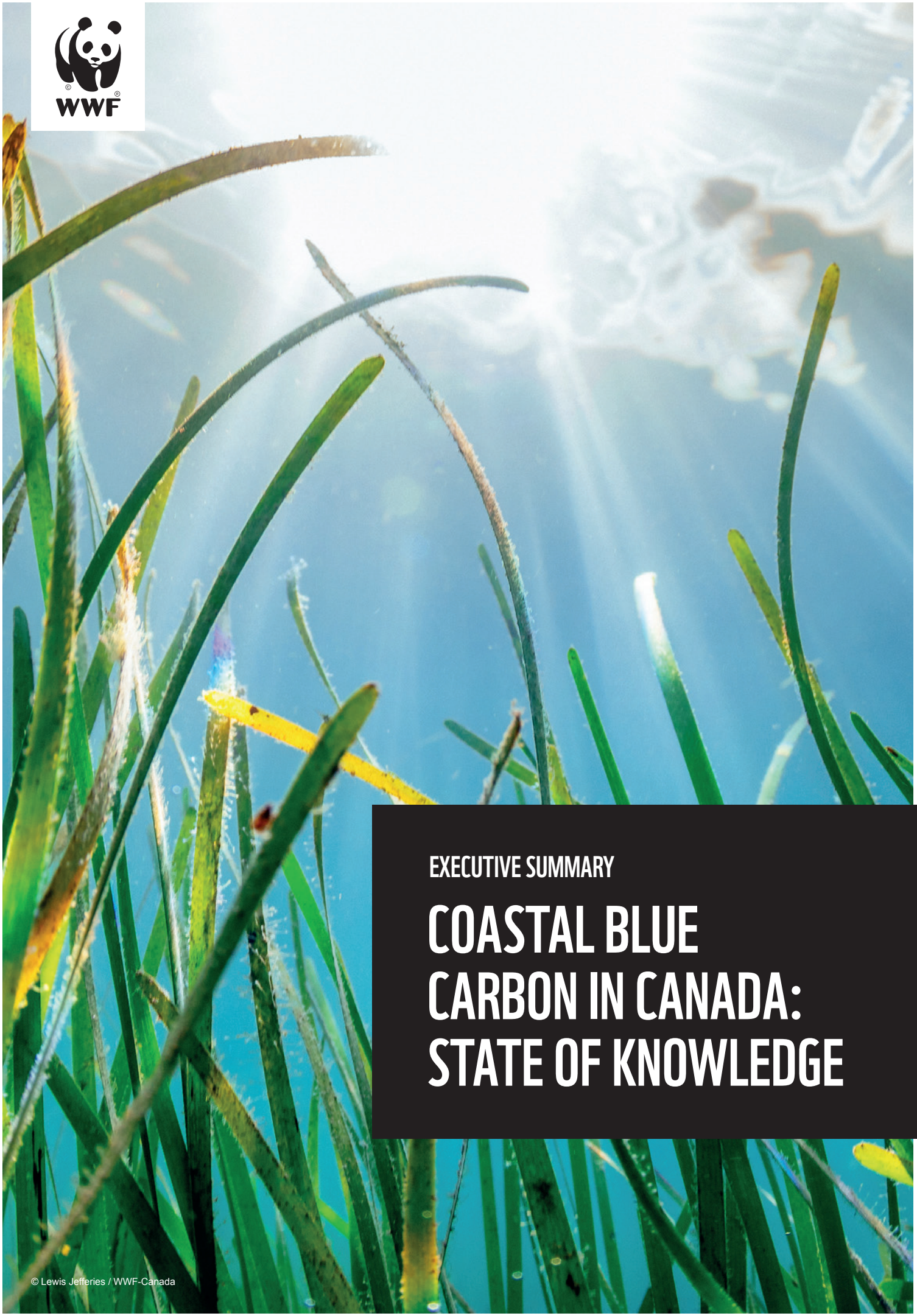

EXECUTIVE SUMMARY

COASTAL BLUE CARBON IN CANADA: STATE OF KNOWLEDGE

IN THE MIDST OF DUAL BIODIVERSITY AND CLIMATE CRISES, WE URGENTLY NEED SOLUTIONS THAT PROVIDE BENEFITS FOR PEOPLE, NATURE AND THE CLIMATE.

James Snider
Vice President, Science, Knowledge and Innovation
World Wildlife Fund Canada

A female grizzly bear (Ursus arctos horribilis) with her cubs in the Khutze Estuary, Great Bear Rainforest, British Columbia, Canada

Disclaimer: The opinions expressed in this report are those of the authors and do not necessarily reflect the views or positions of WWF-Canada.

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OVERVIEW

Canada's expansive coastline supports diverse ecosystems, including salt marshes, eelgrass beds and kelp forests, which provide habitat for wildlife and have supported and protected coastal communities for millennia. Recently, there has been growing interest in the ability of these "blue carbon" ecosystems to help in the fight against climate change because of their ability to sequester and store carbon. With this recent surge in interest, an exploration of the current state of knowledge of blue carbon in Canada is timely, as many unknowns remain.

WWF-Canada brought together knowledge holders from across the country to share their expertise on the current state of blue carbon in Canada through political, legal, cultural and socio-economic lenses. Specifically, the report:

- presents multiple perspectives on blue carbon and identifies critical knowledge gaps;
- acts as a resource for people interested in, or currently working on, coastal blue carbon ecosystems; and
- provides information to policy- and decision-makers to support sustainable management.

While the report is not exhaustive and does not include all voices or perspectives, it aims to inspire and facilitate the collaborative research and action needed to advance blue carbon-related work across the country.

WHAT IS COASTAL BLUE CARBON?

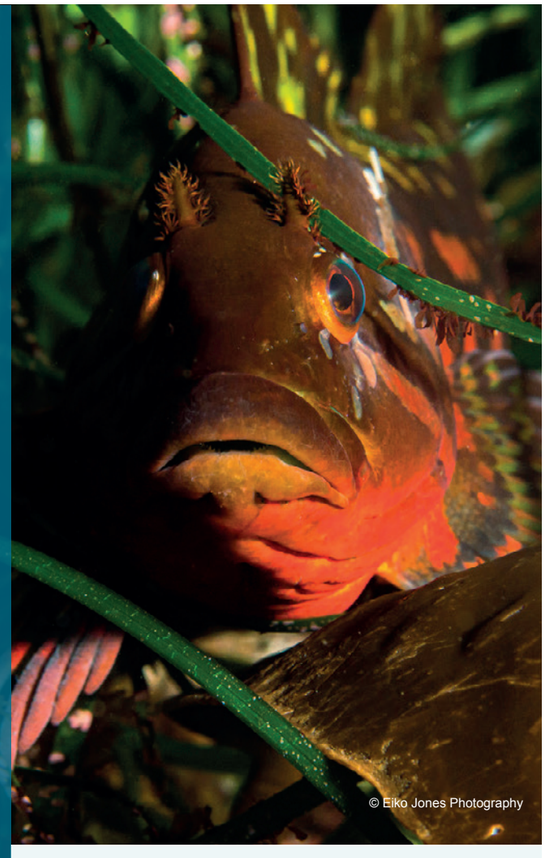
Coastal blue carbon refers to carbon that is removed from the atmosphere and stored in the plants and sediments of saltwater ecosystems across Canada's 244,000-kilometre coastline. Salt marshes and seagrass beds sequester carbon dioxide over thousands of years, building stocks of carbon in rich marine sediments. Farther offshore, kelp forests convert carbon dioxide into carbon-rich biomass, which may be buried in nearby sediments or exported to the deep ocean.

Blue carbon habitats can aid with climate change mitigation efforts, but they also have numerous co-benefits: they support wildlife (including culturally and economically important species), improve water quality, protect coastal lands from flooding and erosion, support cultural practices, and generate revenue for coastal communities.

There is considerable variability among blue carbon ecosystems in terms of their health, distribution and potential for carbon storage. The threats, opportunities and legislative and jurisdictional contexts also vary from coast to coast to coast. To accurately quantify carbon dynamics and facilitate the inclusion of blue carbon stocks into Canada's Nationally Determined Contributions, we need to support additional and ongoing mapping efforts, in addition to enhancing our understanding of carbon fluxes and flows across ecosystems. Baseline information is also critical for supporting the sustainable management, protection and restoration of these valuable ecosystems.

THE STATE OF BLUE CARBON

Despite the long-standing connections between people and coastal lands, there is still much to learn about blue carbon ecosystems, because they do not exist in isolation; coastal ecosystems are complex and dynamic. Indigenous Peoples have successfully stewarded healthy and resilient ecosystems for millennia and their deep knowledge offers ways of understanding the connections between land and sea. Coastal lands are also strongly influenced by both land- and ocean-based activities. Multiple stressors, such as coastal development, pollution, aquaculture, invasive species, fishing and boating activities, and climate change affect coastal ecosystems to varying degrees. As a result, some coastal habitats have seen severe declines.



Rock greenling (*Hexagrammos lagocephalus*) resting in eelgrass

NATURE-BASED CLIMATE SOLUTIONS AND INDIGENOUS-LED CONSERVATION

The protection, stewardship and restoration of blue carbon ecosystems are known as nature-based climate solutions (NbCS). These conservation actions may also provide benefits for biodiversity, climate and human well-being. Since blue carbon exists in the territories of coastal Indigenous Peoples (First Nations, Inuit and Métis) throughout Canada, initiatives and policies can be enhanced by Indigenous worldviews that emphasize reciprocity and relationships between people and ecosystems. With long-standing knowledge and expertise, Indigenous Peoples are well positioned to lead efforts to steward, restore and protect blue carbon ecosystems. At a minimum, effective implementation of NbCS must include collaboration and consultation with Indigenous Peoples from the outset to advance local priorities, objectives and values.

THE LEGAL AND POLITICAL CONTEXT

Indigenous-led conservation offers insights into how to care for coastal ecosystems in ways that honour the interconnected nature of the land and sea. In contrast, the division of coastal jurisdiction between federal, provincial, territorial and municipal governments creates a false separation of coastal environments that is at odds with advancing blue carbon work. Coastal First Nations govern according to their rights, traditional laws, ethics, values and teachings, but the land-sea interface is also a mosaic of Crown regulations and laws. A more holistic approach to coastal management is needed to ensure that all stressors, both in the ocean and on land, are effectively managed. Environmental co-governance that draws on Indigenous worldviews and the concept of "two-eyed seeing" is an important path forward in this regard.

Fortunately, the political and legal landscape around conservation in Canada is shifting away from the establishment of parks and protected areas in Indigenous territories without the consent and partnership of Indigenous Peoples. Indigenous Protected and Conserved Areas (IPCAs), which centre Indigenous self-determination in conservation approaches, are at various stages of establishment in Canada and can help meet domestic and international conservation targets.

Aerial view of inter-tidal saltmarsh

FINANCING THE PROTECTION, STEWARDSHIP AND RESTORATION OF BLUE CARBON ECOSYSTEMS

Currently, there are large gaps between the funding needed to protect and restore blue carbon ecosystems and the funding available. However, emerging innovative conservation financing tools could bridge this gap. They include blue bonds, impact investing, trust funds and nature-based insurance solutions, along with carbon markets and the economic opportunities of kelp cultivation. While many research and policy initiatives globally are exploring financing for blue carbon, there are challenges with existing frameworks and protocols and changes are needed to guide project implementation and the equitable distribution of benefits.

Cultivating seaweed for commercial or subsistence purposes is also of considerable interest. Most cultivated seaweed is used for food, but it can also be used for fertilizers, biofuels, biomaterials and pharmaceuticals. While seaweed cultivation in Canada is mostly small scale, there are opportunities for expansion, with multiple benefits to coastal communities. A fuller understanding of the carbon pathways involved in seaweed cultivation is needed to understand the blue carbon potential of this approach.

Regardless of the type of financing used, the design and implementation of projects need to be equitable and respect Indigenous rights.

MOVING FORWARD: A SEA OF OPPORTUNITIES

Blue carbon and its associated NbCS present a sea of opportunities that must be engaged with thoughtfully and respectfully. Throughout the report, authors have highlighted pathways for moving forward.

> *While we work to improve our understanding of carbon dynamics in coastal ecosystems, we should be collaboratively designing solutions with Indigenous Peoples and coastal communities to safeguard the valuable services that these ecosystems provide.*

There is considerable variability among blue carbon ecosystems in Canada in terms of their health, distribution and potential for carbon storage. The threats, opportunities, and legislative and jurisdictional contexts also vary from coast to coast to coast. This variability highlights the urgent need for enhanced data collection using standardized methods, which must be conducted with respect for the knowledge holders and include the right to free, prior and informed consent.

While we work to improve our understanding of carbon dynamics in coastal ecosystems, we should be collaboratively designing solutions with Indigenous Peoples and coastal communities to safeguard the valuable services that these ecosystems provide. Equitable approaches to blue carbon management that elevate and guarantee Indigenous governance, rights and responsibilities are imperative. It is vital to recognize the extensive collective knowledge of Indigenous Peoples, who have successfully stewarded healthy coastal ecosystems for millennia.

Additional and targeted investment in blue carbon is needed but we can also leverage existing financial tools. Investment will accelerate the implementation of NbCS and ensure that proper monitoring can take place to inform national and international carbon targets and relevant policy and legislation.

Changes to policy and legislation will be necessary to effectively protect, steward and restore blue carbon ecosystems. Likewise, given the jurisdictional challenges associated with coastal ecosystems, collaboration and integration among jurisdictions and Indigenous Nations will be necessary to facilitate a more holistic approach.

Please see the full report for a comprehensive list of recommendations.

BUILDING A COMMUNITY OF PRACTICE

Partnerships and collaboration between knowledge holders, practitioners and decision-makers are critical to developing a more holistic approach to fighting climate change, reducing biodiversity loss and improving the well-being of coastal communities. The blue carbon community of practice, which is brought together by WWF-Canada, aims to to provide a forum for these collaborative relationships and facilitate respectful knowledge exchange to ensure that blue carbon work is effectively advanced across Canada. Our hope is that this report will further spur the connections, collaborations and research that will enable Canada to act as a global leader in the protection, stewardship and restoration of coastal blue carbon ecosystems.

Dunlin (*Calidris alpina*)

A Canada with abundant wildlife, where nature and people thrive.

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