Canada's submission to the seventeenth round of Informal Consultations of State Parties to the United Nations Fish Stock Agreement (ICSP-17)

Sustainable fisheries management in the face of climate change

Climate change and biodiversity loss are altering Canada's oceans and freshwater resources, posing a serious risk to aquatic ecosystems with significant social, cultural, and economic implications for fisheries, marine resource industries, as well as coastal and Indigenous communities.

Canada's climate is warming at twice the rate of the global average, 1 ( )10fl BDC 23.34 0 .1 (sa)-4 (ar)10 (min)-

Canada's fish stocks and fisheries have historically fluctuated from year to year, however the current changes fall outside this variability and are occurring at an unprecedented rate. Canada expects these impacts to accelerate and intensify moving forward. The potential losses and gains for harvesters and coastal communities are expected to be variable across all regions, however, climate related declines in animal biomass will likely be the most significant in areas that currently support the largest Canadian fishery landings. Further, many traditional stock assessment estimates are based on an assumption that populations are in a state of environmental 'equilibrium', which will be increasingly hard to rationalize under many climate change scenarios and will require increasingly more complex analytical solutions to address adequately. In some cases, socio-economic impacts of climate change are expected to intensify. While these impacts are being felt differently across Canada's three coasts, Canadians are already experiencing disruptions to their livelihoods, and loss of revenue caused by extreme weather and fishery closures.

The implications of climate change have, and will, continue to challenge the ability of our current fisheries management regime to adapt quickly and nimbly to the instability and uncertainty of these changes. The ability of both the harvesting sector and governments to adapt to the challenges brought on by climate change will play a considerable role in the of future of sustainable fisheries in Canada.

2. Legislative and regulatory tools to sustainably manage Canadian fisheries in the face of climate change

Canada's Fisheries Act (the Act) provides a framework for the proper management and control of fisheries and the conservation and protection of fish and fish habitat. Under the authority of the Act, the Minister of Fisheries and Oceans can adjust harvest levels of fish stocks to account for the uncertainty associated with the effects of climate change on those stocks. Recommendations to the Minister on harvest levels are guided by the precautionary approach, which is outlined in Canadian policy. Thus, if there is uncertainty about the status of a fish stock, or the environment's effects on the stock, the Minister may implement a more risk-averse harvest level.

In 2019, the Act was amended to strengthen Canada's fisheries management framework, including the introduction of the Fish Stocks provisions. These provisions require the Minister to implement management measures to maintain major stocks prescribed in regulation at levels necessary to promote their sustainability, and to develop and implement rebuilding plans if they become

The Act and associated regulations give the Minister the authority to monitor fishing activity and request reports on catches. For example, licence holders can be required to: (a) keep log books on their catches and have their log book data verified by a third party, or (b) have a certain percentage of their trips accompanied by an at sea observer, or (c) ensure that all landings are offloaded in the presence of a dockside monitor.

Monitoring requirements differ from one fishery to the next. The specific monitoring requirements for a fishery are set out in the Conditions of Licence for each fishery and enforced via delivery of enforcement programs. Canada's department of Fisheries and Oceans is in the

Canada's rich endowment of marine and fisheries resources is important for sustaining our economy, holding the keys to economic growth, employment, and innovation. Marine Protected Areas (MPA) and other effective area-based conservation measures (OECMs) contribute to a healthy marine environment and may mitigate the impacts of climate change and biodiversity loss by protecting important species, their habitats, and support the recovery of depleted fishing stocks. In 2021, Canada invested $976.8 million in funding over five years to manage existing sites and to conserve 30 per cent of our oceans by 2030, through MPAs and OECMs, such as marine refuges. Canada's marine conservation processes are informed by science, Indigenous knowledge, and local perspectives through all phases of site establishment and ongoing management. In partnership with provinces, territories, Indigenous peoples, marine industry stakeholders, ENGOs, academia, and local communities – we have moved from approximately one per cent of protected ocean space in 2015 to today's current total of 14.66 per cent.

Biodiversity is a fundamental pillar to healthy oceans and resilient ecosystems, and resilient ecosystems help support abundant fish stocks. Thus, actions towards mitigating biodiversity loss and restoring ecosystems are actions towards sustainably managing fisheries in the face of climate change. While climate change is recognized as one of the leading threats to biodiversity, ecosystems have complex responses to climate change which are incompletely understood and context specific. There is, however, a growing body of evidence to suggest that the conservation and sustainable use of marine biodiversity, domestically as well as in areas beyond national jurisdiction, may enhance the resilience of marine ecosystems, help ecosystems recover from disturbances, and enable more effective adaptation to changes over time.

Domestically, Canada has made strides in conserving its oceans. By working with provinces, territories, Indigenous Peoples, marine industry stakeholders, ENGOs, academia and local communities, Canada has protected and conserved more than 14 per cent of its marine and coastal areas to date. Canada is committed to conserving 30 per cent of Canada's oceans by 2030 through the establishment and effective management of marine protected areas (MPAs) and recognition of other effective area-based conservation measures (OECMs).

Canada is also investing in climate resiliency for small craft harbour infrastructure to drive economic growth by supporting the capacity of Canada's commercial fisheries, as well as other marine users such as fish processing, transportation, aquaculture, and tourism. Since 2016, the Government of Canada has announced more than $1.3 billion in new funding to support small craft harbours, where 90 per cent of catches by Canadian commercial harvesters are landed.

Fisheries and Ocean Canada works to ensure that modifications to small craft harbour assets, such as wharves and breakwaters, appropriately take into consideration the impacts of climate change and are designed and built using the best climate-resilience information available. This work leverages tools such as the Canadian Extreme Water Level Adaptation Tool and the

Coastal Infrastructure Vulnerability Index. The impact of climate change and significant weather events was clearly demonstrated during Hurricane Fiona in 2022, when 142 small craft harbours in Atlantic Canada and Eastern Quebec were damaged, of which 83 required significant interventions to ensure they were safe and operational.

In light of this destruction, the Hurricane Fiona Recovery Fund (HFRF) was announced on

with fish harvesters to identify how whale-safe technology and practices can be incorporated safely and effectively into their operations. For example, in 2023, Canada amended the Fishery (General) Regulations of the Fisheries Act to provide new flexibility to change the way harvesters mark their fishing gear on the water surface, creating new opportunities to support harvesters' use of innovative fishing gear in commercial fisheries. Harvesters will play a central role in developing a Whale-safe Gear Strategy for Canada, to guide our long-term efforts to protect whales while supporting sustainable and prosperous fisheries.

3.2 The use of Marine Protected Areas to protect important subsistence species

The Anguniaqvia niqiqyuam marine protected area (ANMPA) in the Western Arctic was the first marine protected area in Canada to have a conservation objective solely based on traditional knowledge. This conservation objective serves to protect important subsistence species: qilalugaq (beluga), iqalukpik (Char), and natchiq and ugyuk (ringed and bearded seals), as well as their key habitat. The first monitoring plan for the ANMPA is being developed so that community priorities are the backbone of the plan. Collaboration with partners will lead to monitoring of the important ecological features of the MPA as well as the priorities and concerns of communities in the Inuvialuit Settlement Region.

3.3 Use of management strategy evaluation (MSE) to develop management strategies

Where data and resources permit, Canada is increasingly using management strategy evaluation (MSE) as a tool to develop harvest strategies and rebuilding plans. Unlike stock assessments that rely on a single model to assess stock status and/or provide projections of future stock states, MSE tests whether potential harvest strategies can achieve pre-agreed management objectives across a range of plausible modelled scenarios. This enables Canada to identify management strategies that are likely to perform well, despite uncertainty in how environmental conditions may change or how the stock may react to those changes, as well as balance trade-offs among competing management objectives. For example, MSE was recently used to develop a rebuilding plan required under the Fish Stocks provisions of the Fisheries Act Pacific herring – Haida Gwaii. This harvest strategy and rebuilding plan is intended to be reviewed periodically, to ensure they are accomplishing the pre-agreed management objectives, and if not, to allow for adjustments as more information is gathered.

3.4 Adaptive inseason management of anadromous fish stocks

For some fish stocks, such as Pacific sockeye salmon, Canada has longstanding management practices to respond to in-season changes in environmental conditions. In British Columbia, Fisheries and Oceans Canada monitors water levels and temperatures of the Fraser River in advance of sockeye stocks returns to spawn. Management of these stocks is based on escapement targets – that is, the number of adult fish that are not captured in the ocean salmon fisheries and thus are able to return to spawn in the Fraser River system. In years when the water conditions are less favourable and are likely to result in higher mortality as the adults

migrate upstream to their spawning grounds, the permitted harvest level is reduced in the oceanic fishery to ensure greater numbers of these salmon to return to the Fraser in order to offset the expected natural mortality.

3.5 Adaptive management of Newfoundland snow crab in a changing world

From the perspective of EAFM, Newfoundland snow crab demonstrates how environmental variables can help to provide improved understanding of stock performance and contribute to an improved capacity to make predictions about that performance. Incorporating several environmental variables into the stock assessment, including water temperature as a primary environmental variable, the North Atlantic Oscillation index (fluctuations in atmospheric pressure at sea level), biological structure and trends, and available knowledge of ecological interactions (e.g., predator-prey) and stressors (e.g., anthropogenic impacts), demonstrate how
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place gradually over time while others may be more rapid and difficult to predict, such as sudden marine heat waves or cold spells, all of which can affect stocks differently. The magnitude and specific impacts of such changes vary across aquatic ecosystems; nonetheless, point to the need for action to manage fisheries in ways that anticipate and are responsive to these changes.

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