup>

Several Community and Historic Parks are established or continued under the Nunavut TPA via Ministerial Order.<sup>538</sup> According to Nunavut Parks, several "attractions" are in the feasibility study phase for communities across Nunavut.<sup>539</sup> Beyond establishing authorities for area-based protections, the Nunavut TPA and the TP Regulations does not specifically address factors that may threaten blue carbon ecosystems or reference Key Blue Carbon Concepts.

## **NUNAVUT WILDLIFE ACT<sup>540</sup>**

\*PLEASE NOTE: While this Act is design to cohere with the *Nunavut Agreement*, this section does not address the fulsome and robust wildlife regulatory framework established under the *Nunavut Agreement*. This framework, including co-management structures would be addressed in Phase 2 of the Report.

The *Nunavut Wildlife Act* is a territorial statute enacted in 2003. It applies throughout Nunavut<sup>541</sup> to all terrestrial, aquatic, avian and amphibian flora and fauna that are wild by nature or wild by disposition; all parts and products from wildlife – including flora – and all habitat of wildlife. However, this Act does not apply to a marine plant, as defined in section 47 of the *Fisheries Act* (all benthic and detached algae, marine flowering plants, brown algae, red algae, green algae and phytoplankton). As such, if all species that constitute blue carbon ecosystems fall within the marine plant category, the protections afforded under this Act are will only be accessible, through the habitat service blue carbon ecosystems provide.

Having said that, habitat plays a central role under the *Nunavut Wildlife Act* as demonstrated in its purpose, which is "to establish a comprehensive regime for the management of wildlife and habitat in Nunavut, including the conservation, protection and recovery of species at risk, in a manner that implements provisions of the Nunavut Land Claims Agreement respecting wildlife, habitat and the rights of Inuit in relation to wildlife and

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533. *Nunavut TPA*, s. 12.

534. *Territorial Parks Act*, s. 13.

535. *Nunavut TPR*, s. 4.

536. *Nunavut TPR*, s. 8.

537. *Nunavut TPR*, s. 16.

538. *Community Parks Order*, NWT Reg (Nu) 103-95; R-103-95 and *Historical Parks Order*, NWT Reg (Nu) 054-95.

539. Nunavut Parks, *Park Planning* (accessed online: <https://nunavutparks.com/park-planning/>, November 22, 2022).

540. *Nunavut Wildlife Act*, S.Nu. 2003,c.26

541. *Nunavut Wildlife Act*, s. 6.

habitat”.<sup>542</sup> Significantly, habitat is to be recognized as intrinsically valuable and worth more than just the benefits derived from harvesting and commercial activities.<sup>543</sup> Finally, useful conservation principles apply under this Act, including, the maintenance of the natural balance of ecological systems, the protection of habitat, and the restoration and revitalization of depleted populations of wildlife and their habitat.<sup>544</sup>

The *Nunavut Wildlife Act* outlines a range of specific habitat protections that restrict activities in accordance with regulations, prohibit alteration, damage or destruction to any habitat, and, strictly limit activities such as exploration, development, construction, waste disposal and using motorized equipment in critical habitats.<sup>545</sup> Further, the Superintendent must prepare a policy for the recovery of each endangered or threatened species, identifying habitat that remains unprotected, and submit it to the NWMB for approval.<sup>546</sup>

The Commissioner in Executive Council may, by regulation, designate specific physical areas or landforms as critical habitat and wildlife sanctuaries (thus affording them the extra protections noted above)<sup>547</sup> or as a special management area where (a) it is necessary to implement an accepted decision of the NWMB; or (b) the Minister considers it necessary or advisable in respect of those matters within the jurisdiction of the Government of Nunavut where certain conditions are met.<sup>548</sup>

While the provisions of this Act (for marine plants, at least) are only accessible through wildlife species, once the habitat link is established, the protections are relatively strong.

### **NUNAVUT CONSERVATION AREAS REGULATIONS**<sup>549</sup>

The Nunavut Conservation Area Regulations are territorial regulations enabled pursuant to the *Nunavut Wildlife Act*. These were registered in 2015.

These Regulations serve to continue certain Conservation Areas that may host blue carbon ecosystems. These include but are not limited to the Bowman Bay Wildlife Sanctuary (a tidal area on western Baffin Island), Thelon Wildlife Sanctuary (inland bordering NWT and Nunavut) and Twin Islands Wildlife Sanctuary (central James Bay, approximately 70 kilometres west of mainland Quebec).<sup>550</sup> These Regulations also continue certain Special Management Areas established under the *Wildlife Act*, including the James Bay Special Management Area and several calving areas.

Where blue carbon ecosystems overlap with these areas – and perhaps form part of the habitat – they will receive the habitat-specific protections for critical habitat under the Act.

### **NUNAVUT LAND USE PLANNING**

As noted above, an analysis of the regulatory frameworks established under modern treaties across Inuit Nunangat are beyond the scope of Phase 1 of this Discussion Paper. In Nunavut in particular, however, it is difficult to understand the land use planning context without at rough sketch of that framework.

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542. *Nunavut Wildlife Act*, s. 1.

543. *Nunavut Wildlife Act*, s. 1(2).

544. *Nunavut Wildlife Act*, s. 1(3).

545. *Nunavut Wildlife Act*, s. 65.

546. *Nunavut Wildlife Act*, s. 134.

547. *Nunavut Wildlife Act*, s. 139.

548. *Nunavut Wildlife Act*, s. 141.

549. *Nunavut Conservation Areas Regulations*, R-009-2015.

550. *Nunavut Conservation Areas Regulations*, s. 1-3.

Article 11 of the *Nunavut Agreement* provides the architecture for land use planning in the territory. Land includes water and wildlife across the arctic archipelago. This Article directs that a Nunavut Land Use Planning Commission, composed of members recommended by the federal and territorial governments and members nominated by the Designated Inuit Organization, at least half of whom must reside in Nunavut “shall be established”.<sup>551</sup> The Planning Commission is tasked with developing land use plans through a process of public hearings, drafting and revision for recommendation to the relevant Ministers.<sup>552</sup> Paragraph 11.2.1 lists the principles that the Planning Commission must follow in its work. That “people are a functional part of a dynamic biophysical environment and land use cannot be planned and managed without reference to the human community”; “the primary purpose of land use planning in the Nunavut Settlement Area shall be to protect and promote the existing and future well-being of those persons ordinarily resident and communities of the Nunavut Settlement Area taking into account the interests of all Canadians”; and, “plans shall provide for the conservation, development and utilization of land” are among the key principles might influence blue carbon sequestration efforts.<sup>553</sup>

The Planning Commission is also established and empowered by the *Nunavut Planning and Project Assessment Act*<sup>554</sup> (NUPPAA or Act). The NUPPAA is a federal statute enacted to implement aspects of the Nunavut Agreement. The Planning Commission is mandated to develop one or more land use plans for the Nunavut Settlement Area and the Outer Land Fast Ice Zone. The NUPPAA also stipulates a public-facing land use plan development process, provides for review and empowers the Planning Commission to evaluate and monitor projects against any land use plan that is developed. Ultimately, the Planning Commission must evaluate proposals for conformity with a Land Use Plan and monitor projects for compliance with a Land Use Plan.<sup>555</sup>

In 2007, and in line with the Nunavut Agreement and the NUPPAA, the Planning Commission established its *Broad Planning Policies, Objectives and Goals*. Its five goals are: 1. Strengthening Partnership and Institutions; 2. Protecting and Sustaining the Environment; 3. Encouraging Conservation Planning; 4. Building Healthier Communities; and, 5. Encouraging Sustainable Economic Development. [Emphasis added] The *Leading the Way through Land Use Planning: 2021 Draft Nunavut Land Use Plan* (Draft Land Use Plan, July 2021) builds on these goals.<sup>556</sup> While habitat is frequently referenced in these documents, plants are not often assigned value in terms of usefulness to humans or intrinsic value. Plants are considered from the perspective of their service as food, medicine, fuel and dye. Blue carbon and/or sequestration is not referenced anywhere in these documents or the LUP.

Due to its modern treaty foundation, the coverage of marine and terrestrial zones and lasting nature of the protections under the Nunavut Land Use Plan, this would be a key space for any initiatives to protect blue carbon ecosystems in Nunavut. Fortunately, it remains a work in progress.

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551. *Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada*, May 25, 1993, online: Government of Nunavut <[www.gov.nu.ca/sites/default/files/Nunavut\\_Land\\_Claims\\_Agreement.pdf](http://www.gov.nu.ca/sites/default/files/Nunavut_Land_Claims_Agreement.pdf)> [The Nunavut Agreement], para 11.4.1.

552. *Nunavut Agreement*, para 11.5.1 and 11.5.4.

553. *Nunavut Agreement*, para 11.2.1 (a)-(g).

554. *Nunavut Planning and Project Assessment Act* (NUPPAA) S.C. 2013, c. 14.

555. NUPPAA, s. 14(a.)

556. Nunavut Planning Commission, 2021 Draft Nunavut Land Use Plan (July 2021), online: <[https://www.nunavut.ca/sites/default/files/21-001e-2021-07-08-2021\\_draft\\_nunavut\\_land\\_use\\_plan-english\\_0.pdf](https://www.nunavut.ca/sites/default/files/21-001e-2021-07-08-2021_draft_nunavut_land_use_plan-english_0.pdf)>, p. 4.



2.2.1-2 Project proponents must cease all uses at those sites, except research and tourism related to caribou conservation, during the dates identified in Table 2: Caribou Seasonal Restrictions.<sup>558</sup>

Draft Land Use Plan Subparagraph 1.4.5.1 states that **Conditional Use Areas** are:

characterized by conformity requirements such as seasonal prohibitions on certain land uses, or setback requirements around important features. Conditional Use areas are shown on Map A (Land Use Designations). It should be noted that a failure by a project proponent to comply with the applicable conformity requirements of this Plan, which are copied into the proponent's licence, permit or other authorization as terms and conditions, constitutes an offence under paragraph 74(f) of the Nunavut Planning and Project Assessment Act.<sup>559</sup>

Such conformity requirements appear in the plan in association with specific areas. For example:

2.1-3 The Class 2 migratory bird habitat sites shown on Map A are Conditional Use areas within which all proponents must obey seasonal setbacks listed in Table 1: Migratory Bird Setbacks. [See Map A and Table 1 – Sites # 96-102]<sup>560</sup>

As the definitions suggest, LUAs are more restrictive than CUAs. LUAs situated as they are within the Draft Land Use Plan, which was prepared pursuant to the Nunavut Agreement and NUPPAA are effective mechanisms enabling the preventions of incompatible activities and manage all other activities within the area, such that the in-situ conservation of biodiversity can be achieved. CUAs are similarly situated and their associated conformity requirements are similarly regulated through Planning Commission oversight and penalty structures. However, a much broader range of human activity is permitted within those Areas making the management of "all other activities within the area" more difficult (recall that unless an activity is expressly prohibited, it is allowed). For example, mineral exploration and production is permitted Conditional Use areas, subject to any applicable conformity requirements, and is prohibited within certain Limited Use areas.<sup>561</sup> Further, linear infrastructure is permitted within all Conditional Use areas, subject to any applicable conformity requirements, and is prohibited within certain Limited Use areas.<sup>562</sup>

The prohibitions under LUA designations are year-round. However, some conformity requirements in Limited Use and Conditional Use areas do not apply year-round. According to the Draft Land Use Plan, wherever possible, these seasonal restrictions are based on seasonal cycles and systems that are relevant and therefore effective *in-situ*.<sup>563</sup> It appears that the timing of the conformity requirements reflect those times when they are effective in supporting, among other things Goal 2 of the Planning Commission: "Protecting and sustaining the environment", given the vast changes through the 6 seasons in Nunavut. CUAs, on the other hand, do not include the year-round standard and focus on conforming activities at certain times of the year in the interest of certain valued components. One example are requirements for work carried out in polar bear denning areas. Disruption of bear dens must be mitigated in accordance with the plan; but, blasting, grading, drilling and piling can still be done within a 1km radius as long as they have a monitor with them.<sup>564</sup> Appropriate expertise is needed to assess whether this is effective for the purposes of biodiversity conservation. Subject to better intelligence on this, the measure does not seem to have "biodiversity as a whole" as its objective. In this way, CUAs may not be managed in a way that achieves the conservation objectives or is likely to deliver the in-situ conservation of biodiversity.

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558. *Ibid.*, subparagraph 2.1.

559. *Ibid.*, subparagraph 1.4.5.2.

560. *Ibid.*, subparagraph 2.1.

561. *Ibid.*, subparagraph 5.4.

562. *Ibid.*, subparagraph 5.3.

563. *Ibid.*, subparagraph 1.4.6.

564. *Ibid.*, subparagraph 2.3.



Both LUAs and CUAs are embedded within the principles guiding the work of the Planning Commission outlined in Article 11 and the 5 Goals established by the Planning Commission for the Draft Land Use Plan. Goal 2 – *Protecting and Sustaining the Environment* acknowledges that protecting and conserving Nunavut’s air, land and water – i.e. the environment, including wildlife and wildlife habitat is critical to the sustainability of Nunavut’s communities and Inuit culture. Goal 3 – Encouraging conservation planning, indicates that protecting the natural environment and culturally significant areas will be achieved through, inter alia, protecting areas of interest under the authority of the Plan. These principles and goals are designed to achieve the well-being of current *and future* generations of people, who are acknowledged to be members of the dynamic ecosystem of Nunavut. The interdependence of humans and other biological resources is intrinsic to the worldview, which transcends from the constitutionally entrenched Nunavut Agreement through the NUPPAA, the Draft Land Use Plan and the land use designations.

Under NUPPAA, each federal or territorial minister, each department or agency and each municipality must, to the extent of their authority to do so, implement any land use plan that is in effect and carry out their activities in conformity with it.<sup>565</sup> Further, licenses, permits and other authorizations must impose the requirements of any applicable land use plan.<sup>566</sup> Breaches of a prohibition under NUPPAA s.74 is punishable on summary conviction and is liable to a fine of not more than \$100,000 or to imprisonment for a term of not more than one year, or to both.<sup>567</sup> An important layer of scrutiny, once a project is determined to be in compliance with a land use plan and not exempt from screening, the Nunavut Impact Review Board must exercise its powers to protect and promote the existing and future well-being of residents and communities and protect the ecosystemic integrity of the designated area.<sup>568</sup>

While sustainability of the environment in support of human flourishing now and in the future is the operating worldview, all elements of the land use planning framework recognize that this is a balancing exercise and choices need to be made. When looking generally at LUAs and CUAs, it seems that LUAs weigh on the conservation end of the spectrum while CUAs land on the managed human use end of the spectrum. Blue carbon ecosystems

## **NUNAVUT MIGRATORY BIRD SANCTUARIES (CANADA)**

There are eleven Migratory Bird Sanctuaries established or continued in Nunavut pursuant to the *Migratory Birds Convention Act*.<sup>569</sup> Akimiski Island MBS, Bylot Island MBS, Dewey Soper (Isulijarnik) MBS, East Bay (Qaqsauqtuuq) MBS, Harry Gibbons (Ikkattuaq) MBS, McConnell River (Kuugaarjuk) MBS, Prince Leopold Island MBS, Queen Maud Gulf (Ahiak) MBS, Seymour Island MBS. These MBS include marine areas and the aquatic plant species that grow in them.

As noted above, the *Migratory Bird Sanctuary Regulations* prohibit any activity that is harmful to migratory birds or the eggs, nests or habitat of migratory birds, except under authority of a permit.<sup>570</sup> The areas within these sanctuaries are protected by virtue of the protections afforded to the migratory birds that use those areas through the habitat services provided by blue carbon ecosystems. Notably, many of these areas the straddle terrestrial/marine divide, helping to organize around any jurisdictional bifurcations that affect other areas of coastline.

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565. NUPPAA, s. 68.

566. *Ibid.*, s. 69.

567. *Ibid.*, s. 219(1).

568. *Ibid.*, s. 23(1)(b).

569. *Migratory Birds Convention Act*, S.C. 1994, c. 22

570. MBCR, s. 10(1).



While the *Migratory Birds Convention Act* may not provide targeted protection to blue carbon ecosystems, these areas have been well-entrenched in federal law for a long time. The following two descriptions of coastal MBS are provided in an effort to paint a fuller picture of the conservation landscape in this vast region.

**The Bylot Island Migratory Bird Sanctuary:** This MBS is located off the coast of northeastern Baffin Island, Nunavut (Figure 13). ECCC explains that “The diversity of species that visit this sanctuary is mainly due to the juxtaposition of marine and terrestrial habitats, where the polynya and lead system develops yearly at the junction of Lancaster Sound and Baffin Bay.<sup>571</sup>

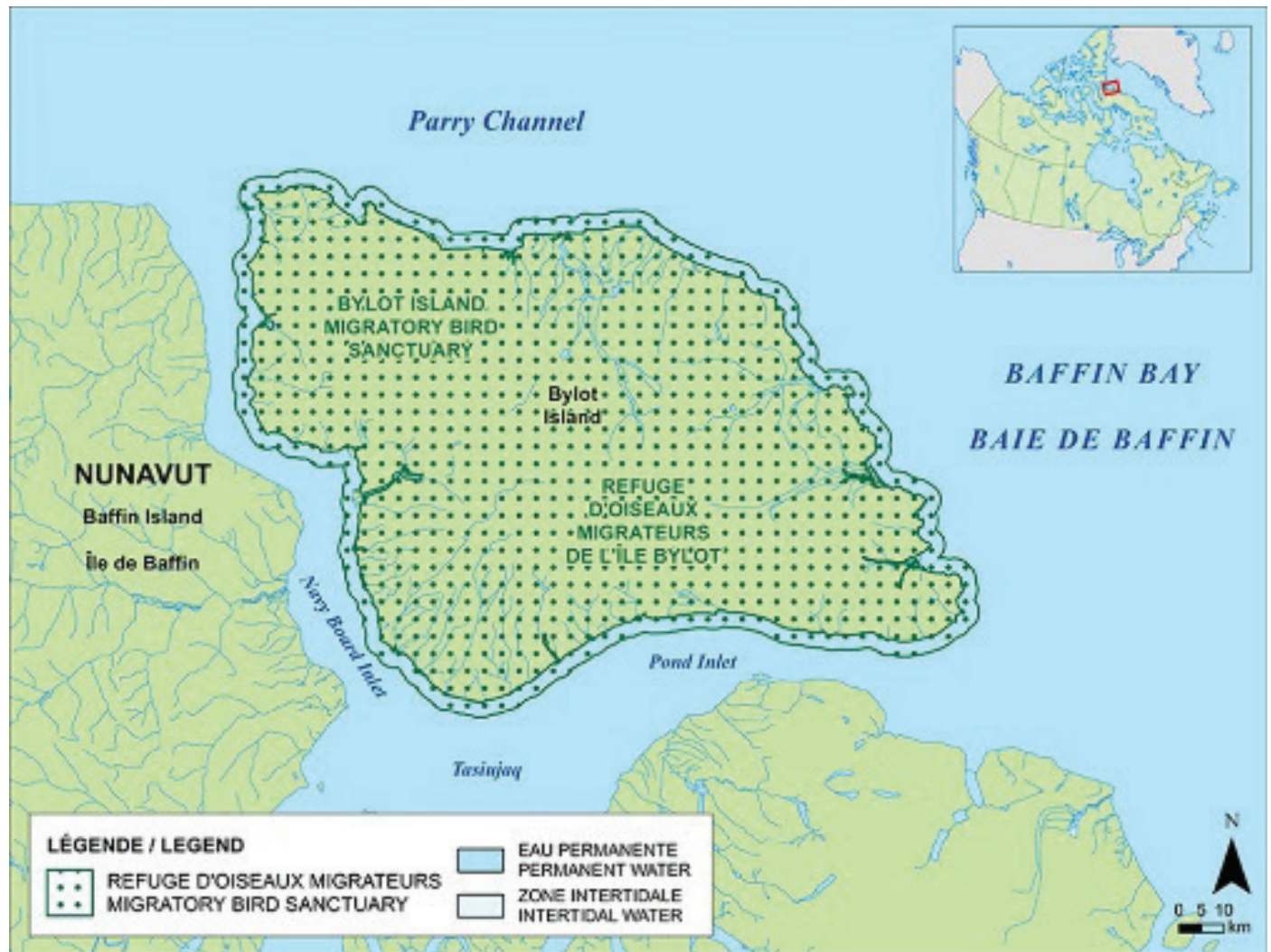


Figure 13. Map of Bylot Island Migratory Bird Sanctuary.<sup>572</sup>

571. ECCC, *Bylot Island MBS* (accessed online: <https://www.canada.ca/en/environment-climate-change/services/migratory-bird-sanctuaries/locations/bylot-island.html#toc1>, November 22, 2022).

572. ECCC, *Migratory Bird Sanctuaries - Bylot* (accessed online: <https://www.canada.ca/en/environment-climate-change/services/migratory-bird-sanctuaries/locations/bylot-island.html#toc1>, November 22, 2022).

**The Akimiski Island Migratory Bird Sanctuary:** Akimiski Island is the largest island in James Bay and is part of the territory of Nunavut (Figure 14). The closest community to the island is Attawapiskat, Ontario, located approximately 80 kilometres to the west. [...] This MBS covers roughly two thirds of the island and extends approximately 10 kilometres offshore. The island’s coastal marshes, which are interspersed with beach ridges, extensive mud flats and eelgrass beds make this sanctuary attractive to migratory birds during both spring and fall migrations, as well as during the breeding season.<sup>573</sup>

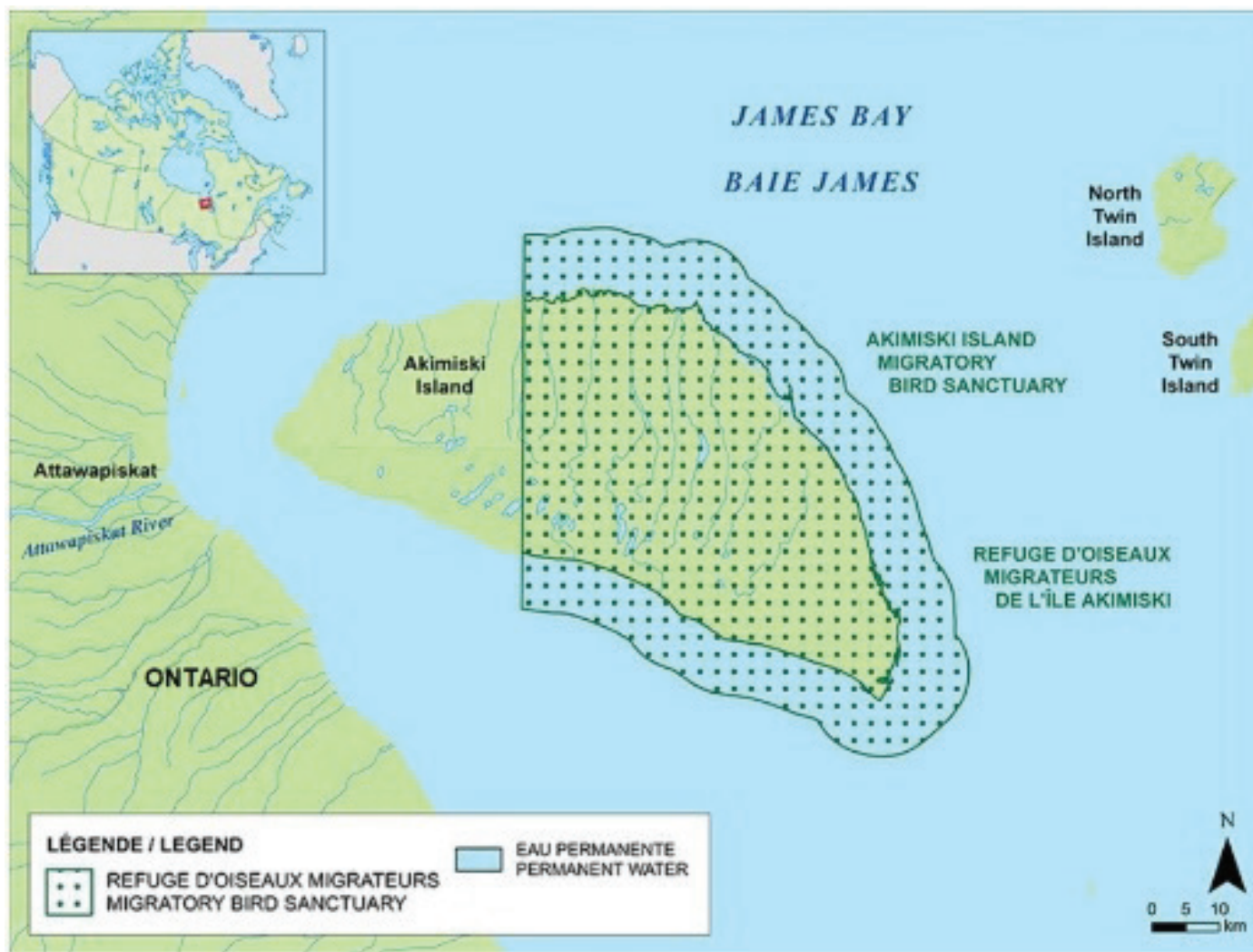


Figure 14. Map of Akimiski Island Migratory Bird Sanctuary<sup>574</sup>.

573. ECCC, Migratory Bird Sanctuaries - Akimiski (accessed online: <https://www.canada.ca/en/environment-climate-change/services/migratory-bird-sanctuaries/locations/akimiski-island.html#toc2>, November 22, 2022).

574. *Ibid.*

## TUVAIJUITTUQ MARINE PROTECTED AREA (TVMPA) (PROPOSED)

The TVMPA was designated for protection by Ministerial Order pursuant to the *Oceans Act* on July 30, 2019.<sup>575</sup> It is located in the waters off northern Ellesmere Island. The protections under the Order are broad and the exceptions are few. It prohibits any activity that disturbs, damages, destroys or removes from the Marine Protected Area any unique geological or archeological features or any living marine organism or any part of its habitat, or is likely to do so.<sup>576</sup> It does not, however, apply to Inuit harvesting rights under the Nunavut Agreement.<sup>577</sup>

Given the high latitudes of this MPA, the existence and productivity of blue carbon ecosystems may be limited.

## TALLURUPTIUP IMANGA NATIONAL MARINE CONSERVATION AREA

The Tallurutiup Imanga NMCA is an approximately 108,000 square kilometre area that has been proposed for the northeastern region of Nunavut pursuant to the *Nunavut Agreement* and the *National Marine Conservation Areas Act*.<sup>578</sup> In August 2019, the Government of Canada and the Qikiqtani Inuit Association signed the *Tallurutiup Imanga National Marine Conservation Area Inuit Impact and Benefit Agreement (IIBA)* which is a condition precedent to the operationalization of this NMCA. As an NMCA, this area would be protected in accordance with the provisions of the *National Marine Conservation Areas Act* discussed above and the IIBA.

The following map (Figure 15) shows the boundaries of the Tallurutiup Imanga NMCA and the exclusions from the area:

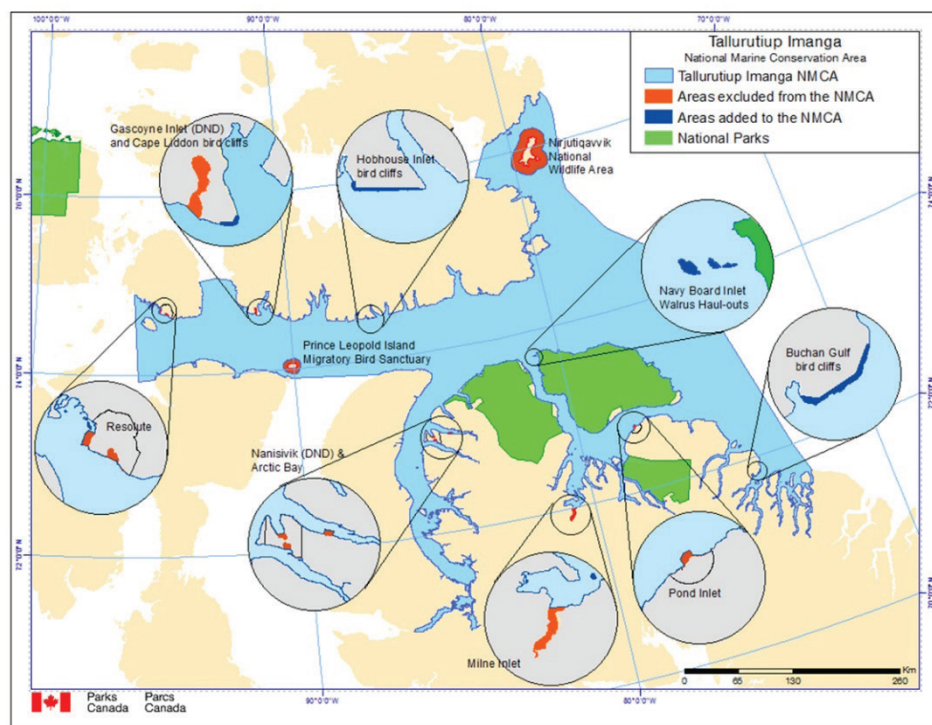


Figure 15. Map of Tallurutiup Imanga National Marine Conservation Area.<sup>579</sup>

575. Order Designating the Tuvaqjuittuq Marine Protected Area, SOR/2019-282. [Order 2019-282]

576. Order 2019-282, s. 4.

577. Order 2019-282, s. 5.

578. Canada National Marine Conservation Areas Act S.C. 2002, c. 18.

579. Parks Canada, *Tallurutiup Imanga National Marine Conservation Area Inuit Impact and Benefit Agreement* (accessed online: <https://parks.canada.ca/amnc-nmca/cnamnc-cnnmca/tallurutiup-imanga/entente-agreement>, November 22, 2022).



## PART 8: MANITOBA LAWS & POLICIES

This section sets out the legislative and policy tools specific to Manitoba that may relate to the protection and/or restoration of blue carbon ecosystems found along the coast of Hudson Bay. This Part includes provincial source law and policy as well as federal laws that apply uniquely to this province. For reference throughout this Part, it appears that the medium high-water mark sets the boundary between Manitoba's and Canada jurisdiction along the Hudson Bay coastline.<sup>580</sup> However, more recent analysis suggests that the starting position is that provinces extend to the ordinary low water mark, and that jurisdiction beyond that boundary vests in Canada.<sup>581</sup> In any event, efforts in Manitoba would likely be impacted by the same jurisdictional division that would be experienced in other provinces and territories.

As with all of the Parts of this Discussion Paper treaty rights – particularly those outlined in Treaty 5 and interpreted since – apply in this area. However, the terms of Treaty 5 as well as the governance structures employed by the Ojibwa and the Swampy Cree peoples of that region as they pertain to blue carbon sequestration initiatives will be analysed in greater detail in Phase 2 of the Discussion Paper.

As in previous Parts of this Discussion Paper a broad scope was applied to legislation and policy that could potentially assist in (or challenge) blue carbon ecosystem protection so this work does not need to be redone. While the documents listed here have been reviewed in the hopes of finding blue carbon sequestration protections or *potential* protections, there is a range of relevance. In some cases, this Discussion Paper will indicate: “No references were found to Key Blue Carbon Concepts”. These Concepts include: plants, seaweed, algae, eelgrass, habitat, wetlands, marsh, mudflats, tidal, nearshore, climate, carbon, sequestration, dredging, etc.

### 9.1 MANITOBA STATUTES AND REGULATIONS

#### MANITOBA FISHERY REGULATIONS (CANADA)<sup>582</sup>

The *Manitoba Fishery Regulations* are federal regulations enabled pursuant to the *Fisheries Act* and enacted in 1987, with amendments incorporated since then. These Regulations apply to the management and control of fisheries in Manitoba but do not apply in a National Park or to waters subject to a Fish Farming License.<sup>583</sup>

These Regulations address license issuance, recreational and commercial fishing, possession and transportation of fish and penalties. There are no references to habitat, marine areas or other Key Blue Carbon Concepts.

#### WAPUSK NATIONAL PARK (CANADA)

The Wapusk National Park (Figure 16) is established under the *National Parks Act* in 1996 and is listed in Schedule 1, Part 4 of that Act.<sup>584</sup> The area includes Hudson-James Bay Lowlands, which include poorly drained coastal plains with lakes, ponds, creeks and meandering rivers that cover half of the land's surface a vast, low-lying plain on the western shores of Hudson Bay. These lowlands contain the world's second largest contiguous wetland.

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580. B Neil Johannson, *An Examination of the Law of Water Boundaries and Accretions in Manitoba*, 1978, 8 Manitoba Law Journal 403, p. 404.

581. Brian Ballantyne, *Water boundaries on Canada Lands: that fuzzy shadowland*, 2016 (accessed online: <https://www.nrcan.gc.ca/sites/nrcan/files/earthsciences/pdf/Water-bounds-monograph-English-web.pdf>, November 22, 2022).

582. *Manitoba Fishery Regulations*, SOR/87-509.

583. *Manitoba Fishery Regulations*, s. 3(1).

584. *Canada National Parks Act*, Schedule 1, Part 4.

As can be seen from the map below, the park includes tidal flats, which, if climatic conditions are conducive, could encompass large areas of blue carbon ecosystems within the *National Parks Act* and *National Parks Regulations*.

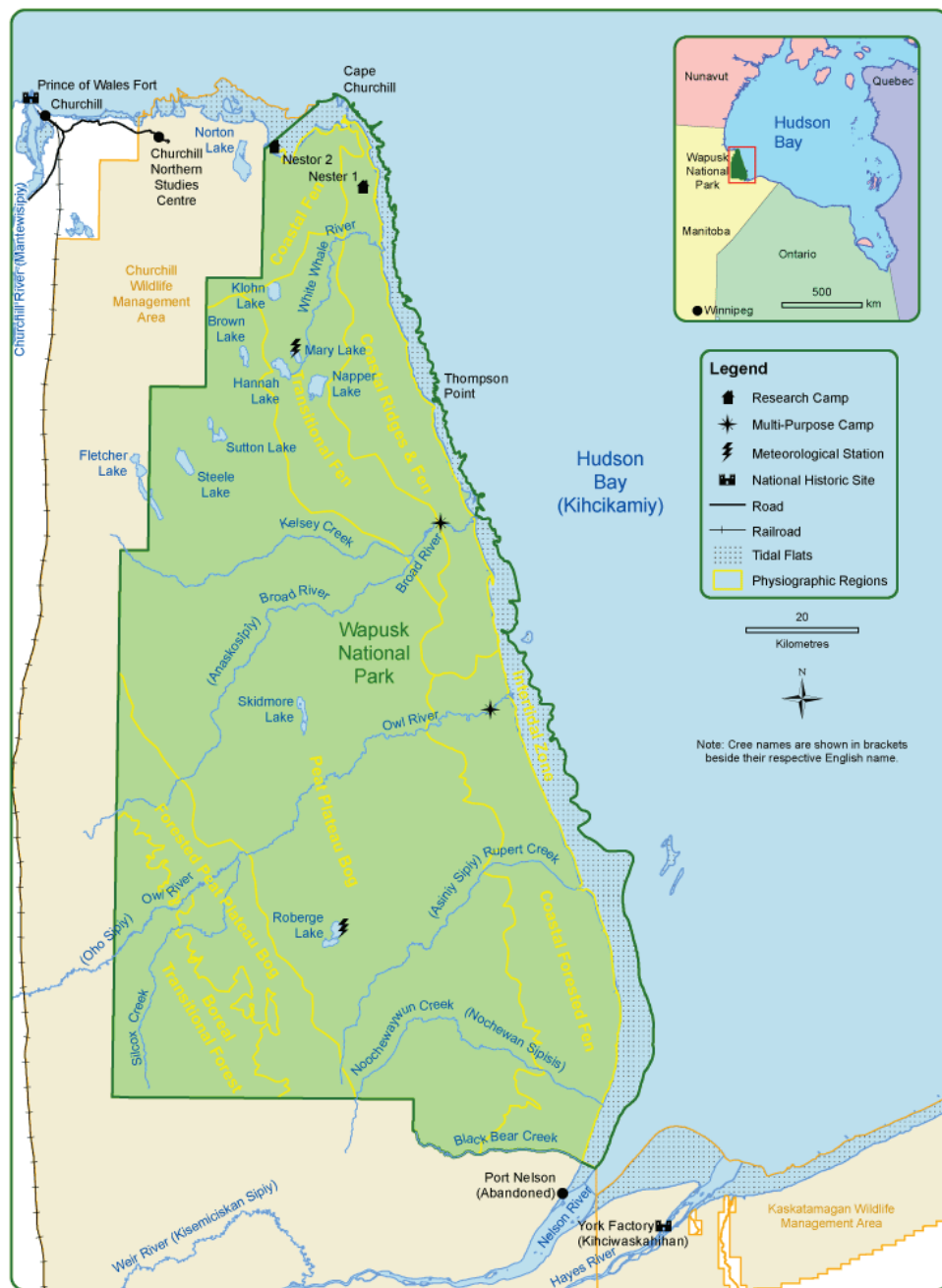


Figure 16. Map of Wapusk National Park<sup>585</sup>

585. Parks Canada, Map of Wapusk National Park (accessed online: <https://parks.canada.ca/pn-np/mb/wapusk/visit/carte-map/carte-map-03>, November 22, 2022).



## **MANITOBA FISHERIES ACT<sup>586</sup>**

The *Manitoba Fishers Act* is a provincial statute enacted in 1987 and amended several times since then. This Act applies to Manitoba waters, which is defined as “a wetland, a body of water or a portion of a body of water, the bed of which is owned by the Crown in right of Manitoba, or by a person who has entered into an agreement with the minister regarding the maintenance and enhancement of fish populations and the licensing of fishing in those waters”.<sup>587</sup> The presumption in the Act is that the bed of each wetland, body of water or portion of a body of water within Manitoba is owned by the Crown in right of Manitoba unless it forms part of an Indian reserve or a national park.<sup>588</sup> In short, this Act applies to waters inland from the Hudson Bay coast.

This Act deals largely with licensing and enforcement, quotas, marketing and possession of fish in the province. There are no references to habitat, marine areas or other Key Blue Carbon Concepts.

## **MANITOBA WILDLIFE ACT<sup>589</sup>**

The *Manitoba Wildlife Act* is a provincial statute enacted in 1987 and amended many times since then. The Act applies to all land within the province.

Key terms help define the scope of this Act as it pertains to blue carbon ecosystems. First, “wildlife” means a live or dead vertebrate animal of any species or type that is not a fish. Second, “habitat” means the soil, water, food and cover components of the natural environment that are necessary to sustain wildlife.<sup>590</sup> Like other wildlife statutes, the value of plant species is dependent on the wildlife species they support. As such, protections can only be accessed indirectly.

As a general prohibition, no person may destroy or damage habitat on Crown lands, except pursuant to a licence, permit or other authorization.<sup>591</sup>

Further, the Act establishes a land designation framework and process. Where the “Lieutenant Governor in Council is satisfied that the wildlife resource of the province would be better managed, conserved or enhanced, it may, by regulation, designate areas of the province in accordance with this section”.<sup>592</sup> The available designations include: wildlife management areas; registered trapline districts; special trapping areas; or any other type of area that the Lieutenant Governor in Council may specify.<sup>593</sup> Wildlife refuges<sup>594</sup> are another designation that might be used to protect, e.g., species that access the Hudson Bay coastline, and by extension, blue carbon ecosystems. Further regulations are required, however, to apply activity restrictions to the designated area. That authority includes making regulations respecting the use, control and management of an area; authorizing, regulating or prohibiting any use, activity or thing in an area; authorizing the construction, operation and maintenance of any building, structure or thing in a wildlife management area.<sup>595</sup>

Important for addressing interjurisdictional authorities along the coastline, the Act provides that Subject the Minister may enter into any agreement with the Government of Canada, the Government of a province or

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586. *Manitoba Fisheries Act*, RSM 1987, c. F90

587. *Manitoba Fisheries Act*, s. 14.1(1).

588. *Manitoba Fisheries Act*, s. 14.1(2).

589. *Manitoba Wildlife Act*, RSM 1987, c. W130.

590. *Manitoba Wildlife Act*, s. 1.

591. *Manitoba Wildlife Act*, s. 50(1).

592. *Manitoba Wildlife Act*, s. 2.

593. *Manitoba Wildlife Act*, s. 2(2).

594. *Manitoba Wildlife Act*, s. 2(3).

595. *Manitoba Wildlife Act*, s. 3(1).

territory of Canada, [...] for the joint management of wildlife [...]; the joint management of wildlife habitats; the development and implementation of joint programs for the control of damage caused by wildlife [...].<sup>596</sup>

While this Act is kingdom animalia-centric, its provisions are broad enough to include blue carbon ecosystems where a link with a species of wildlife can be established. It would require a great deal of legislative work, however, in the establishment of designated areas. Beyond habitat, the Act does not reference Key Blue Carbon Concepts.

### **MANITOBA ENVIRONMENT ACT<sup>597</sup>**

The *Manitoba Environment Act* is a provincial statute enacted in 1987 and amended many times since then. It applies throughout the province.

The intent and purpose of the Act is to develop and maintain an environmental protection and management system in Manitoba which will ensure that the environment is protected and maintained in such a manner as to sustain a high quality of life, including social and economic development, recreation and leisure for this and future generations. Like other environmental statutes, this Act governs how the “environment” is to be used or conserved, outlines what actions – in particular, releases – are prohibited and stipulates a role for the public in influencing these decisions.<sup>598</sup>

Key terms help define the scope of this Act as it pertains to blue carbon ecosystems. Here, “environment” is defined to include air, land, water, plant and animal life, including humans. Unlike other statutes, there is no express reference to systems involving these components, such as carbon sequestration. Water is defined to include “flowing or standing water on or below the surface of the earth, and ice formed thereon”.<sup>599</sup> This is not oriented toward marine or tidal waters but would include brackish areas, wetlands and marshlands.

Development activities are categorized according to classes with each class requiring a specific license type. Public hearings are a feature of these processes. Notably, in the Part of the Act that addresses environmental reviews, “when considering a proposal, the director or minister must take into account — in addition to other potential environmental impacts of the proposed development — the amount of greenhouse gases to be generated by the proposed development and the energy efficiency of the proposed development”.<sup>600</sup> Peat harvesting and water quality impacts are also listed as special considerations for the Minister.<sup>601</sup>

Beyond environment and water, the Act does not reference Key Blue Carbon Concepts.

### **MANITOBA PROVINCIAL PARKS ACT<sup>602</sup> AND MANITOBA PARK PARKS DESIGNATION REGULATION<sup>603</sup>**

The *Manitoba Provincial Parks Act* is a provincial statute that was enacted in 1996 and amended several times since then. This Act applies to provincial lands throughout the province. The *Manitoba Parks Designation Regulation* was enabled by and promulgated pursuant to the Act in 1997.

The Act states that the purposes of Manitoba’s parks system are to conserve ecosystems and maintain biodiversity; to preserve unique and representative natural, cultural and heritage resources; and, to provide

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596. *Manitoba Wildlife Act*, s. 84(1).

597. *Manitoba Environment Act*, SM 1987-88, c. 26

598. *Manitoba Environment Act*, s. 1.

599. *Manitoba Environment Act*, s. 12.0.2.

600. *Manitoba Environment Act*, s. 1(2).

601. *Manitoba Environment Act*, s. 12.1 and 12.2.

602. *Manitoba Provincial Parks Act*, SM 1993, c. 39.

603. *Manitoba Park Reserves Designation Regulation*, Reg. 37/97

outdoor recreational and educational opportunities and experiences in a natural setting.<sup>604</sup> The system operates on the basis of designations through regulation by the Lieutenant Governor in Council may, by regulation.<sup>605</sup>

All parks are classified into one of the following categories: wilderness park, where the main purpose of the designation is to preserve representative areas of a natural region; a natural park, where the main purpose of the designation is both to preserve areas of a natural region and to accommodate a diversity of recreational opportunities and resource uses; a recreation park, where the main purpose of the designation is to provide recreational opportunities; a heritage park, where the main purpose of the designation is to preserve an area of land containing a resource or resources of cultural or heritage value; or, any other type of provincial park that may be specified in the regulation.<sup>606</sup>

Particular to blue carbon protection, the “wilderness” land use category is to serve “to protect representative or unique natural landscapes in an undisturbed state and provide recreational opportunities that depend on a pristine environment”.<sup>607</sup> Further, it is prohibited in a wilderness park or in an area of any other provincial park that is categorized in the wilderness, backcountry or heritage land use categories, to engage in mining or the development of oil, petroleum, natural gas or hydro-electric power or any other activity specified in a regulation.<sup>608</sup>

Under the *Manitoba Park Parks Designation Regulation*, there are currently no provincial parks bordering Hudson Bay.<sup>609</sup> However, wilderness parks designations with strategically placed wilderness land use categories could be considered as tool for blue carbon sequestration adjacent to the Wapusk National Park.

Beyond environment and water, the Act does not reference Key Blue Carbon Concepts.

### **MANITOBA WATERSHEDS DISTRICTS ACT<sup>610</sup>**

The *Manitoba Watersheds Districts Act* is a provincial statute enacted and recently amended by the *Sustainable Watersheds Act* in 2022. This Act applies throughout the province of Manitoba.

This act establishes an administrative and cooperative system of riparian rights. Its purpose is to “provide for the protection, preservation, conservation, management, control and prudent use of resources through the establishment of watershed districts, and the development and implementation of schemes by the watershed districts; and to protect the correlative rights of owners.”<sup>611</sup>

This Act is based on a promising principle for blue carbon ecosystem protection, namely, that “in administering this Act, regard must be had for the principle that a comprehensive, integrated and coordinated approach to managing watersheds as a whole promotes the health and sustainability of resources within a watershed district’s boundaries”.<sup>612</sup> However, the Act primarily addresses the establishment of watershed districts and the rules those bodies must follow.<sup>613</sup>

This Act does not reference Key Blue Carbon Concepts.

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604. *Manitoba Provincial Parks Act*, s. 5.

605. *Manitoba Provincial Parks Act*, s. 7.

606. *Manitoba Provincial Parks Act*, s. 7(2).

607. *Manitoba Provincial Parks Act*, s. 7(3).

608. *Manitoba Provincial Parks Act*, s. 7(5).

609. *Manitoba Park Reserves Designation Regulation*

610. *Watersheds Districts Act*, C.C.S.M. c. W95.

611. *Watersheds Districts Act*, s. 2.

612. *Watersheds Districts Act*, s. 2.1.

613. *Sustainable Watersheds Act*, s. 7(1).

## **ENDANGERED SPECIES AND ECOSYSTEMS ACT AND REGULATIONS<sup>614</sup>**

*Endangered Species and Ecosystems Act* is a provincial statute enacted in 1989 with a few amendments, the last being proclaimed in 2015. *Endangered and Threatened Ecosystems Regulation* is enabled by was promulgated pursuant this Act in 2015. Both of these apply throughout Manitoba.

The orientation of this Act aligns well with blue carbon ecosystem protection efforts. Its purposes are to ensure the protection and to enhance the survival of endangered and threatened species and species of special concern in the province; to enable the reintroduction of extirpated species into the province; and to conserve and protect endangered and threatened ecosystems in the province and promote the recovery of those ecosystems".<sup>615</sup> Further, ecosystem is defined as a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

The Act authorizes the Lieutenant Governor in Council to declare an ecosystem endangered or threatened.<sup>616</sup> determines that the continued viability of an ecosystem is at serious risk throughout all or a significant portion of its Manitoba range, the Lieutenant Governor in Council may, by regulation, declare the ecosystem an endangered ecosystem. Further, upon designation the Lieutenant Governor in Council may, by regulation, designate an area of Crown land that contains examples of that ecosystem as an ecosystem preservation zone and protect that space through a series of prohibitions including access and any activity.<sup>617</sup> Finally, upon designation, "the department must prepare a recovery strategy that sets out the steps to be taken to prevent any further losses of the ecosystem and to promote the recovery of the ecosystem".<sup>618</sup>

Unfortunately, at this time, the *Endangered and Threatened Ecosystems Regulation*<sup>619</sup> does not list blue carbon resources among the endangered and threatened ecosystems.

## **MANITOBA CLIMATE AND GREEN PLAN ACT<sup>620</sup>**

The *Manitoba Climate and Green Plan Act* was enacted in 2018 and amended in 2021. This Act provides for dedicated planning, monitoring, reporting and oversight of carbon as a driver of climate change.

The Act establishes a legislative obligation for the relevant Minister to develop "a plan with a comprehensive framework of programs, policies and measures to reduce greenhouse gas emissions and address the effects of climate change; promote sustainable development; improve the management and protection of Manitoba's water resources; and preserve and protect Manitoba's natural habitat and biodiversity."<sup>621</sup> As one might expect, "greenhouse gas" means carbon dioxide, methane, nitrous oxide, sulphur hexafluoride and the prescribed categories of hydrofluorocarbons and perfluorocarbons, and includes any other gas or substance or category of gas or substance prescribe d by regulation to be a greenhouse gas; and, "emissions" means the release into the atmosphere of greenhouse gases that are attributable to human activity.<sup>622</sup>

In addition to preparing the plan, which is discussed below, the minister must establish emissions reductions goals for successive five-year periods.<sup>623</sup> The Minister must also establish and maintain a carbon savings account

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614. *Endangered Species and Ecosystems Act*, C.C.S.M. c. E111.

615. *Endangered Species and Ecosystems Act*, s. 2(1).

616. *Endangered Species and Ecosystems Act*, s. 12.1(1) and (2)

617. *Endangered Species and Ecosystems Act*, s. 12.3(2).

618. *Endangered Species and Ecosystems Act*, s. 12.2.

619. *Endangered and Threatened Ecosystems Regulation*, M.R. 70/2015.

620. *Manitoba Climate and Green Plan Act*, SM 2018, c. 30, Sch. A.

621. *Manitoba Climate and Green Plan Act*, s. 2(1).

622. *Manitoba Climate and Green Plan Act*, s. 1.

623. *Manitoba Climate and Green Plan Act*, s. 3(1).

that keeps a running balance of the greenhouse gas emissions reductions achieved in previous five-year periods as compared to the emissions reduction goals set for those periods and add shortfalls to future budgets.<sup>624</sup> All of this must be reported upon annually.<sup>625</sup>

The *Manitoba Climate and Green Plan Act* also establishes a Low Carbon Government Office that is responsible for developing and implementing policies, strategies and initiatives to reduce greenhouse gas emissions and promote sustainable operations by government departments and government agencies and entities prescribed by regulation.<sup>626</sup>

While prioritizes the reduction of greenhouse gas emissions, it does so from the perspective of the constructed environment and human. It does not consider or assign value to naturally occurring carbon sinks within the province. What is not clear from looking at the legislation alone is whether carbon released through the destruction of carbon sinks (blue or otherwise) would be measured. In any event, this Act is likely most useful in terms of the dialogue it provides for through the planning and reporting processes.

## 8.2 MANITOBA POLICY MEASURES

### MADE-IN-MANITOBA CLIMATE AND GREEN PLAN, 2017<sup>627</sup>

This Made-in-Manitoba Climate and Green Plan, 2017, was published *prior* to the *Manitoba Climate and Green Plan Act*. Nevertheless, it appears to exist as a policy element of the statutory framework.

While discussed in the context of agriculture, the 2017 Plan acknowledges that there is an increasing need enhanced sequestration of carbon in soil and greater resiliency to extreme weather.<sup>628</sup> With respect to wetlands, the Plan emphasizes that boreal wetlands in Manitoba are often undervalued and unrecognized in terms of the carbon sequestration services they provide. The 2017 Plan continues:

there is a need for a unified policy approach that is inclusive of these important boreal assets and the valuable ecosystem, economic and societal benefits they provide, both locally and globally. Development of a boreal wetlands conservation policy is an opportunity for Manitoba to show leadership in boreal wetland conservation and stewardship. [...] Northern and other regional communities, Indigenous communities and resource management boards would be actively engaged to assist in developing our approach.<sup>629</sup>

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624. *Manitoba Climate and Green Plan Act*, s. 4(1).

625. *Manitoba Climate and Green Plan Act*, s. 5(1).

626. *Manitoba Climate and Green Plan Act*, s. 10(1).

627. Made-in-Manitoba Climate and Green Plan (2017) (accessed online: [https://www.gov.mb.ca/asset\\_library/en/climatechange/climate-greenplandiscussionpaper.pdf](https://www.gov.mb.ca/asset_library/en/climatechange/climate-greenplandiscussionpaper.pdf)).

628. Climate and Green Plan, p. 26.

629. Climate and Green Plan, p. 45.

Boreal wetlands discussions could help merge with discussions about blue carbon. The following map (Figure 17) shows the range of boreal wetlands in northern Manitoba:

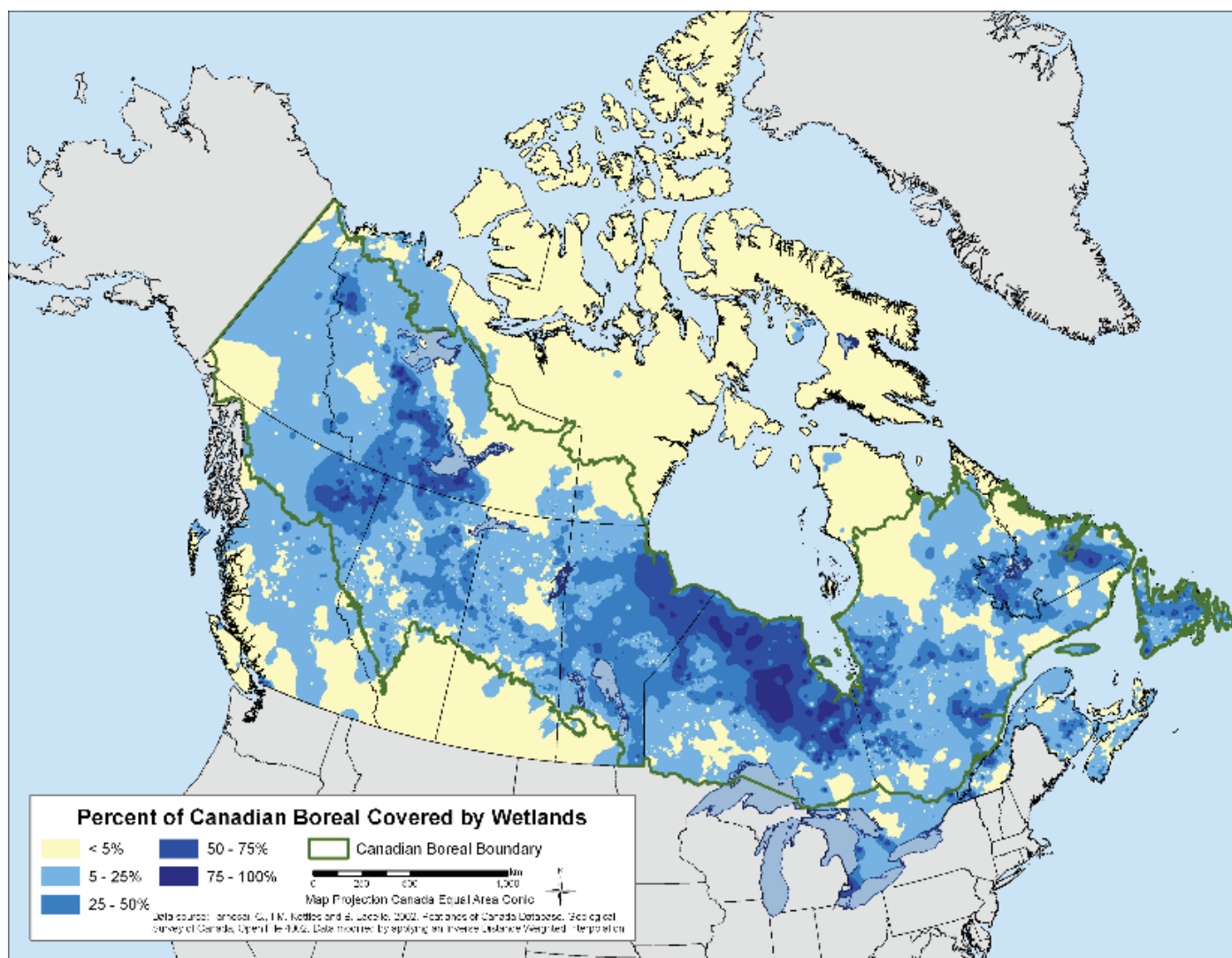


Figure 17. Map of the Percentage of Canadian Boreal Covered by Wetlands.<sup>630</sup>

While the planning promise could provide a live venue for discussions regarding the value and vulnerability of blue carbon ecosystems, Hudson Bay does not appear to be an integral part of the 2017 Plan. The Manitoba Government may benefit from additional data and information to incorporate this into the dialogue.

630. Boreal Songbird Initiative, *Birds at Risk: The Importance of Canada's Boreal Wetlands and Waterways* (accessed online: <https://www.boreal-birds.org/announcements/birds-risk-importance-canadas-boreal-wetlands-and-waterways>, November 22, 2022).



## PART 9: ONTARIO LAWS & POLICIES

This section sets out the legislative and policy tools specific to Ontario that could prove helpful in efforts to support blue carbon ecosystems that may exist in southern Hudson Bay and James Bay. This Part includes provincial source law and policy as well as federal laws that apply uniquely to this province.

A note on Ontario's northern jurisdictional boundaries. The Ontario *Crown Land Use Policy Atlas* appears to show the "Far North Boundary" as following the low-water mark along the coastline but includes river outflows into Hudson and James Bays (such as the Winisk River) within Ontario boundaries.<sup>631</sup> These tidal areas could be home to blue carbon ecosystems and would seem to be within Ontario jurisdiction. Recalling that the starting position is that provinces extend to the ordinary low water mark, and that jurisdiction beyond that boundary vests in Canada,<sup>632</sup> like other provinces and territories, efforts in Ontario would likely be impacted by the same jurisdictional division that compels cooperation in the midst of these terrestrial-marine ecosystems.

As with all of the Parts of this Discussion Paper, it is essential to note that treaty rights – particularly those outlined in Treaty 9 and their subsequent judicial interpretations – apply in this area. However, the terms of Treaty 9 as well as the governance structures employed by the Indigenous peoples of that region as they pertain to blue carbon sequestration initiatives will be analysed in greater detail in Phase 2 of the Discussion Paper.

### 9.1 ONTARIO STATUTES & LEGISLATION

#### **ONTARIO FISHERY REGULATIONS (CANADA)<sup>633</sup>**

This version of the *Ontario Fisheries Regulations* are federal regulations enabled and made pursuant to the *Canada Fisheries Act* in 2007. These Regulations apply in Ontario but do not apply to, among other instances, waters to which the National Parks of Canada Fishing Regulations apply and activities carried out under an aquaculture licence.<sup>634</sup>

Like their counterparts in other provinces and territories, these Regulations address the issuance of licenses, size, possession and quota limits and various restrictions and prohibitions on fishing methods. This Act contains no reference to marine waters, habitat or any Key Blue Carbon Concepts and would be of limited usefulness for blue carbon sequestration efforts in the province.

#### **ONTARIO CONSERVATION LAND ACT<sup>635</sup>**

The *Ontario Conservation Land Act* is a short provincial statute enacted in 1990. It applies throughout Ontario and facilitates cooperation between landowners and different entities, including not-for-profit corporations, to conserve lands.

This Act authorizes owners of land to grant easements over lands to different entities for a variety of conservation purposes including: the conservation, maintenance, restoration or enhancement of all or a portion of the land or the wildlife on the land; the protection of water quality and quantity, including protection of drinking water sources; watershed protection and management; conservation, preservation or protection of the land for agricultural purposes.<sup>636</sup>

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631. Government of Ontario, *Crown Land Use Policy Atlas* (accessed online: <https://www.liaapplications.lrc.gov.on.ca/CLUPA/index.html?view=CLUPA.CLUPA&locale=en-CA>, November 22, 2022).

632. Brian Ballantyne, *Water boundaries on Canada Lands: that fuzzy shadowland*, 2016, Natural Resources Canada (accessed online: <https://www.nrcan.gc.ca/sites/nrcan/files/earthsciences/pdf/Water-bounds-monograph-English-web.pdf>, November 22, 2022).

633. *Ontario Fishery Regulations*, SOR/2007-237.

634. *Ontario Fishery Regulations*, s. 2(1) and (2).

635. *Conservation Land Act*, R.S.O. 1990, c. C.28.

636. *Conservation Land Act*, s. 3(2).

The Act also authorizes the establishment of programs to recognize, encourage and support the stewardship of conservation lands, including through grants.<sup>637</sup> Conservation land includes wetland, areas of natural and scientific interest, land within the Niagara Escarpment Planning Area, conservation authority land and such other land owned by non-profit organizations that through their management contribute to provincial conservation and heritage program objectives.<sup>638</sup>

For this to work as a tool for blue carbon ecosystem conservation, such lands would need to be privately owned. Further research would be needed to understand whether any titles are registered for areas (or parts of areas) where such ecosystems occur.

### **CONSERVATION AUTHORITIES ACT<sup>639</sup>**

The *Conservation Authorities Act* is a provincial statute enacted in 1990 and most recently amended in 2022. It applies to municipalities throughout Ontario and includes a standard non-derogation clause stating expressly that it will not be construed so as to derogate from treaty rights.

The purpose of the *Conservation Authorities Act* is to “provide for the organization and delivery of programs and services that further the conservation, restoration, development and management of natural resources in watersheds in Ontario”.<sup>640</sup> The primary function of this statute is to authorize the establishment of Conservation Authorities among municipalities (which include Indian Bands) that share a watershed.<sup>641</sup> In basic terms, Conservation Authorities are mandated to provide programs and services relating to the watershed,<sup>642</sup> conduct research, acquire land, enter into agreements with landowners, erect infrastructure to control water flow, divert rivers and other water bodies, use lands for recreational purposes, plant trees, etc.<sup>643</sup> Finally, Conservation Authorities may, subject to the approval of the Minister, make regulations restricting and regulating the use of water in or from rivers, streams, inland lakes, ponds, wetlands and natural or artificially constructed depressions in rivers or streams; prohibiting, regulating or requiring the permission of the authority for straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream or watercourse, or for changing or interfering in any way with a wetland; prohibiting, regulating or requiring the permission of the authority for development if, in the opinion of the authority, the control of flooding, erosion, dynamic beaches or pollution or the conservation of land may be affected by the development.<sup>644</sup>

In short, the powers and influence of Conservation Authorities, though subject to Ministerial approval, are fairly significant. While this authority is geared toward rivers, lakes and wetlands, as discussed above, the Ontario boundary appears to reach to the ordinary low water mark along Hudson Bay and James Bay, which could extend application of this Act to some blue carbon assets.

Unfortunately, no Conservation Authorities have been established adjacent to Hudson Bay or James Bay. The Conservation Authority located the furthest north is situated in Timmins, Ontario, which is approximately 315km south. However, the Indigenous communities along the coast of James Bay, for example, could consider establishing such an authority and use it to receive funds and exercise certain decision-making authority over the watersheds in their areas.

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637. *Conservation Land Act*, s.2.

638. *Conservation Land Act*, s. 1.

639. *Conservation Authorities Act*, R.S.O. 1990, c. C.27

640. *Conservation Authorities Act*, s. 0.1.

641. *Conservation Authorities Act*, 2(1).

642. *Conservation Authorities Act*, s. 20.

643. *Conservation Authorities Act*, s. 21.

644. *Conservation Authorities Act*, s. 28.

## **ONTARIO WATER RESOURCES ACT<sup>645</sup>**

The *Ontario Water Resources Act* is a provincial statute enacted in 1990. It applies throughout Ontario.

The purpose of this Act is to “provide for the conservation, protection and management of Ontario’s waters and for their efficient and sustainable use, in order to promote Ontario’s long-term environmental, social and economic well-being”.<sup>646</sup>

Waters means a well, lake, river, pond, spring, stream, reservoir, artificial watercourse, intermittent watercourse, ground water or other water or watercourse.<sup>647</sup> Ontario is divided into three water basins. The water basin applicable to the north coast is the Hudson Bay Basin, which includes: the northern part of Ontario, the water of which drains into Hudson Bay or James Bay.<sup>648</sup>

The Act pursues its purpose through a series of prohibitions on polluting,<sup>649</sup> taking water and transferring water out of designated water basins<sup>650</sup> as well as passing regulations requiring the efficient use of water.<sup>651</sup>

This Act contains no reference to marine waters, habitat or any Key Blue Carbon Concepts and would be of limited usefulness for blue carbon sequestration efforts in the province.

## **ONTARIO ENVIRONMENTAL ASSESSMENT ACT<sup>652</sup>**

The *Ontario Environmental Assessment Act* is a provincial statute that was enacted in 1990 and last amended in 2021. It applies throughout Ontario to enterprises, activities, proposals, plans or programs in respect of activities by the Crown, public bodies, municipalities, businesses or other persons.<sup>653</sup> This Act includes an express non-derogation clause.

The stated purpose of this Act is the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation and wise management in Ontario of the environment.<sup>654</sup> The Act pursues this purpose through a general prohibition against proceeding with an undertaking without environmental assessment and ministerial approval.<sup>655</sup> Environment is defined fairly broadly and includes: air, land or water; plant and animal life, including human life; the social, economic and cultural conditions that influence the life of humans or a community; any building, structure, machine or other device or thing made by humans; any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities; and, any part or combination of the foregoing and the interrelationships between any two or more of them.<sup>656</sup> Significant for blue carbon ecosystem application, water is defined as surface water and ground water, or either of them, but not marine water.

This Act sets out a standard approach to assessing the environmental impacts of proposed activities. It does not establish specific factors that must be considered. Neither does this Act reference ecosystems, habitat, climate

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645. *Ontario Water Resources Act*, R.S.O. 1990, c. O.40.

646. *Ontario Water Resources Act*, s. 0.1.

647. *Ontario Water Resources Act*, s. 1.1.

648. *Ontario Water Resources Act*, s. 34.3(1).

649. *Ontario Water Resources Act*, s. 30.

650. *Ontario Water Resources Act*, s. 34.3(2).

651. *Ontario Water Resources Act*, s. 34.12.

652. *Ontario Environmental Assessment Act*, R.S.O. 1990, c. E.18

653. *Ontario Environmental Assessment Act*, s. 3.

654. *Ontario Environmental Assessment Act*, s. 2.

655. *Ontario Environmental Assessment Act*, s. 5(1).

656. *Ontario Environmental Assessment Act*, s.1

change or other Key Blue Carbon Concepts. While the Act may not be specifically relevant, the processes under this Act for proposals on provincial lands would be relevant where coastal development is planned.

### **ONTARIO ENVIRONMENTAL BILL OF RIGHTS<sup>657</sup>**

The Ontario Environmental Bill of Rights is a provincial statute that came into force in 1994 with the last amendment dated 2020. It creates or acknowledges the right of Ontario residents to participate in decisions that could impact Ontario's environment.

The purpose of this Act is to protect, conserve and, where reasonable, restore the integrity of the environment, to provide sustainability of the environment and to protect the right to a healthful environment by the means provided in this Act. Environment is defined broadly enough to encompass blue carbon ecosystems: the air, land, water, plant life, animal life and ecological systems of Ontario.<sup>658</sup> Water, however, is limited to surface water and ground water and not marine water.

The measures through which this is to be achieved include: prevention, reduction and elimination of the use, generation and release of pollutants that are an unreasonable threat to the integrity of the environment; protection and conservation of biological, ecological and genetic diversity; protection and conservation of natural resources, including plant life, animal life and ecological systems; wise management of natural resources, including plant life, animal life and ecological systems; identification, protection and conservation of ecologically sensitive areas or processes. This Act also provides access to participation in decision-making,<sup>659</sup> accountability and transparency mechanisms including the establishment of a registry,<sup>660</sup> and standing to residents to bring legal action where there is reasonable grounds to believe the Act has been contravened.<sup>661</sup> Finally, the Act requires statement of environmental values that explains how the purposes of this Act are to be applied when decisions that might significantly affect the environment are made in the ministry.<sup>662</sup>

Like the previous environmental rights instruments discussed above, this *Ontario Environmental Bill of Rights* does not explore or require consideration of the carbon sequestration value of blue carbon ecosystems. Climate change, for example, is not even mentioned. Actions taken under this Bill would require individuals and government administrators to have that awareness.

### **ONTARIO ENVIRONMENTAL PROTECTION ACT<sup>663</sup>**

The *Ontario Environmental Protection Act* is a provincial statute enacted in 1990.

The purpose of this Act is to provide for the protection and conservation of the natural environment. This Act is structured around a general prohibition against the discharge into the natural environment of any contaminant.<sup>664</sup> Natural environment in this Act means the air, land and water, or any combination or part thereof, of the Province of Ontario. Further, land is defined to include surface land not enclosed in a building, land covered by water and all subsoil, or any combination or part thereof. Water is defined to include surface water and ground water, or either of them.<sup>665</sup> The powers and duties of the Minister include investigating pollution and waste issues, researching general environmental issues and raising awareness.<sup>666</sup>

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657. *Ontario Environmental Bill of Rights*, 1993, S.O. 1993, c. 28

658. *Ontario Environmental Bill of Rights*, s. 1.

659. *Ontario Environmental Bill of Rights*, s. 3(1).

660. *Ontario Environmental Bill of Rights*, s. 6(1).

661. *Ontario Environmental Bill of Rights*, s. 84.

662. *Ontario Environmental Bill of Rights*, s. 7.

663. *Ontario Environmental Protection Act*, R.S.O. 1990, c. E.19. [Ontario EPA]

664. Ontario EPA, s. 6(1).

665. Ontario EPA, s. 1.

666. Ontario EPA, s. 4(1).

An interesting feature of this Act, is that it acknowledges Ontario may need to take action within its borders to protect environment outside its borders. No action taken under this Act is invalid by reason only that the action was taken for the purpose of the protection, conservation or management of the environment outside Ontario's borders.<sup>667</sup> Beyond this, this Act does not offer a clear means to protect blue carbon ecosystems.

### **ONTARIO FAR NORTH ACT<sup>668</sup>**

The *Far North Act* is a provincial statute enacted in 2010. This Act applies in throughout the Far North region of Ontario (as defined below) but not to reserves, federal Crown land, municipalities, private lands.<sup>669</sup>

The purpose of this Act is to provide for community based land use planning in the Far North that, sets out a joint planning process between the First Nations and Ontario; supports the environmental, social and economic objectives for land use planning for the peoples of Ontario that are set out in section 5; and, is done in a manner that is consistent with the recognition and affirmation of existing Aboriginal and treaty rights in section 35 of the *Constitution Act, 1982*, including the duty to consult.<sup>670</sup> Among the objectives of the act are the protection of ecological systems in the Far North by various means, including the designation of protected areas in community based land use plans and the maintenance of biological diversity, ecological processes and ecological functions, including the storage and sequestration of carbon in the Far North.<sup>671</sup>

The processes under the Act are triggered where First Nations indicate an interest in initiating the planning process. The Minister must work with them to prepare terms of reference to guide the designation of an area in the Far North as a planning area and the preparation of a land use plan for the purposes of this section.<sup>672</sup> This process can also be completed through a "joint body" of seven or more First Nations.<sup>673</sup>

Following this, First Nations may work with the Minister to develop a land use plan.<sup>674</sup> In preparing the Plan, the First Nations and the Minister must take into account the following objective: "the maintenance of biological diversity, ecological processes and ecological functions, including the storage and sequestration of carbon in the Far North." Plans are approved by Ministerial Order and resolution of each of the First Nations involved in the planning process.<sup>675</sup> Upon approval, the council of each of the First Nations may jointly request that the Minister make a regulation specifying the boundaries of a protected area in the planning area.<sup>676</sup> No regulations have yet been made under the Act.

Plans can be used to restrict activities that may impact blue carbon ecosystems in the Far North. If there is a community based land use plan for a planning area, no person may make any decision under an Act respecting the allocation, disposition or use of public land and natural resources in the area or carry on any activity in the area that is related to that allocation, disposition or use unless the decision or the activity, as the case may be, is consistent with the land use designations and permitted land uses specified in the plan and any permitted activities prescribed for the purpose of the plan. Further, the following are prohibited activities in a protected area: Prospecting, mining claim registration or mineral exploration; Opening certain mines; commercial timber harvest; oil and gas exploration or production and other activities.<sup>677</sup>

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667. Ontario EPA, s. 3(1).

668. *Ontario Far North Act*, 2010, S.O. 2010, c. 18. [Ontario FNA]

669. *Ontario FNA*, s. 3.

670. *Ontario FNA*, s. 1.

671. *Ontario FNA*, s. 5.

672. *Ontario FNA*, s. 9(1).

673. *Ontario FNA*, s. 7(1) and (2).

674. *Ontario FNA*, s. 9(6).

675. *Ontario FNA*, s. 9(14).

676. *Ontario FNA*, s. 11(1).

677. *Ontario FNA*, s. 14(1).



First Nations concerned about carbon sequestration could use the planning and designation processes under this Act to extend real protections – at least to the ordinary low water mark – of blue carbon ecosystems in the Far North region.

**ONTARIO DESCRIPTION OF THE FAR NORTH<sup>678</sup>**

This Order describes the Far North region of Ontario for the purposes of the *Ontario Far North Act*. It states, “Far North” means the portion of Ontario that lies north of the line identified as the “Far North Boundary” on the series of maps entitled “Regulation Plan of the Southerly Boundary of the Far North of Ontario”, comprised of map sheets 1 to 20, dated June 24, 2009 and filed in the office of the Surveyor General (Figure 18).

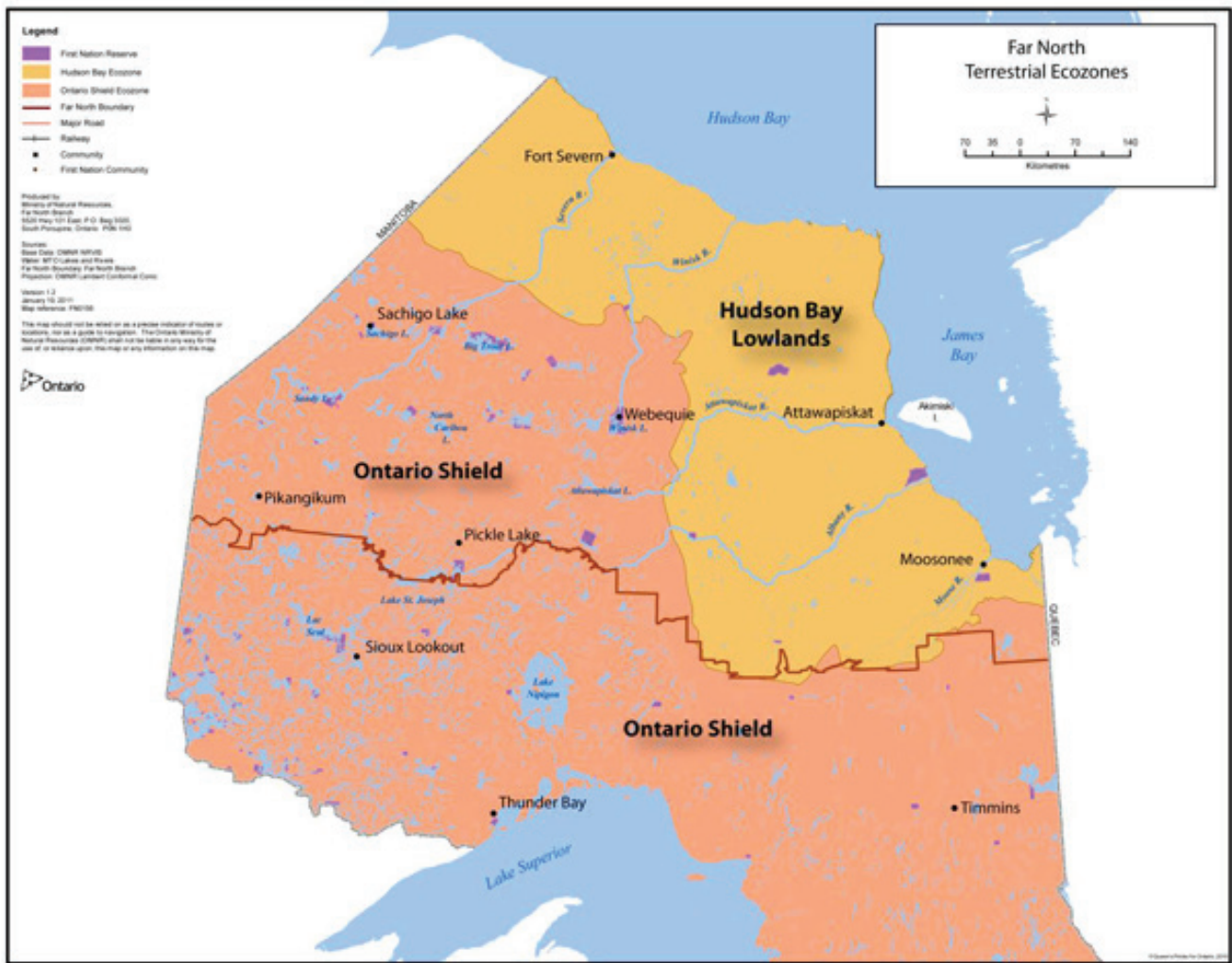


Figure 18. Depiction of Ontario’s “Far North”<sup>679</sup>

678. *Description of the Far North Regulation* (O. Reg. 21/11).

679. Far North” Land Use Strategy: Discussion paper <https://www.ontario.ca/page/far-north-land-use-strategy-discussion-paper>

## **ONTARIO PLANNING ACT<sup>680</sup>**

The *Ontario Planning Act* is a provincial statute enacted in 1990 and applies throughout Ontario.

The purposes of this Act include, among other things, promoting sustainable economic development in a healthy natural environment within the policy and by the means provided under this Act; and to provide for a land use planning system led by provincial policy.<sup>681</sup> Those with responsibilities under the Act must consider, among other things, the protection of ecological systems, including natural areas, features and functions; and, the mitigation of greenhouse gas emissions and adaptation to a changing climate.<sup>682</sup> Further, a plan must contain policies that identify goals, objectives and actions to mitigate greenhouse gas emissions and to provide for adaptation to a changing climate, including through increasing resiliency.<sup>683</sup>

Municipal councils prepare the plans and the Minister approves them. Zoning bylaws may be passed restricting activities in land that is subject to flooding or on land with steep slopes, or that is rocky, low-lying, marshy, unstable, hazardous, subject to erosion or to natural or artificial perils and within any defined area or areas, that is a significant wildlife habitat, wetland, woodland, ravine, valley or area of natural and scientific interest, that is a significant corridor or shoreline of a lake, river or stream, or that is a significant natural corridor, feature or area.<sup>684</sup>

This Act outlines a general planning process and does not specifically target blue carbon ecosystems. However, where local councils have an interest, there exist land use planning tools that could be employed to designate blue carbon ecosystem areas – at least to the low water mark – for restricted activities.

## **ONTARIO WILDERNESS AREAS ACT<sup>685</sup> AND WILDERNESS AREAS REGULATIONS<sup>686</sup>**

The *Ontario Wilderness Act* is a provincial statute enacted in 1990. It applies throughout Ontario.

The Act empowers the Lieutenant Governor in Council to “set apart any lands belonging to Her Majesty in Right of Ontario as a wilderness area for the preservation of the area as nearly as may be in its natural state in which research and educational activities may be carried on, for the protection of the flora and fauna, for the improvement of the area, having regard to its historical, aesthetic, scientific or recreational value, or for such other purposes as may be prescribed by the regulations made under this Act”.<sup>687</sup> The Lieutenant Governor in Council is also empowered to pass regulations to prohibit and control use, access and management of that area.<sup>688</sup>

The Regulations do not designate a wilderness area along the Hudson Bay or James Bay coasts.

## **ONTARIO FISH AND WILDLIFE CONSERVATION ACT<sup>689</sup> AND ONTARIO FISH LICENSING REGULATIONS<sup>690</sup>**

The *Ontario Fish and Wildlife Conservation Act* is a provincial statute enacted in 1997. It applies throughout Ontario and governs all animals that “belong to a species that is wild by nature”.<sup>691</sup> The Act generally prohibits hunting, trapping, fishing and aquaculture subject to exceptions.<sup>692</sup>

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680. *Ontario Planning Act*, R.S.O. 1990, c. P.13.

681. *Ontario Planning Act*, s. 1.1.

682. *Ontario Planning Act*, s. 2.

683. *Ontario Planning Act*, s. 16(14).

684. *Ontario Planning Act*, s. 34(1).

685. *Wilderness Areas Act*, R.S.O. 1990, c. W.8

686. *Wilderness Areas Regulations*, R.R.O. 1990, 1098.

687. *Ontario Wilderness Areas Act*, s. 1.

688. *Ontario Wilderness Areas Act*, s. 6.

689. *Ontario Fish and Wildlife Conservation Act*, 1997, S.O. 1997, c. 41.

690. *Ontario Fish Licensing Regulations*, OR 664/98.

691. *Ontario Fish and Wildlife Conservation Act*, s. 1(1).

692. *Ontario Fish and Wildlife Conservation Act*, s. 5(1).

The Act's aquaculture provisions are likely the most relevant to any blue carbon-related initiative. Under the Act, it is prohibited to engage in aquaculture unless the fish that are cultured belong to a species prescribed by the regulations and are cultured under the authority of a licence and in accordance with the regulations.<sup>693</sup> The aquaculture provisions under the *Ontario Fish Licensing Regulations* require a person wishing to engage in aquaculture to apply for a license and conduct those activities only in the location stated in the license.<sup>694</sup> The provisions are focused primarily on keeping the fish from escaping.

The only other notable provision in this act relates to land acquisitions. The Minister may, on behalf of the Crown, acquire land for the purpose of conserving or managing wildlife or fish populations, or the ecosystems of which they are a part.<sup>695</sup> This is accomplished under the authorities set out in the *Ministry of Infrastructure Act, 2011* and can be through gift or other means.

Both the Act and these Regulations are focused on kingdom animalia. Ecosystems are only an object of protection through wildlife. Otherwise, habitat, plant species and other Key Blue Carbon Concepts are not referenced at all.

### **ONTARIO ENDANGERED SPECIES ACT,<sup>696</sup> SPECIES AT RISK IN ONTARIO LIST<sup>697</sup> AND HABITAT REGULATIONS<sup>698</sup>**

The *Ontario Endangered Species Act* is a provincial statute enacted in 2007 and amended twice since then. It applies throughout Ontario. The *Habitat Regulations* were enabled pursuant to the Act in 2007 and there have been no amendments since then. The *Species at Risk in Ontario List* were enabled pursuant to the Act in 2008 and have been amended several times since then.

The purposes of this Act align more comfortably with blue carbon ecosystem protection than the previous Act and Regulations. The purposes of the OESA are to identify species at risk based on the best available scientific information, including information obtained from community knowledge and aboriginal traditional knowledge; to protect species that are at risk and their habitats, and to promote the recovery of species that are at risk; and, to promote stewardship activities to assist in the protection and recovery of species that are at risk.<sup>699</sup> Species are defined as a species, subspecies, variety or genetically or geographically distinct population of animal, plant or other organism, other than a bacterium or virus, that is native to Ontario. Habitat is defined to include those areas prescribed by regulation where a species has been identified as extirpated, endangered or threatened and areas on which any other species depend, directly or indirectly, to carry on their life processes.<sup>700</sup>

A body called the Committee on the Status of Species at Risk in Ontario is responsible for identifying species for listing purposes.<sup>701</sup> Under the Act it is prohibited to “kill, harm, harass, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species.<sup>702</sup> Further, it is prohibited to damage or destroy the habitat of a species listed in the Regulations.<sup>703</sup> To give effect to the prohibition against habitat damage, the Minister is authorized make an order prohibiting, ceasing or modifying activities where the habitat is that of a listed species.<sup>704</sup> The Minister may also implement

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693. *Ontario Fish and Wildlife Conservation Act*, s. 19(1).

694. *Ontario Fish Licensing Regulations*, s. 19(1).

695. *Ontario Fish and Wildlife Conservation Act*, s. 81(1).

696. *Ontario Endangered Species Act*, S.O. 2007, c. 6. [OESA]

697. *Species at Risk in Ontario List*, O. Reg. 230/08

698. *Habitat Regulations*, O. Reg. 832/21.

699. *Ontario Endangered Species Act*, s. 1.

700. *Ontario Endangered Species Act*, s. 2.

701. *Ontario Endangered Species Act*, s. 3.

702. *Ontario Endangered Species Act*, s. 9.

703. *Ontario Endangered Species Act*, s. 10.

704. *Ontario Endangered Species Act*, s. 28(1).

Stewardship Programs to support the protection of species and habitats.<sup>705</sup> The Minister may enter into agreements with Indigenous peoples to except them from these prohibitions subject to survival thresholds for the relevant species.<sup>706</sup>

The *Habitat Regulations* list the habitats entitled to protections under the Act. Some of these are linked to species of animals and some are linked to species of plant (i.e. the “four-leaved milkweed habitat”). Currently, there are no animal or plant species habitats listed for the Hudson or James Bay regions of Ontario. The *Species at Risk in Ontario List* includes 50 special concern species, 115 endangered species, 56 threatened species and 16 extirpated species.<sup>707</sup> Eskimo Curlew have a range which includes the Hudson Bay and James Bay coasts. These are listed as endangered. Polar bear and Wolverine call the northern reaches home and are listed as threatened. Beluga and Caribou are arctic mammals and are listed as Special Concern Species.

If it could be established that a species of plant involved in a blue carbon ecosystem is rooted above the low water and is extirpated, endangered or threatened, this statute could be useful. A closer look at all of the listed species and their ranges would be a productive first step.

### **ONTARIO PROVINCIAL PARKS AND CONSERVATION RESERVES ACT,<sup>708</sup> CONSERVATION AREA REGULATIONS GENERAL PROVISIONS REGULATIONS<sup>709</sup> AND PROVINCIAL PARKS GENERAL PROVISIONS REGULATIONS<sup>710</sup>**

The *Ontario Provincial Parks and Conservation Reserves Act* is a provincial statute that was enacted in 2006. *Provincial Parks General Provisions Regulations* were enacted in 2007. *Conservation Area Regulations General Provisions Regulations* were enacted in 2007. These apply throughout Ontario.

The purpose of this Act is to “permanently protect a system of provincial parks and conservation reserves that includes ecosystems that are representative of all of Ontario’s natural regions, protects provincially significant elements of Ontario’s natural and cultural heritage, maintains biodiversity and provides opportunities for compatible, ecologically sustainable recreation”.<sup>711</sup> The objectives of provincial parks and conservation areas include, among other things, permanently protect representative ecosystems, biodiversity and provincially significant elements of Ontario’s natural and cultural heritage and to manage these areas to ensure that ecological integrity is maintained and facilitate scientific research and to provide points of reference to support monitoring of ecological change on the broader landscape.<sup>712</sup> Maintenance of ecological integrity is the guiding principle of the Act.<sup>713</sup> The central concept of the Act is ecological integrity, which “refers to a condition in which biotic and abiotic components of ecosystems and the composition and abundance of native species and biological communities are characteristic of their natural regions and rates of change and ecosystem processes are unimpeded”.<sup>714</sup>

Like other parks and conservation area statutes described in this Discussion Paper, the Ontario model operates on the basis of classifications that accord with a scale of stringency with respect to permitted uses and prohibitions and ministerial designations. From the perspective of blue carbon ecosystem protection perspective, Wilderness Park and Natural Reserve Park classifications offer the greatest level of protection.<sup>715</sup>

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705. *Ontario Endangered Species Act*, s. 47.

706. *Ontario Endangered Species Act*, s. 19.

707. *Species at Risk in Ontario List*, Schedules 1, 2, 3.

708. *Ontario Provincial Parks and Conservation Reserves Act*, S.O. 2006, c. 12. [Ontario PPCR Act]

709. *Conservation Area Regulations General Provisions Regulations*, O. Reg 319/07.

710. *Provincial Parks General Provisions Regulations* O. Reg. 347/07.

711. *Ontario PPCR Act*, s. 1.

712. *Ontario PPCR Act*, s. 2.

713. *Ontario PPCR Act*, s. 3.

714. *Ontario PPCR Act*, s. 5.

715. *Ontario PPCR Act*, s. 8(1).

The objective of wilderness class parks is to “protect large areas where the forces of nature can exist freely and visitors travel by non-mechanized means, except as may be permitted by regulation, while engaging in low-impact recreation to experience solitude, challenge and integration with nature”.<sup>716</sup> The objectives of nature reserve class parks are “to protect representative ecosystems and provincially significant elements of Ontario’s natural heritage, including distinctive natural habitats and landforms, for their intrinsic value, to support scientific research and to maintain biodiversity”<sup>717</sup>. The Lieutenant Governor in Council is authorized to set apart as a provincial park or a conservation reserve any area in Ontario by Order.<sup>718</sup>

It is prohibited to disturb, cut, kill, remove or harm any plant, tree or natural object in a conservation reserve<sup>719</sup> or a provincial park.<sup>720</sup> Also in line with other land conservation regimes discussed above, certain activities are verboten in the designated areas: commercial timber harvest; generation of electricity; prospecting, staking mining claims, developing mineral interests or working mines; extracting aggregate, topsoil or peat and other industrial uses.<sup>721</sup>

There is a notable caveat in the parks and conservation reserve system as it pertains to the “Far North” (please see the description of this region above). This caveat serves to reflect community land use plans under the *Far North Act*. The Lieutenant Governor in Council may make an order *decreasing* the area of a provincial park or conservation reserve, where the area to be decreased is located in the Far North and is located in whole or in part in a planning area only if, a replacement area of equal or increased size is designated as a protected area in a community based land use plan or the order is conditional on there being a replacement area of equal or increased size designated as a protected area in a community based land use plan, and, the replacement area contributes to the protection of areas of cultural value in the Far North and the protection of ecological systems in the Far North.<sup>722</sup>

Beyond these general protections, there are no references to Key Blue Carbon Concepts.

### **POLAR BEAR PROVINCIAL PARK**<sup>723</sup>

Polar Bear Provincial Park is classified as a wilderness park pursuant to section 5 of the *Provincial Parks General Provisions Regulations*. This park is located on the northwest coast of James Bay and the southern coast of Hudson Bay, is the largest park in Ontario and is a Ramsar site, so designated in 1987.<sup>724</sup> As a wilderness park, its purpose is to protect large areas where the forces of nature can exist freely and visitors travel by non-mechanized means, except as may be permitted by regulation, while engaging in low-impact recreation to experience solitude, challenge and integration with nature”.<sup>725</sup>

According to Ontario Parks, Polar Bear Provincial Park protects landscapes of provincial, national, and international importance, including the world’s third-largest wetland. Parks specifically references “climate regulation” among the attributes of these lands.<sup>726</sup> The park was named for its function as habitat for the

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716. Ontario PPCR Act, s. 8(2).

717. Ontario PPCR Act, s. 8(3).

718. Ontario PPCR Act, s. 9(1).

719. Conservation Area Regulations General Provisions Regulations, s. 2(2).

720. Provincial Parks General Provisions Regulations, s. 2(1).

721. Ontario PPCR Act, s. 16(1).

722. Ontario PPCR Act, s. 9(6).

723. Designation and Classification of Provincial Parks, Ontario Regulation 316/07.

724. Ramsar Sites Information Service, *Polar Bear Provincial Park* (accessed online : <https://rsis.ramsar.org/ris/360>)

725. Ontario PPCR Act, s. 8(2).

726. Ontario Parks, Parks Blog - Polar Bear Provincial Park (accessed online: <https://www.ontarioparks.com/parksblog/polar-bear-provincial-park-cleanup/>, November 22, 2022).



southern-most population of polar bears in the world.<sup>727</sup> The area represents a vast wetland complex with a “series of beach ridges interspersed with ponds, bogs, fens and marshes subject to saltwater inundation that includes the worlds most southerly example of tundra ecosystem”.

## ONTARIO MIGRATORY BIRD SANCTUARIES (CANADA)

There are nine Migratory Bird Sanctuaries established or continued in Ontario pursuant to the *Migratory Birds Convention Act*.<sup>728</sup> Hannah Bay, St. Joseph’s Island, Chantry Island, Rideau Valley Wildlife Sanctuary, Moose River, Mississippi Lake Upper Canada, Beckett Creek, and Eleanor Island.

As noted above, the *Migratory Bird Sanctuary Regulations* prohibit any activity that is harmful to migratory birds or the eggs, nests or habitat of migratory birds, except under authority of a permit”.<sup>729</sup> The areas within these sanctuaries are protected by virtue of the protections afforded to the migratory birds that use those areas through the habitat services provided by blue carbon ecosystems. Notably, many of these areas the straddle terrestrial/ marine divide, helping to organize around any jurisdictional bifurcations that affect other areas of coastline.

While the *Migratory Birds Convention Act* may not provide targeted protection to blue carbon ecosystems, these protected areas have recognized the disregard that ecology shows for jurisdictional divides, and they have been well-entrenched in federal law for decades. The following two descriptions of coastal MBS are provided in an effort to paint a fuller picture of the conservation landscape in province.

**The Moose River Migratory Bird Sanctuary:** is composed of two distinct units, namely, Ship Sands Island and a portion of mainland, separated by the mouth of Moose River, on the southwestern side of James Bay (Figure 19). Ontario owns and manages the lands covered by this sanctuary and Nunavut manages the areas below the high-water mark. [...] Numerous tidal creeks divide the downstream end (northeast) of the Ship Sands Island portion of the sanctuary and only a small amount of what used to be the extensive tidal mud flats adjoining the island are included within it.<sup>730</sup>

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727. Ibid.

728. *Migratory Birds Convention Act*, S.C. 1994, c. 22

729. MBCR, s. 10(1).

730. Environment and Climate Change Canada, Migratory Bird Sanctuaries – Moose River (accessed online: <https://www.canada.ca/en/environment-climate-change/services/migratory-bird-sanctuaries/locations/moose-river.html#toc2>, November 22, 2022).

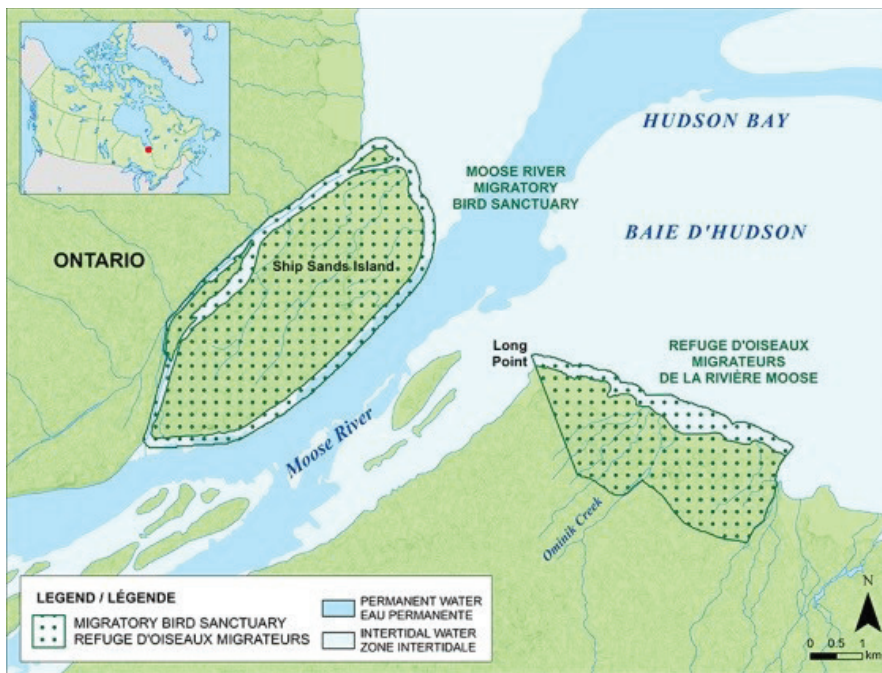


Figure 19. Map of Moose River Migratory Bird Sanctuary

**The Hannah Bay Migratory Bird Sanctuary:** is located in southern James Bay (Figure 20). The Province of Ontario manages the lands within the sanctuary, the Government of Nunavut manages the marine areas below the ordinary high-water mark including water, shoals and tidal mud flats.

This MBS includes areas of extensive tidal mud flats and well-developed sedge marshes interspersed with lakes and streams. The tidal mud flats are composed of hard-packed silt or clay and can reach several kilometres in width, while the waters in the area are turbid and brackish.<sup>731</sup>

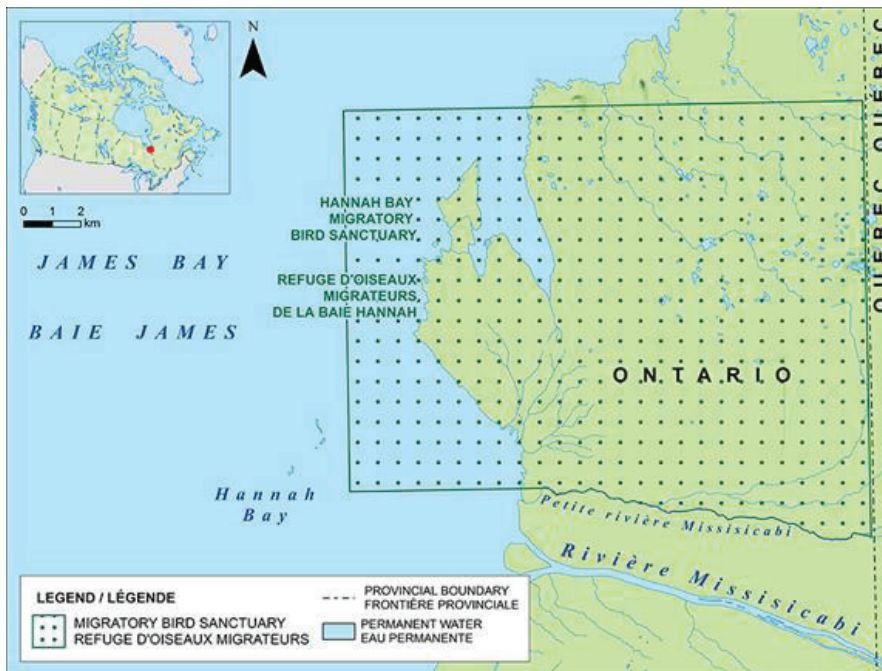


Figure 20. Map of Hannah Bay Migratory Bird Sanctuary

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## 9.2 ONTARIO POLICY MEASURES

### 2020 PROVINCIAL POLICY STATEMENT<sup>732</sup>

The 2020 Provincial Policy Statement was issued under the authority of section 3 of the *Planning Act*, discussed above. It came into effect on May 1, 2020. Reference to this document is included here more as an example of what it *could* do for the Hudson Bay and James Bay coastlines. Understanding the Ecoregion references in the following paragraphs will require reference to the map included in the section immediately below.

Exercises of authority relating to a planning matter must be consistent with the Policy Statement. To wit, development and site alteration is not permitted in: a) significant wetlands in Ecoregions 5E, 6E and 7E1; and b) significant coastal wetlands.<sup>733</sup> Coastal wetland means a) any wetland that is located on one of the Great Lakes or their connecting channels (Lake St. Clair, St. Marys, St. Clair, Detroit, Niagara and St. Lawrence Rivers); or b) any other wetland that is on a tributary to any of the above-specified water bodies and lies, either wholly or in part, downstream of a line located 2 kilometres upstream of the 1:100 year floodline (plus wave run-up) of the large water body to which the tributary is connected.<sup>734</sup> Significant: means a) in regard to wetlands, coastal wetlands and areas of natural and scientific interest, an area identified as provincially significant by the Ontario Ministry of Natural Resources and Forestry using evaluation procedures established by the Province, as amended from time to time.<sup>735</sup>

Paragraph 2.1.5 goes on to say that development and site alteration is not permitted in: a) significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E1; b) significant woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River)<sup>1</sup>; c) significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River)<sup>1</sup>; d) significant wildlife habitat; e) significant areas of natural and scientific interest; and f) coastal wetlands in Ecoregions 5E, 6E and 7E1 that are not subject to policy 2.1.4(b) unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

Neither Hudson nor James Bay coastal wetlands are included in these descriptions. Perhaps with more awareness about the critical role blue carbon ecosystems and their lowland neighbours play, these areas could be incorporated into this policy scheme.

### ONTARIO ECOZONE 0E: HUDSON BAY LOWLANDS

Ontario has implemented a system of Ecological Land Classification that includes six units: ecozones, ecoregions, ecodistricts, ecosections, ecosites and ecolements (Figure 21). Ecozones are the largest units and are used to report to status and trends of aquatic stress, land cover type and vegetative growing season.<sup>736</sup>

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732. *Provincial Policy Statement, 2020*, Order in Council No. 229/2020 (<https://files.ontario.ca/mmah-provincial-policy-statement-2020-accessible-final-en-2020-02-14.pdf>). [PPS 2020]

733. PPS 2020, s. 2.1.4

734. PPS 2020, p. 41.

735. PPS 2020, p. 51.

736. Government of Ontario, (accessed online: <https://www.ontario.ca/page/ecological-land-classification>, November 22, 2022)



Figure 21. Map of Ontario's Ecozones and Ecoregions.<sup>737</sup>

The ecozone relevant to this Discussion Paper is Ecozone 0E, which encompasses the Hudson Bay Coast Ecoregion, the Northern Taiga Ecoregion and the James Bay Ecoregion. According to the Government of Ontario's description of the area, "There are globally significant wetlands comprised of open and treed fens, bogs, and palsas in this ecozone". Further, "the coastal mudflats are important staging areas for hundreds of thousands of shorebirds. The wetlands throughout this ecozone provide ideal habitat for various invertebrates, including biting flies such as mosquitoes, black flies, and bulldogs (tabanids). Many of the invertebrates in adjacent Hudson Bay have Arctic affinities".<sup>738</sup>

<sup>737</sup>. *Ibid.*

<sup>738</sup>. *Ibid.*

## **PRESERVING AND PROTECTING OUR ENVIRONMENT FOR FUTURE GENERATIONS A MADE-IN-ONTARIO ENVIRONMENT PLAN (2018)<sup>739</sup>**

This high level document aims to help improve the resilience of natural ecosystems, facilitate collaboration with partners to conserve and restore natural ecosystems such as wetlands, and ensure that climate change impacts are considered when developing plans for their protection.<sup>740</sup>

The status report indicates that an advisory panel on climate change was established to provide the minister with expert advice on the implementation of the province's climate change actions.<sup>741</sup> Largely focused on adaptation rather than mitigation. Further, the status report conveys that the Ministry of Natural Resources and Forestry is providing a \$420,000 Transfer Payment to Ducks Unlimited Canada to support wetland restoration and management.<sup>742</sup> This seems related to biodiversity efforts rather than carbon sequestration; though, there may be interest alignment in this line item.

Blue carbon is not mentioned, and neither is the Far North Region. The only mention of sequestration is in relation to forests. There is no reference to marine areas and other Key Blue Carbon Concepts are not referenced.

## **A WETLAND CONSERVATION STRATEGY FOR ONTARIO (2017-2030)<sup>743</sup>**

*A Wetland Conservation Strategy for Ontario (2017-2030)* is a provincial policy document that intends to set "strategic directions, goals and desired outcomes, and actions the government will undertake by 2030 to improve wetlands in Ontario".<sup>744</sup> This Policy is housed within the Ministry of Natural Resources and Forestry.

The Government of Ontario acknowledges in this document key features which the Policy Statement discussed above seems to overlook. The Strategy explains that "in Ontario, the majority of wetlands are found in northern Ontario, with the Hudson Bay Lowlands Ecozone accounting for 20,000,000 hectares or about 57 per cent of Ontario's wetlands (Ontario Biodiversity Council 2015).<sup>745</sup> Further, the Strategy explains that threats to northern Ontario wetlands originate more commonly from activities such as mining, hydro-electric and alternative energy development, and transportation infrastructure. Longer-term, climate change is expected to have a significant impact on wetlands in northern Ontario, particularly on peatlands in the Far North.<sup>746</sup> Increases or decreases in water levels as a consequence of climate change may result in changes in the extent and composition of current wetlands and alter the ability of these ecosystems to store and sequester carbon.<sup>747</sup>

A helpful statistic for the blue carbon sequestration toolkit, the Strategy estimates that "peatlands in the Far North of Ontario annually sequester an amount of carbon equal to about one third of Ontario's total carbon emissions (The Far North Science Advisory Panel 2010). [...] The wetlands of the Hudson Bay Lowlands in the Far North of Ontario are among the most productive subarctic wetland habitats in the world. They support a

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739. Ontario Ministry of the Environment, Conservation and Parks, *Preserving and Protecting our Environment for Future Generations A Made-in-Ontario Environment Plan* (accessed online: <https://www.southfrontenac.net/en/resources/Ontario-EnvironmentPlan.pdf>, November 22, 2022).

740. Ontario Environment Plan, p. 45.

741. Ontario Ministry of the Environment, Conservation and Parks, (accessed online: <https://www.ontario.ca/page/made-in-ontario-environment-plan#section-5>, November 22, 2022).

742. Ontario Ministry of the Environment, Conservation and Parks, (accessed online: <https://www.ontario.ca/page/made-in-ontario-environment-plan#section-5>, November 22, 2022).

743. Ontario Ministry of Natural Resources and Forestry, *A Wetland Conservation Strategy for Ontario 2017-2030* (2017), (accessed online: [https://files.ontario.ca/mnr\\_17-075\\_wetlandstrategy\\_final\\_en-accessible.pdf](https://files.ontario.ca/mnr_17-075_wetlandstrategy_final_en-accessible.pdf)). [Ontario Wetland Strategy]

744. *Ontario Wetland Strategy*, p.1.

745. *Ontario Wetland Strategy*, p.2.

746. *Ontario Wetland Strategy*, p.8.

747. *Ontario Wetland Strategy*, p.8.



significant global migratory flyway for waterfowl and shorebirds in addition to being the densest carbon storage and water-retention ecosystems in Ontario.”<sup>748</sup>

The Strategy is organized around 4 elements: Awareness, Knowledge, Partnership and Conservation. The Strategy also outlines 2 Targets: By 2025, the net loss of wetland area and function is halted where wetland loss has been the greatest. By 2030, a net gain in wetland area and function is achieved where wetland loss has been the greatest.<sup>749</sup> While the importance of the Hudson Bay Lowlands and the Far North more generally is clearly stated, the Strategy does not explain *how* this region in particular is going to be reached and incorporated withing the process and targets.

A renewal period for this Strategy could be expected to begin in 2-5 years. Monitoring achievements under this Strategy and working on the next one to incorporate northern-specific strategies could bear fruit.

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748. *Ontario Wetland Strategy*, p.5.

749. *Ontario Wetland Strategy*, p.27.

# PART 10: QUÉBEC LAWS & POLICIES

This section sets out the legislative and policy tools specific to Quebec that could prove helpful in efforts to support blue carbon ecosystems that may exist in southern Hudson Bay and James Bay. This Part includes provincial source law and policy as well as federal laws that apply uniquely to this province. Jurisdictional boundaries are a complicating factor in every jurisdiction in this Discussion Paper. So too in Quebec. The *James Bay and Northern Quebec Agreement* (JBNQA) identifies the ordinary high water in descriptions of the boundaries of Quebec. This is what is used for reference in this Part. As with other Parts of this Discussion Paper, efforts in blue carbon ecosystem protection will require cooperation between Canada, Quebec and Indigenous governing organizations.

Similar to the Yukon, Northwest Territories and Nunavut, Quebec jurisdiction is subject to underlying Inuit treaty rights as well as Cree treaty rights. The *James Bay and Northern Quebec Agreement* (JBNQA)<sup>750</sup> was signed on November 11, 1975, by the Cree and Inuit representatives, the Governments of Quebec and Canada, the Société de développement de la Baie James, the Société d'énergie de la Baie James and Hydro-Québec and incorporated into Canadian law through the *James Bay and Northern Quebec Native Claims Settlement Act* in 1976.<sup>751</sup> This first modern treaty in Canada was accomplished in an incredibly short period of time. Reflective of the urgency and the federal policies in place at the time, the coastal boundaries of the JBNQA ran with the coastal boundaries of the province of Quebec. To reflect their rights as maritime Indigenous peoples, Inuit of Quebec pursued a second modern treaty. The *Nunavik Land Claims Agreement*<sup>752</sup> was signed in 2006 and incorporated into Canadian law through the *Nunavik Inuit Land Claims Agreement Act*<sup>753</sup> in 2008. This second treaty established the Nunavik Marine Region, which extends from the coastline into North-eastern James Bay, North-eastern Hudson Bay and Hudson Bay Straight.

The governance and regulatory structures under the JBNQA and the *Nunavik Agreement* are essential for understanding the management of any blue carbon ecosystems in the Nunavik Marine Region. These will be canvassed in a Phase 2 of the Discussion Paper.

## 11.1 QUEBEC STATUTES AND REGULATIONS

### **QUEBEC FISHERY REGULATIONS (CANADA)<sup>754</sup>**

The *Quebec Fishery Regulations* are federal regulations enabled by the *Canada Fisheries Act* in 1990. These Regulations apply to the management and control of fishing for freshwater fish and anadromous and catadromous species of fish throughout Quebec including in tidal waters.<sup>755</sup> However, tidal waters are defined to include the Gulf of St. Lawrence and Baie des Chaleurs in the east. Northern waters of James and Hudson Bays and Hudson Straight are excluded.

Like their counterparts in other provinces and territories, these Regulations address the issuance of licenses, size, possession and quota limits and various restrictions and prohibitions on fishing methods. This Act contains no reference to marine waters, habitat or any Key Blue Carbon Concepts and would be of limited usefulness for blue carbon sequestration efforts in the province.

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750. *James Bay and Northern Quebec Agreement* (1975), as amended.

751. *James Bay and Northern Quebec Native Claims Settlement Act*, S.C. 1976-77, c. 32

752. *Nunavik Land Claims Agreement* (2006), as amended.

753. *Nunavik Inuit Land Claims Agreement Act*, S.C. 2008, c. 2.

754. *Quebec Fishery Regulations* (Canada), SOR/90-214

755. *Quebec Fishery Regulations* (Canada), s. 3(1).

## **ACT RESPECTING COMMERCIAL AQUACULTURE<sup>756</sup>**

The *Act respecting commercial aquaculture* is a provincial statute enacted 2003. It applies to aquaculture conducted in waters occurring within the borders of Quebec.

Distinct from other jurisdictions, the Act addresses cultivation not only of animal species but also plants. Aquaculture is defined to include the cultivation or raising of aquatic organisms, in particular fish, amphibians, echinoderms, shellfish, crustaceans or plants, except organisms cultivated or raised for aquarium fishkeeping purposes.<sup>757</sup>

The Act permits aquaculture through a license system.<sup>758</sup> This Act authorizes the Government of Quebec to make regulations relating to any aspect of aquaculture.<sup>759</sup> These are discussed below. Further, the Act stipulates that “in keeping with the principle of sustainable development, establish regional or local aquaculture development frameworks to facilitate the ordered growth of aquaculture in the waters in the domain of the State. [...] The frameworks shall indicate, for given geographic sectors, the sites best suited for aquaculture [...]”.<sup>760</sup>

Beyond including plants within the definition and regulation of aquaculture, the Act does not include references to Key Blue Carbon Concepts.

## **COMMERCIAL AQUACULTURE REGULATION<sup>761</sup>**

The *Commercial Aquaculture Regulation* is a provincial regulation made pursuant to the *Act respecting commercial aquaculture* in 2008.

These Regulations outline two subclasses of licenses under which a person may carry on aquaculture activities. The first authorizes the carrying on of aquaculture in an artificial cultivation or raising unit, such as a basin or an artificial lake. The second permits the carrying on of aquaculture in a natural lake or watercourse, or offshore.<sup>762</sup> Offshore is not defined in either the Act or the Regulations. It may be reasonable to assume that offshore in this instance relates to the tidal waters as those are defined under the *Quebec Fishery Regulations* (i.e. not Hudson Bay, Hudson Strait or James Bay).

In the event that is incorrect, the Regulations have been reviewed for potential blue carbon ecosystem relevance. To that effect, section 28 does require the equipment and facilities used in the operation of an aquaculture site or fishing pond must be designed so that the premises may be maintained in the clean and safe state required to ensure the aquatic organisms remain healthy and innocuous and to prevent any hazard to the health or safety of the public, the environment and wildlife.<sup>763</sup>

These Regulations do not include references to Key Blue Carbon Concepts.

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756. *Quebec Act respecting commercial aquaculture*, A-20.2. [Quebec Commercial Aquaculture Act]

757. *Quebec Commercial Aquaculture Act*, s. 1.

758. *Quebec Commercial Aquaculture Act*, s. 4.

759. *Quebec Commercial Aquaculture Act*, s. 42.

760. *Quebec Commercial Aquaculture Act*, s. 2.

761. *Quebec Commercial Aquaculture Regulation*, A-20.2, r. 1.

762. *Quebec Commercial Aquaculture Regulation*, s. 1.

763. *Quebec Commercial Aquaculture Regulation*, s. 28.

### **ACT RESPECTING COMMERCIAL FISHING AND COMMERCIAL HARVESTING OF AQUATIC PLANTS<sup>764</sup>**

The *Act respecting commercial fishing and commercial harvesting of aquatic plants* is a provincial statute enacted in 2003. While the provisions relating to commercial fishing permits seem only to apply to “tideless waters”,<sup>765</sup> the commercial harvesting of aquatic plants does not seem to be so limited.

Generally, it is prohibited to “harvest aquatic plants on a commercial basis in the places determined by regulation unless the person holds a licence issued by the Minister.<sup>766</sup> However, the Minister must “issue a licence to every person who meets the conditions and pays the fee prescribed [...] and who complies with the norms respecting the quality of the environment and wildlife protection.<sup>767</sup>

There do not appear to be any Regulations made pursuant to this Act, which would provide more guidance on the limits placed on commercial aquatic plant harvests. Beyond addressing plants harvesting, the Act does not include references to Key Blue Carbon Concepts.

### **ACT TO AFFIRM THE COLLECTIVE NATURE OF WATER RESOURCES AND TO PROMOTE BETTER GOVERNANCE OF WATER AND ASSOCIATED ENVIRONMENTS<sup>768</sup>**

The *Act to Affirm the Collective Nature of Water Resources and to Promote Better Governance of Water and Associated Environments* is a provincial statute that was enacted in 2009. It applies throughout Quebec.

The Act characterises surface water and groundwater, in their natural state, as resources that are part of the common heritage of the Québec nation and the use of these waters is common to all.<sup>769</sup> The Act establishes a governance, research/knowledge and deterrence framework for water around four main principles: user/polluter pays, prevention, reparation and transparency.<sup>770</sup>

As part of the research/knowledge prong, “A water knowledge branch to be known as the Bureau des connaissances sur l’eau is established within the Ministère du Développement durable, de l’Environnement et des Parcs. The Bureau’s mission is to set up, and ensure the technical coordination of, an information system for the collection of data on water resources, aquatic ecosystems and water uses in the hydrologic units”.<sup>771</sup> Notably for organizations with potential interest in aquatic ecosystems in Quebec, research institutions or group whose activities relate to the water sector may, by invitation or at their request, be associated with the development of the information system.

As part of the transparency prong, a number of planning and reporting responsibilities are assigned to different bodies. Of particular relevance to blue carbon sequestration initiatives, the Minister must “prepare and submit to the Government the directions and objectives to be pursued to protect wetlands and bodies of water, so as to ensure and enhance the various benefits they bring, in particular [...] sequestering carbon and mitigating the impacts of climate change.”<sup>772</sup> Further, regional and regional county municipalities must submit wetlands and bodies of water plan must be submitted to the Minister for approval, after consultation with the ministers responsible for municipal affairs, agriculture, wildlife, energy and natural resources.<sup>773</sup> These were to be tabled by June 2022.

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764. *Quebec Act respecting commercial fishing and commercial harvesting of aquatic plants*, P-9.01. [Commercial Harvesting Act]

765. *Quebec Commercial Harvesting Act*, s. 3.

766. *Quebec Commercial Harvesting Act*, s. 13.

767. *Quebec Commercial Harvesting Act*, s. 14.

768. *Quebec Act to Affirm the Collective Nature of Water Resources and to Promote Better Governance of Water and Associated Environments*, (C-6.2). [*Quebec Governance of Water Act*]

769. *Quebec Governance of Water Act*, s. 1.

770. *Quebec Governance of Water Act*, s. 4.

771. *Quebec Governance of Water Act*, s. 16.

772. *Quebec Governance of Water Act*, s. 13.1.

773. *Quebec Governance of Water Act*, s. 17.

The regional county municipalities of Northern Quebec and West Quebec would be the relevant bodies for the purposes of this Discussion Paper. A wetland and water bodies plan could not be located (via online search in English and French) for these bodies. However, there may have been delays due to covid, etc. It may be a good idea to keep a watching brief for these plans as they would encompass wetland areas up to the high water mark of the Quebec coastline and could contain valuable data for these areas.

### **ENVIRONMENT QUALITY ACT<sup>774</sup> AND THE REGULATION RESPECTING ACTIVITIES IN WETLANDS, BODIES OF WATER AND SENSITIVE AREAS<sup>775</sup>**

The *Environment Quality Act* is a provincial statute. *The Regulation respecting activities in wetlands, bodies of water and sensitive areas* was made pursuant to this Act. These apply across Quebec with special treatment for the James Bay Cree and Northern Quebec Regions.

The preamble sets out the purpose of the Act thus: “to protect the environment and the living species inhabiting it, to the extent provided for by law. The Act makes it possible to take into consideration issues related to the protection of human health and safety as well as the realities of the territories and the communities living in them. The Act affirms the collective and public interest character of the environment, which is inseparable from its ecological, social and economic dimensions”.<sup>776</sup>

Significantly, the *Environment Quality Act* is divided between General Application provisions and “Provisions Applicable to the James Bay and Northern Quebec Region. The latter provisions will be best explained in Phase 2 of the Discussion Paper due to the necessary integration of these provisions with the JBNQA and the *Nunavik Agreement*.

In terms of Provisions of General Application that are relevant to the question of blue carbon ecosystem protection and recognizing the value of sequestration potential, the Act assigns the Minister broad authorities and responsibilities to carry out plans and programs for the conservation and management of the environment.<sup>777</sup> In particular, it is the responsibility of the Minister to elaborate and propose to the Government a protection policy for lakeshores, riverbanks, littoral zones and floodplains, to implement such policy and to coordinate its application.<sup>778</sup> The Minister also possesses broad regulation making authority over, among other things, prescribing “standards for the quality or quantity of surface water or groundwater that may be withdrawn [and...] the use of the water withdrawn and the preservation of the aquatic ecosystems or wetlands.”<sup>779</sup>

A division of the Act is dedicated to wetlands and water bodies. The purpose is to “foster integrated management of wetlands and bodies of water in keeping with the principle of sustainable development and considering the support capacity of the wetlands and bodies of water concerned and their watersheds, as well as climate change issues. One objective of this division is to prevent the loss of wetlands and bodies of water, foster development of projects with minimal impacts on the receiving environment and reduce the vulnerability of persons and property exposed to flooding”.<sup>780</sup>

The object of the Regulations is to prescribe general standards applicable to the carrying out of activities in wetlands and bodies of waters and in other sensitive areas as a supplement in particular to the rules prescribed by other statutes and regulations. It is uniquely focused on lakeshores and riverbanks, littoral zone and flood zones, rather than marine areas.<sup>781</sup>

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774. Regulation respecting activities in wetlands, bodies of water and sensitive areas, chapter Q-2, r. 0.1. [*Quebec Wetland Regulations*]

775. *Environment Quality Act*, Q-2.

776. *Environment Quality Act*, Preamble.

777. *Environment Quality Act*, s. 2.

778. *Environment Quality Act*, s. 2.1.

779. *Environment Quality Act*, s. 46(16)(f).

780. *Environment Quality Act*, s. 46.0.1.

781. *Quebec Wetland Regulations*, s. 4.



## **QUEBEC PARKS ACT<sup>782</sup> AND PARKS REGULATIONS<sup>783</sup>**

The *Quebec Parks Act* is a provincial statute that applies throughout Quebec. The *Parks Regulations* were made pursuant to the Act.

The Government, by regulation, may establish a park on any part of the lands in the domain of the State.<sup>784</sup> It is prohibited to hunt or trap, prospect, harvest or harness resources related to logging, mining or the production of energy, and lay of oil or gas pipelines or power lines, do other maintenance, development or construction work in or make changes to the grounds of a park.<sup>785</sup> The Government is authorized to make regulations on a range of matters relating to parks

The Regulations stipulate different zones within parks, including a “natural environment zone,” which means the part of the territory of a park reserved for the development of the natural and landscape heritage and characterized by a layout allowing accessibility; “maximum preservation zone” which means the part of the territory of a park exclusively reserved for the protection of the natural and landscape heritage and that is accessible only exceptionally; a “preservation zone,” which means the part of the territory of a park mainly reserved for the protection of the natural and landscape heritage and that is only accessible by means that have little impact on the environment [...].<sup>786</sup>

Neither the Act nor the Regulations reference Key Blue Carbon Concepts.

## **QUEBEC NATURAL HERITAGE CONSERVATION ACT<sup>787</sup>**

The *Quebec Natural Heritage Conservation Act* is a provincial statute, which underwent significant amendments in 2021. It applies throughout Quebec and provides for natural heritage and biodiversity protection measures through a framework for creating aquatic reserves, biodiversity reserves, ecological reserves and man-made landscapes, as well as for the recognition of nature reserves on private land.<sup>788</sup>

The Act is intended support three main objectives: first, the expansion of the network of areas covered by conservation measures in Québec and the efficient management of protected areas; second to allow citizens as well as local and Aboriginal communities to become more involved in the conservation of biodiversity, in particular in the creation and management of protected areas; and third, to ensure that the various government departments and bodies that assume biodiversity conservation related responsibilities collaborate in the selection, designation and management of protected areas.<sup>789</sup> The Act, like other conservation statutes discussed above employs a designation-by-regulation, activity and access prohibition and penalty system to achieve these objectives.

Under the Act, the Government may designate any land in the domain of the State as a protected area with sustainable use, a biodiversity reserve, an ecological reserve or a marine reserve.<sup>790</sup> The most likely candidates for blue carbon ecosystem protection are ecological reserves. The purpose of this designation is to conserve

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782. *Quebec Parks Act*, P-9.

783. *Quebec Parks Regulations*, chapter P-9, r. 25.

784. *Quebec Parks Act*, s. 2.

785. *Quebec Parks Act*, s. 7.

786. *Quebec Parks Regulations*, s. 2.

787. *Quebec Natural Heritage Conservation Act*, C-61.01.

788. Government of Quebec, *Natural Heritage Conservation Act* (accessed online: [https://www.environnement.gouv.qc.ca/biodiversite/aires\\_protegees/loi-conservation-patrimoine-naturel-en.htm](https://www.environnement.gouv.qc.ca/biodiversite/aires_protegees/loi-conservation-patrimoine-naturel-en.htm), November 22, 2022).

789. *Quebec Natural Heritage Conservation Act*, s. 1.

790. *Quebec Natural Heritage Conservation Act*, s. 27.

constituent elements of biological diversity in their natural state permanently and as fully as possible, in particular by protecting ecosystems and the elements or processes that ensure their dynamics; to reserve land for scientific study or educational purposes; or to protect the habitats of threatened or vulnerable plant and animal species.<sup>791</sup>

The conservation plan prepared for a protected area with sustainable use, biodiversity reserve, ecological reserve or marine reserve must include at least the following elements: (1) an ecological overview of the area concerned as well as a description of its occupation and uses; (2) conservation and development objectives for the area concerned; and (3) a map of the protected area.<sup>792</sup> The Minister is responsible for the implementation and updating of the conservation plan<sup>793</sup> and the Minister must keep a public register of these areas.<sup>794</sup>

While tools for protection of blue carbon ecosystems are available under this Act, the text does not require decision-makers to consider the sequestration value of blue carbon ecosystems. More generally, climate change seems to be viewed from an adaptation perspective rather than incorporating natural mitigation factors as well.

### **QUEBEC SUSTAINABLE DEVELOPMENT ACT<sup>795</sup>**

The *Quebec Sustainable Development Act* is a provincial statute that applies throughout Quebec. It was enacted in 2006 to “to establish a new management framework within the Administration to ensure that powers and responsibilities are exercised in the pursuit of sustainable development”.<sup>796</sup>

The Act provides a definition of sustainable development for its purposes: “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. It outlines 16 principles to guide the actions of the public service<sup>797</sup> and commits the government to adopting a sustainable development strategy for the entire government.<sup>798</sup> It assigns responsibility to the premier to table the strategy in the National Assembly and report on its progress every five years and requires departments to show progress toward its objectives.<sup>799</sup>

This outlines a solid accountability framework; but, no targeted approach to blue carbon ecosystem valuation or preservation. There are no references to Key Blue Carbon Concepts.

### **QUEBEC MIGRATORY BIRD SANCTUARIES (CANADA)**

There are twenty-eight Migratory Bird Sanctuaries established or continued in Quebec pursuant to the *Migratory Birds Convention Act*<sup>800</sup> - too many to list here.

As noted above, the *Migratory Bird Sanctuary Regulations* prohibit any activity that is harmful to migratory birds or the eggs, nests or habitat of migratory birds, except under authority of a permit.<sup>801</sup> The areas within these sanctuaries are protected by virtue of the protections afforded to the migratory birds that use those areas through

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791. *Quebec Natural Heritage Conservation Act*, s. 50.

792. *Quebec Natural Heritage Conservation Act*, s. 29.

793. *Quebec Natural Heritage Conservation Act*, s. 30.

794. *Quebec Natural Heritage Conservation Act*, s. 2.

795. *Quebec Sustainable Development Act*, D-8.

796. *Quebec Sustainable Development Act*, s. 1.

797. *Quebec Sustainable Development Act*, s. 6.

798. *Quebec Sustainable Development Act*, s. 7.

799. *Quebec Sustainable Development Act*, s. 7.

800. *Migratory Birds Convention Act*, S.C. 1994, c. 22

801. MBCR, s. 10(1).

the habitat services provided by blue carbon ecosystems. Notably, many of these areas straddle terrestrial/marine divide, helping to organize around any jurisdictional bifurcations that affect other areas of coastline.

While the *Migratory Birds Convention Act* may not provide targeted protection to blue carbon ecosystems, these protected areas have recognized the disregard that ecology shows for jurisdictional divides and they have been well-entrenched in federal law for decades. One MBS is of particular relevance to this Part of the Discussion Paper.

**The Boatswain Bay Migratory Bird Sanctuary (MBS):** Located north of Waskaganish in southeastern James Bay (Figure 22). This MBS encompasses part of the Boatswain Bay shore within two miles (approximately 3.2 km) of the high-water line, including all islands, water, shallow banks and rocks bounded by a straight line in Boatswain Bay between two points of land.<sup>802</sup> It is shared between Nunavut and Québec and Sanikiluaq is the nearest Nunavut community.

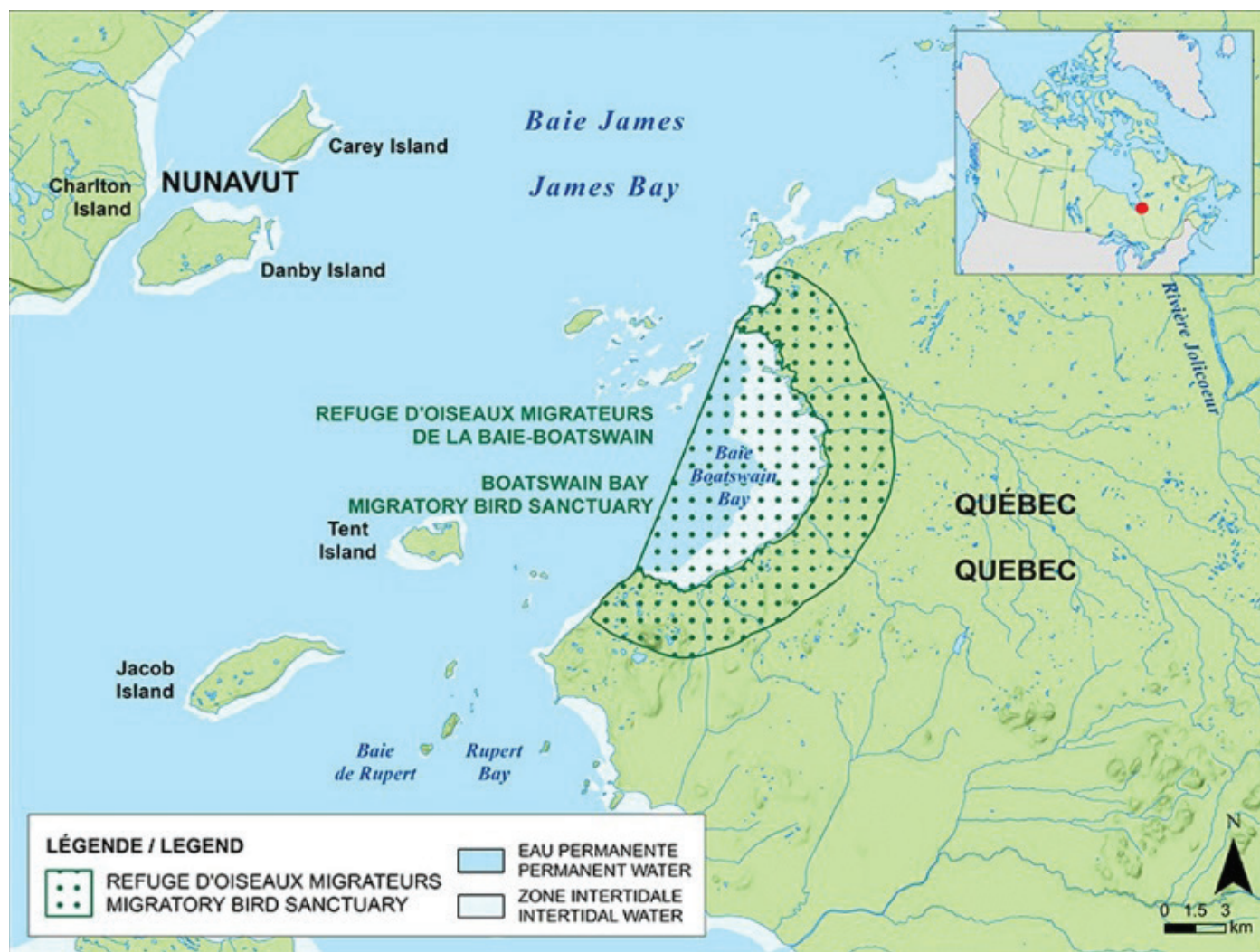


Figure 22. Map of the Boatswain Bay Migratory Bird Sanctuary

802. <https://www.canada.ca/en/environment-climate-change/services/migratory-bird-sanctuaries/locations/boatswain-bay.html>

## 10.2 QUEBEC POLICY MEASURES

### PLAN NORD AND NORTHERN ACTION PLAN 2020-2023

Plan Nord toward 2035, which was issued in 2015 sets out the following main objective: “the economic and social development of Québec’s territory north of the 49th parallel by the exploitation of natural resources, in accordance with the principles of sustainable development”.<sup>803</sup> This main objective is to be pursued through three strategic directions: 1. develop the diversified economic potential of northern Québec in a responsible way and for the benefit of the population living there and Québec as a whole; 2. support the development of all communities in the area covered by the Plan Nord, by helping them realize their full potential and enhancing their living conditions; and, 3. protect the environment and preserve the distinctive biodiversity of northern Québec by ensuring that mechanisms are put in place to dedicate 50% of the area covered by the Plan Nord, by 2035, to non-industrial purposes, protection of the environment and the safeguarding of biodiversity.<sup>804</sup>

Climate change is characterized as a threat to be adapted to rather than mitigated, including through the conservation of large proportions of the territory north of the 49th parallel. Plan Nord does not incorporate concepts of carbon sinks or sequestration. does not include other Key Blue Carbon Concepts.

The 2020-2023 Northern Action Plan (NAP) is linked to The Plan Nord toward 2035. It applies to the entire territory north of the 49th parallel. The NAP sets as its objective “to establish winning conditions to enable residents to fully inhabit their northern territory”.<sup>805</sup> The NAP supports four directions: 1. Optimized access to the northern territory; 2. A robust and diversified economic fabric; 3. An attractive, dynamic living environment; and, A northern environment to be preserved.

With respect to environmental considerations, the NAP is organized around three main elements: bolster environmental protection, clean up environments and roll out the circular economy. The NAP sets out its conservation target under the first element: “The 2020-2023 NAP is consolidating the commitment to designate by 2035 50% of the territory north of the 49th parallel for conservation purposes. A network of protected areas representing 20% of the northern territory will be strengthened and 30% of the territory will be devoted to environmental protection, safeguarding biodiversity, and the promotion of various types of development”.<sup>806</sup> Beyond this conservation objective, which could indirectly support blue carbon ecosystems, the NAP does not reference Key Blue Carbon Concepts.

### 2030 PLAN FOR A GREEN ECONOMY<sup>807</sup>

The 2030 Plan for a Green Economy is focused primarily on developing Quebec’s hydro energy potential – both for domestic use and international supply. This does not an easy fit for a blue carbon sequestration discussion; but, we thought it was worth quickly reviewing in any case. It turns out there is an honourable mention that a smart environmental group could work with.

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803. Government of Quebec, *Plan Nord toward 2035* (2015).

804. Plan Nord, p.

805. Government of Quebec, *2020-2023 Northern Action Plan* (accessed online: <https://www.quebec.ca/en/government/departments-and-agencies/societe-plan-nord>, November 22, 2022), p. 6.

806. NAP, p. 27.

807. Government of Quebec, *Electrification and Climate Change Policy Framework, 2030 Green Economy Plan* (accessed online: <https://cdn-contentu.quebec.ca/cdn-contenu/adm/min/environnement/publications-adm/plan-economie-verte/plan-economie-verte-2030-en.pdf>, November 22, 2022).

Quebec's approach to climate change mitigation is threefold:

1. **Avoid** creating new greenhouse gases as much as possible and prevent the destruction of natural carbon pools.
2. **Reduce** existing greenhouse gas emissions and limiting the degradation of natural carbon pools.
3. **Sequester** using carbon capture and storage technologies so that they cannot harm the climate. The biological sequestration of carbon can also be increased by creating new carbon pools, particularly in forests.<sup>808</sup>

Natural environments are viewed in the 2030 Plan as a potential means to sequester carbon and a risk factor in terms of their disruption through human activity. The Plan commits to valuing natural environments (again, such as forests) for their sequestration abilities.<sup>809</sup> The Plan states: "Humans have little direct, short-term influence on the carbon sequestration capacities of the oceans and large wilderness areas. However, we can affect the carbon sequestration capabilities of wetlands and forests. The conservation of natural environments (particularly wetlands) through measures like the network of protected areas and the environmental legal framework helps maintain carbon storage and biodiversity across Québec".<sup>810</sup> It appears, that Quebec has acknowledged the marine region as a potential carbon sequestration resource, though the means to conduct this accounting has not yet been thoroughly described, at least, in this policy space.

## DISCUSSION PAPER PHASE 1: INTERIM OBSERVATIONS & RECOMMENDATIONS

Although a comprehensive framework for blue carbon ecosystem support will only emerge following the completion of Phase 2 of this Discussion Paper, a number of observations and takeaways are worth noting at this midway point.

### NORTH OF 60 ° ECOSYSTEM INTERIM OBSERVATIONS

As noted through the blue carbon ecosystem knowledge sections data gaps remain regarding quantification of carbon mass in each ecosystem and within each ecosystem species blue carbon quantification. Sequestered carbon stocks in abiotic compartments are also woefully underrepresented current calculations. Finally, whereas in temperate regions management measures exist to protect standing and blue carbon in the Arctic few options exist that are within the control of the regional governments rather global climate action is required to halt climate impacts in the Arctic and in turn protect sequestered and new carbon stocks. Without strong national and global regulation and action to reduce climate impacts Arctic blue carbon, the Arctic is in danger of becoming a source of atmospheric carbon rather than a sink. Efforts are required to fully understand how much blue carbon exists in the Canadian Arctic, where it is, where is it vulnerable and how to keep it there.

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808. Government of Quebec, (accessed online: <https://cdn-contenu.quebec.ca/cdn-contenu/adm/min/environnement/publications-adm/plan-economie-verte/plan-economie-verte-2030-en.pdf>, November 22, 2022), p.33.

809. 2030 Green Economy Plan, p. 57.

810. 2030 Green Economy Plan, p. 61.



## NORTH OF 60 ° ECOSYSTEM INTERIM RECOMMENDATIONS

Although a final set of recommendations for blue carbon ecosystem support will only emerge following the completion of Phase 2 of this Discussion Paper, a few recommendations can be advanced at this stage:

- Indigenous led conservation and the co-production of knowledge facilitates effective ecological stewardship and the creation of the most comprehensive knowledge. It is recommended that any and all research and management measures that take place within or affect the Arctic, to the degree welcomed by Indigenous rights holders, be integrated with their priorities, governance structures, knowledge and values.
- Inuit Nunangat, Hudson Bay and James Bay host the vast majority of Canada's coastline and the aquatic ecosystems that occur there. It is recommended that, in coordination with Indigenous knowledge holders, field studies be advocated, funded and coordinated for this region. There are extensive knowledge gaps in western science regarding coastal ecosystems along the Canadian Arctic coast, especially in the Arctic basin and Canadian Arctic Archipelago. These gaps not only relate to the extent and biomass of coastal ecosystems, but also the standing carbon stocks, rates of carbon sequestration, and rates of carbon export and burial of these coastal ecosystems. All of which are imperative to create accurate and appropriate valuations and management decisions.
- Emerging research indicates that a majority of Canada's mapped salt marsh is located along the Arctic coast and eelgrass meadows have been observed near settlements in the Northwest Territories and Nunavut. It is recommended that future advocacy work to recharacterize this region as one that hosts productive marine plant life rather than merely tundra and ice-covered sea.

## NORTHERN FEDERAL, TERRITORIAL, PROVINCIAL LAW & POLICY INTERIM OBSERVATIONS

Phase 1 Discussion Paper focuses solely on current FPT laws and policies that *may* be relevant to blue carbon ecosystems in Yukon, NWT, Nunavut, Manitoba, Ontario, and Quebec. While in some cases these laws and policies reflect treaties and Indigenous rights, this first part of the Discussion Paper does not explicitly analyse how existing Indigenous rights, governance structures and environmental management frameworks are being or could be used to support blue carbon ecosystems. Stated previously, focused study of these frameworks is fundamental to any discussion about recognizing and supporting blue carbon ecosystems in this region. Local Inuit and First Nations communities are uniquely placed to understand the locations, status and holistic value of blue carbon ecosystems. Further, in varying degrees, their respective treaties have been designed to account for logical interactions with the environment rather than on the basis of jurisdictional boundaries born out of politics. There may be real hope there for eelgrass, kelp, salt marshes and coastal wetlands. These frameworks will be analyzed in Phase 2 Discussion Paper.

Acknowledging limited perspective of this Phase 1, the overarching observation that emerges is that blue carbon ecosystems and their role as carbon sinks have not been integrated in any express or targeted way into statutes or regulations in any of the jurisdictions studied. A determined advocate could link protection of these ecosystems to their role as habitat for protected species such as migratory birds or the inclusion of "plants" in the definitions relevant to protected spaces, such as wilderness parks. Beyond this protection-by-extension, however, these jurisdictions have yet to acknowledge in law the role or value of these ecosystems qua carbon sequestration.

At the policy level, the northern-most coastlines continue to be characterized as vast expanses of tundra and ice-covered sea rather than areas where kelp forests might thrive. References to naturally occurring carbon sequestration are largely focused on terrestrial examples such as forests and occasionally wetlands and

peatlands. Further, general references to ecosystems that could include carbon-sequestering marine plants typically identify these as environments vulnerable to climate change impacts rather than resources for mitigating the prevalence of greenhouse gas emissions in the atmosphere. None of the studied jurisdictions has published a strategy for supporting blue carbon sequestration capacity.

As noted in previous discussion papers, the onshore-offshore divide between territorial/provincial and federal jurisdictions complicates the description of the law and policy frameworks and the development of strategy to bolster the protection of blue carbon ecosystems within them. However, certain protected areas such as Parks and Migratory Bird Sanctuaries, which encompass tidal areas could be used as guides for cooperatively developing zones of protection for these ecosystems. Further, the comparatively low level of human activity currently and the relative prevalence of protected areas may provide a lower-risk space for collaboration between FPTs and, as will be discussed in Phase 2, treaty partners.

## **NORTHERN FEDERAL, TERRITORIAL, PROVINCIAL LAW & POLICY INTERIM RECOMMENDATIONS**

- The Inuit-Crown treaties that span Inuit Nunangat and the historic treaties of Hudson Bay and James Bay are necessarily central to any blue carbon strategy for this region. It is recommended that analysis of these treaty and Indigenous rights frameworks continue in a second phase of work that will complement this first phase.
- Northern jurisdictions have begun to take a more collaborative approach to policy and legislative development particularly in the intersecting realms of wildlife, environment and climate change. It is suggested that these processes are an opportunity to educate policy makers about the value of blue carbon ecosystems vis-à-vis carbon sequestration and the potential risk in their disturbance.
- The review demonstrated potential opportunities for “protection-by-extension” through legally protected species and spaces. It is recommended that a catalogue of protected species that use blue carbon ecosystems as habitat and spaces that include blue carbon ecosystems be developed. This would permit more effective tracking of potential threats and responsive advocacy.
- Land use planning can be a powerful tool for requiring close consideration of the impacts of certain development decisions. It is recommended that opportunities to participate in such processes, for example the Nunavut Land Use Plan, be taken. The objective would be to include blue carbon ecosystems as inherently valued components under land use designations.
- Environmental rights legislation offers opportunities for citizens to notify responsible officials and bring action for perceived and potential violations of their right to a healthy environment. In order for this to be an effective tool for blue carbon ecosystem protection, citizens must understand the role of these ecosystems in the overall health of their environment. It is recommended that education campaigns, designed in coordination with Indigenous rights holders and government departments be delivered in these jurisdictions.

# APPENDIX A – SNAPSHOT OF KEY LAWS POLICIES & MEASURES

Jurisdiction	Total # Laws/ Policies/ Measures Reviewed	Titles	Notable Aspects
Federal	21	<i>Canada Impact Assessment Act</i>	This may provide an avenue for WWF-Canada to support Indigenous and other jurisdictions prepare project-specific studies relating to impacts on blue carbon ecosystems that can then form part of an impact assessment. Strategic and regional assessments are tools that can be used to incorporate considerations about blue carbon ecosystems into impact assessment and other review processes.
		<i>Canada Fisheries Act</i>	At the federal level, due to its scope of application and purposes, the Canada Fisheries Act is central to any discussion about blue carbon sequestration. - The 2019 Policy Statement lists habitat degradation, including the impairment of <u>ecological functions</u> , and modification among interrelated factors that threaten fish habitat. This would present an opportunity to identify blue carbon sequestration as an ecological function, which could open the door for protecting marine plants uniquely for those functions. - Bill C-68 also introduced into the <i>Fisheries Act</i> the authority to designate “ecologically significant areas”, however regulations establishing such an area have not been promulgated. Additional steps may be required for this authority to prove effective in blue carbon protection.
		<i>Fishery (General) Regulations and pursuant acts and regulations</i>	Of limited utility for protecting blue carbon ecosystems as they do not refer to habitat, plants, or blue carbon.

	<i>Canada Aquatic Invasive Species Regulations</i>	The regulatory framework for aquatic invasive species does not currently target aquatic plants but could through legislative amendment process and Ministerial discretion.
	<i>Arctic Waters Pollution Prevention Act</i>	While this Act may have a general positive impact on blue carbon ecosystems, it does not do so in a targeted way.
	<i>Canada National Marine Conservation Areas Act</i>	The NMCA Act authorizes the establishment of National Marine Conservation Areas by order of the Governor in Council. The Tallurutiup Imanga NMCA is the only NMCA discussed in this paper, located in Lancaster Sound, Nunavut. In 2021, Canada committed to establishing 10 new marine and four new freshwater NMCAs over the following five years. This could be an opportune time to identify blue carbon ecosystems as areas worthy of designation as NMCAs.
	<i>Canada National Parks Act</i>	The Act does have potential for protecting blue carbon ecosystems, particularly in the larger park areas established in the Arctic and northern regions. A number of the National Parks listed in Schedule 1 of the Act abut the arctic coastline beginning at the ordinary low water mark and expanding inland. Through designation and regulation these tidal areas could be subject to specific blue carbon protections.
	<i>Canada Wildlife Act</i>	Similar to other legislation, a link between a blue carbon ecosystem and habitat for a protected species must be established before protections can be activated.

	<p><i>Oceans Act</i></p>	<p>One of the Act’s objectives is to promote the wide application of the precautionary approach to the conservation, management and exploitation of marine resources in order to protect these resources and preserve the marine environment. MPAs are a key avenue for blue carbon ecosystem protection as they apply to marine environments where seaweed grows and do not rely on the establishment of a habitat link to another protected species. If blue carbon is characterised as a marine resource, then an argument can be made that authority lies for the Governor in Council to establish an MPA under section 35(3)(a) on the basis of its protection pursuant to the reason set out under section 35(1)(e).</p>
	<p><i>Species at Risk Act</i></p>	<p>SARA defines wildlife species as a “species, subspecies, variety or geographically or genetically distinct population of animal, <u>plant</u> or other organism, other than a bacterium or virus, that is wild by nature [...]”. If a plant in a blue carbon ecosystem is listed in the Schedule, it is granted the protections under the Act directly rather than merely through its role as habitat provider. Critical habitat that belongs to any listed endangered or threatened species is also protected from destruction under SARA on federal lands, within the EEZ or on the continental shelf, <u>where the species is listed as aquatic</u>, or where it is a migratory bird sanctuary.</p>
	<p><i>Migratory Bird Convention Act</i></p>	<p>MBS offer a potential model for protection of blue carbon-as-habitat in intertidal and interjurisdictional areas in the Arctic.</p>
	<p><i>Blue Carbon in Canada: A Federal Policy Review</i></p>	<p>More than ably covers the subject matter we proposed for this section and covers extensive cross section of documents from Fisheries and Oceans Canada, Environment and Climate Change Canada, Infrastructure Canada, Transport Canada, Impact Assessment Agency of Canada, Government of Canada, and the Indigenous Circle of Experts.</p>



		<p><i>Inuit Nunangat Declaration, Inuit Nunangat Policy and Inuit-Crown Guidance</i></p>	<p>While not immediately relevant to blue carbon sequestration, the Declaration created the space for jointly developing policies, strategies and guidance in a range of spaces, including the marine environment.</p> <p>For any initiative relating to blue carbon ecosystems in Inuit Nunangat, Inuit will be directing minds and equal participants in that process.</p> <p>It will be important to keep an eye open for further guidance documents and strategies from the ICPC in the coming years, particularly regarding environment and climate change.</p>
		<p><i>Government of Canada Guidance for Recognizing Marine Other Effective Area-Based Conservation Measures (2022)</i></p>	<p>As the 2022 OECM Guidance notes, "<u>OECMs may be used to protect areas important for carbon sequestration and provide other adaptation and mitigation benefits as part of a nature-based solution to climate-change impacts</u>". Support for climate change adaptation and mitigation, including carbon sequestration is recognized as a biodiversity conservation benefit. Blue carbon ecosystems could satisfy the "benefit for an important habitat" criterion.</p>
<p><b>Yukon</b></p>	<p>19</p>	<p><i>Yukon Environmental and Socio-economic Assessment Act</i></p>	<p>The evaluated categories do not exclude blue carbon ecosystems, though, neither these categories nor the Regulations reference climate change mitigation or carbon sequestration specifically. Unless a decision-maker is already versed in blue carbon sequestration potential, its consideration would not be guaranteed.</p> <p>Two tools that may be used to incorporate blue carbon ecosystems into impact assessment decision-making are regional land use plans and mitigative measures.</p>

	<i>Yukon Act (Canada)</i>	<p>Most relevant to blue carbon ecosystems, the Yukon Legislature may make laws in relation to the conservation of wildlife and its habitat, other than in a federal conservation area; waters, other than waters in a federal conservation area, including the deposit of waste in those waters. Limiting the scope of this territorial authority in terms of blue carbon initiatives, Ivvavik National Park, which constitutes a federal conservation area under the <i>Yukon Act</i>, encompasses the western half of the Yukon coastline. Initiatives regarding blue carbon ecosystems in Yukon will necessarily be a cooperative effort between the federal, territorial and Inuit governing organizations at minimum.</p>
	<i>Yukon Waters Act and Waters Regulation</i>	<p>While the Act and Regulations provide for careful treatment of drainages into the Beaufort Sea, where blue carbon ecosystems occur, the protections afforded are general in nature and do not require specific evaluation of blue carbon impacts.</p>
	<i>Parks and Land Certainty Act</i>	<p>Like the <i>National Parks Act</i>, this statute provides protection tools that could be applied to blue carbon ecosystems. Blue carbon ecosystems could fit within the categories: an ecological reserve, a natural environment park or a wilderness preserve. The Commissioner in Executive Council's regulation-making authority is broad and could provide robust protections at least to the low water mark line on the coast of the Beaufort Sea.</p>
	<i>Herschel Island Park Regulations</i>	<p>The Plan does not specifically reference any Key Blue Carbon Concepts. However, it provides fairly broad protections benefitting the entire area of Herschel Island and all of the flora and fauna that live there. While blue carbon ecosystems are not specifically protected, they could be characterized as incidental beneficiaries. Given the collaborative management planning processes and research structures, Herschel Island may also provide opportunities for research and monitoring.</p>

	<p><i>Yukon Wildlife Act and Regulations</i></p>	<p>Under the Regulations, Ts'alwnjik Chu - Nordenskiold Wetland Habitat Protection Area has been designated. However, no such areas have been established in a blue carbon ecosystem zone. Like fishery and conservation statutes discussed above, protection under this act is limited to the role of blue carbon ecosystems as habitat or incidental residents of areas critical to protected species.</p>
	<p><i>Withdrawal from Disposition of Certain Yukon Oil and Gas Lands (Yukon North Slope) Order, Prohibition of Entry on Certain Lands (Yukon North Slope) Order, and Withdrawal of Certain Lands from Disposal (Yukon North Slope) Order</i></p>	<p>Provides general protection from industrial interference in this area.</p>
	<p><i>Draft policy for the stewardship of Yukon's wetlands</i></p>	<p>Carbon storage and release are listed as functions of wetlands and influencing atmospheric carbon and climate change as a benefit that can be derived from wetlands. Such a designation could result in special consideration for these areas during planning processes and environmental assessments. The criteria against which a potential wetland would be assessed, however, does not include carbon sequestration potential. Contributions to biodiversity and critical habitat, along with social or cultural importance for Yukon First Nations surface as the priorities supported through this policy.</p>
	<p><i>Our Clean Future: A Yukon strategy for climate change, energy and a green economy</i></p>	<p>Although blue carbon is not currently mentioned, an engagement process in the future would be an opportunity to incorporate Key Blue Carbon Concepts.</p>

		<p><i>Ecosystems of the Yukon Arctic Region: A Guide to Identification</i></p>	<p>Suggests the Yukon Arctic regions is important data gap that may hinder blue carbon ecosystem knowledge and support initiatives. This is a possible research support opportunity in the region.</p>
		<p><i>Management Plan for Yukon Amphibians</i></p>	<p>This could overlap with blue carbon ecosystem protection efforts through wetlands and initiatives could be used to manage blue carbon ecosystems as well.</p>
<p><b>Northwest Territories</b></p>	<p>23</p>	<p><i>NWT Environmental Protection Act</i></p>	<p>The <i>NWT EPA</i> prohibits the discharge of contaminants into the “environment”, subject to a list of exceptions. This would encompass any blue carbon ecosystems within NWT, arguably regardless of their onshore/offshore location. Actions taken under this Act to deter the deposit deleterious substances into locales where blue carbon ecosystems might be found is a general support. However, the broad exemption authority and lack of any reference to blue carbon ecosystems as a valued component of the NWT environment weaken even this amount of protection. The Act does not directly reference Key Blue Carbon Concepts.</p>
		<p><i>NWT Protected Areas Act</i></p>	<p>The Act has broad coverage of environmental components and systems thanks to inclusive terms. these terms are broad enough to include blue carbon ecosystems within the ambit of the NWT PAA. While none of currently protected areas cover blue carbon lands, the tools in this Act could be used, subject to the IFA, to create a layer of protection for these ecosystems.</p>
		<p><i>NWT Wildlife Act</i></p>	<p>The Act is centered around the conservation of wildlife. As such, the protection of blue carbon ecosystems under the NWT WA must rely on the terrestrial or amphibian residents of those ecosystems.</p>

	<i>NWT Waters Act and NWT Waters Regulations</i>	This Act applies a system of thresholds, use types, licenses and prohibitions to the use of waters and the deposit of waste in waters. These systems could impact blue carbon ecosystems along the coasts of the Beaufort Sea and Arctic Oceans where they exist and would be subject to the protections under the Act.
	<i>NWT Territorial Parks Act and NWT Territorial Parks Regulations</i>	Most likely to be relevant to blue carbon ecosystem protection, Cultural Conservation Areas “may be developed to protect the culturally significant site or landscape, and industrial activity may be prohibited”. However, beyond establishing authorities for area-based protections, this Act does not specifically address factors that may threaten blue carbon ecosystems or reference Key Blue Carbon Concepts.
	<i>Anguniaqvia niqiqyuam Marine Protected Areas Regulations (ANMPA Regulations)</i>	These facets of the management, monitoring and oversight of the ANMPA would be discussed in a Phase 2 Discussion Paper.
	<i>NWT Migratory Bird Sanctuaries (Canada)</i>	Ecosystems within these sanctuaries are protected by virtue of the protections afforded to the migratory birds that use those areas through the habitat services provided by blue carbon ecosystems.
	<i>Statement of Environmental Values</i>	The SEV incorporates the principles enunciated in the <i>NWT ERA</i> , including those identified above to have a bearing on blue carbon ecosystems (precautionary, polluter pay, intergenerational equity and ecological sustainability).
	<i>Land Use Planning, Protected and Conserved Areas</i>	There are currently no references to marine coasts, plants, habitat or any other Key Blue Carbon Concepts. As these new frameworks develop, it may be an opportune time to incorporate blue carbon concepts, which have been largely invisible to date in the law and policy environments.



		<p><i>2030 NWT Climate Change Strategic Framework &amp; 2019-2023 Climate Change Action Plan (2019)</i></p>	<p>The Action Plan identifies determining the potential value of natural carbon sinks and Undertaking work to estimate carbon stored in NWT ecosystems as both a Goal and Action Item. However, the only reference to sequestration potential in the NWT Climate Change Strategy relates to forests.</p>
<p><b>Nunavut</b></p>	<p>13</p>	<p><i>“Nunavut” Fisheries Regulations</i></p>	<p>Although this engagement process is now closed, this may present an opportunity to incorporate some of the holistic elements seen in the <i>Wildlife Act</i> to marine plants as vital blue carbon resources.</p>
		<p><i>Nunavut Environmental Protection Act</i></p>	<p>The Act does not directly reference Key Blue Carbon Concepts. However, environment is defined broadly and encompasses any blue carbon ecosystems within NU, arguably regardless of their onshore/offshore location. Actions taken under this Act to deter the deposit deleterious substances into locales where blue carbon ecosystems might be found is a general support. However, the broad exemption authority and lack of any reference to blue carbon ecosystems as a valued component of the Nunavut environment weaken even this amount of protection.</p>
		<p><i>Nunavut Territorial Parks Act and Nunavut Territorial Parks Regulations</i></p>	<p>While still centered on human experience, most relevant to blue carbon ecosystem protection, are likely Natural Environment Recreation Parks, which are designed to <u>preserve the natural environment</u> in those parks for the benefit, education and enjoyment of the public. Beyond establishing authorities for area-based protections, the Nunavut TPA and the TP Regulations does not specifically address factors that may threaten blue carbon ecosystems or reference Key Blue Carbon Concepts.</p>

		<i>Nunavut Wildlife Act</i>	This Act <u>does not</u> apply to a marine plant, as defined in section 47 of the Fisheries Act (all benthic and detached algae, marine flowering plants, brown algae, red algae, green algae and phytoplankton). As such, if all species that constitute blue carbon ecosystems fall within the marine plant category, the protections afforded under this Act are will only be accessible, through the habitat service blue carbon ecosystems provide.
		<i>Nunavut Conservation Areas Regulations</i>	Where blue carbon ecosystems overlap with Conservation Areas– and perhaps form part of the habitat – they will receive the habitat-specific protections for critical habitat under the Act.
		<i>Nunavut Land Use Planning</i>	Blue carbon and/or sequestration is not referenced anywhere in these documents or the LUP, however, under the Draft Land Use Plan there are three land use designations: Limited Use Areas, Conditional Use Areas and Mixed-Use Areas, with the former two providing the kinds of protections that might be sought for blue carbon ecosystems.
		<i>Nunavut Migratory Bird Sanctuaries (Canada)</i>	The areas within these sanctuaries are protected by virtue of the protections afforded to the migratory birds that use those areas through the habitat services provided by blue carbon ecosystems.
<b>Manitoba</b>	11	<i>Wapusk National Park (Canada)</i>	This park includes tidal flats, which, if climatic conditions are conducive, could encompass large areas of blue carbon ecosystems within the <i>National Parks Act</i> and <i>National Parks Regulations</i> .
		<i>Manitoba Wildlife Act</i>	While this Act is wildlife-centric, its provisions are broad enough to include blue carbon ecosystems where a link with a species of wildlife can be established. It would require a great deal of legislative work, however, in the establishment of designated areas. Beyond habitat, the Act does not reference Key Blue Carbon Concepts.

		<i>Manitoba Provincial Parks Act and Manitoba Park Parks Designation Regulation</i>	Currently no provincial parks bordering Hudson Bay. However, wilderness parks designations with strategically placed wilderness land use categories could be considered as tool for blue carbon sequestration adjacent to the Wapusk National Park. Beyond environment and water, the Act does not reference Key Blue Carbon Concepts.
		<i>Endangered Species and Ecosystems Act and Regulations</i>	The orientation of this Act aligns well with blue carbon ecosystem protection efforts in its purpose <u>to conserve and protect endangered and threatened ecosystems in the province and promote the recovery of those ecosystems.</u> <u>However,</u> it does not list blue carbon resources among the endangered and threatened ecosystems.
		<i>Manitoba Climate and Green Plan Act</i>	This Act provides for dedicated planning, monitoring, reporting and oversight of carbon as a driver of climate change. However, it prioritizes the reduction of greenhouse gas emissions and does not consider or assign value to naturally occurring carbon sinks within the province. What is not clear from looking at the legislation alone is whether carbon released through the destruction of carbon sinks (blue or otherwise) would be measured. In any event, this Act is likely most useful in terms of the dialogue it provides for through the planning and reporting processes.
		<i>Made-in-Manitoba Climate and Green Plan, 2017</i>	While the planning promise could provide a live venue for discussions regarding the value and vulnerability of blue carbon ecosystems, Hudson Bay does not appear to be an integral part of the 2017 Plan. The Manitoba Government may benefit from additional data and information to incorporate this into the dialogue.
<b>Ontario</b>	28	<i>Ontario Conservation Land Act</i>	For this to work as a tool for blue carbon ecosystem conservation, such lands would need to be privately owned. Further research would be needed to understand whether any titles are registered for areas (or parts of areas) where such ecosystems occur.

	<i>Conservation Authorities Act</i>	Jurisdiction appears to reach to the ordinary low water mark along Hudson Bay and James Bay, which could extend application of this Act to some blue carbon assets. Unfortunately, no Conservation Authorities have been established adjacent to Hudson Bay or James Bay. However, the Indigenous communities along the coast of James Bay, for example, could consider establishing such an authority and use it to receive funds and exercise certain decision-making authority over the watersheds in their areas.
	<i>Ontario Environmental Assessment Act</i>	Significant for blue carbon ecosystem application, water is defined as surface water and ground water, or either of them, but not marine water. While the Act may not be specifically relevant, the processes under this Act for proposals on provincial lands would be relevant where coastal development is planned.
	<i>Ontario Far North Act</i>	Objectives of the act include the protection of ecological systems in the Far North by various means, including the designation of protected areas in community-based land use plans and the maintenance of biological diversity, ecological processes and ecological functions, including the storage and sequestration of carbon in the Far North. <u>All plans must consider “the maintenance of biological diversity, ecological processes and ecological functions, including the storage and sequestration of carbon in the Far North.”</u> First Nations concerned about carbon sequestration could use the planning and designation processes under this Act to extend real protections – at least to the ordinary low water mark – of blue carbon ecosystems in the Far North region.
	<i>Ontario Planning Act</i>	This Act outlines a general planning process and does not specifically target blue carbon ecosystems. However, where local councils have an interest, there exist land use planning tools that could be employed to designate blue carbon ecosystem areas – at least to the low water mark – for restricted activities.

		<i>Ontario Fish and Wildlife Conservation Act and Ontario Fish Licensing Regulations</i>	Both the Act and these Regulations are focused on kingdom animalia. Ecosystems are only an object of protection through wildlife. Otherwise, habitat, plant species and other Key Blue Carbon Concepts are not referenced at all.
		<i>Ontario Endangered Species Act, Species at Risk in Ontario List and Habitat Regulations</i>	If it could be established that a species of plant involved in a blue carbon ecosystem is rooted above the low water and is extirpated, endangered or threatened, these instruments could be useful. A closer look at all of the listed species and their ranges would be a productive first step.
		<i>Ontario Provincial Parks and Conservation Reserves Act</i>	From the perspective of blue carbon ecosystem protection perspective, Wilderness Park and Natural Reserve Park classifications offer the greatest level of protection. However, beyond general protections, there are no references to Key Blue Carbon Concepts.
		<i>Ontario Migratory Bird Sanctuaries (Canada)</i>	The areas within these sanctuaries are protected by virtue of the protections afforded to the migratory birds that use those areas through the habitat services provided by blue carbon ecosystems.
		2020 Provincial Policy Statement	Neither Hudson nor James Bay coastal wetlands are included in these descriptions. Perhaps with more awareness about the critical role blue carbon ecosystems and their lowland neighbours play, these areas could be incorporated into this policy scheme.
		<i>A Wetland Conservation Strategy for Ontario (2017-2030)</i>	This strategy provides helpful statistics for the blue carbon sequestration toolkit, such as “in Ontario, the majority of wetlands are found in northern Ontario, with the Hudson Bay Lowlands Ecozone accounting for 20,000,000 hectares or about 57 per cent of Ontario’s wetlands.”
	<b>Quebec</b>	14	<i>Act to Affirm the Collective Nature of Water Resources and to Promote Better Governance of Water and Associated Environments</i>



	Quebec Natural Heritage Conservation Act	Under the Act, the Government may designate any land in the domain of the State as a protected area with sustainable use, a biodiversity reserve, an ecological reserve or a marine reserve. The most likely candidates for blue carbon ecosystem protection are ecological reserves. While tools for protection of blue carbon ecosystems are available under this Act, the text does not require decision-makers to consider the sequestration value of blue carbon ecosystems.
	Quebec Migratory Bird Sanctuaries (Canada)	The areas within these sanctuaries are protected by virtue of the protections afforded to the migratory birds that use those areas through the habitat services provided by blue carbon ecosystems.
	Plan Nord and Northern Action Plan 2020-2023	The NAP sets out its conservation target under the first element: “The 2020-2023 NAP is consolidating the commitment to designate by 2035 50% of the territory north of the 49th parallel for conservation purposes. A network of protected areas representing 20% of the northern territory will be strengthened and 30% of the territory will be devoted to environmental protection, safeguarding biodiversity, and the promotion of various types of development”. Beyond this conservation objective, which could indirectly support blue carbon ecosystems, the NAP does not reference Key Blue Carbon Concepts.
	2030 Plan for a Green Economy	Natural environments are viewed in the 2030 Plan as a potential means to sequester carbon and a risk factor in terms of their disruption through human activity. The Plan commits to valuing natural environments (again, such as forests) for their sequestration abilities. It appears, that Quebec has acknowledged the marine region as a potential carbon sequestration resource, though the means to conduct this accounting has not yet been thoroughly described, at least, in this policy space.