

Sustaining healthy fisheries, waters and economies



Submission to the Senate Standing Committee on Fisheries and Oceans (POFO) on *Bill C:68: an Act to amend the Fisheries Act and other Acts in consequence*



INTRODUCTION

Marine fish populations in Canada have declined by more than 50% since 1970, with 26 stocks listed in the critical zone as determined under the Sustainable Fisheries Framework guidance on the precautionary approach.¹ Many recreational freshwater and marine fish species are either in decline or maintained primarily by stocking. Of the 711 species assessed at some level of risk by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), 158 are fishes.² The *Fisheries Act* is critical to protecting and restoring our remarkable oceans, rivers, and lakes and safeguarding fish and fish habitat as essential elements of Canada's irreplaceable natural capital.

We would like to thank the Senate Standing Committee on Fisheries and Oceans (POFO) for the opportunity to share our views on Bill C68 - An Act to amend the *Fisheries Act* and other Acts in consequence. This submission reflects the views of a group of conservation and environmental organizations that has been working together on *Fisheries Act* reform for over three years.³ It focuses on three aspects of Bill C-68 that are fundamental to protecting, restoring and sustaining fish populations and fish habitat for generations to come:

1. Environmental flows for fish and fish habitat;
2. Rebuilding and sustaining fish populations; and,
3. Habitat offsetting to help address cumulative effects.

SUPPORT FOR PASSAGE OF BILL C-68

Bill C-68 is the result of three years of consultation by the House of Commons Standing Committee on Fisheries and Oceans (FOPO), the Minister of Fisheries, Oceans and the Canadian Coast Guard, and Fisheries and Oceans Canada (DFO). Environmental and conservation organizations have actively participated in consultations on *Fisheries Act* reform, including the FOPO study on the previous government's changes to the Act, the online forum (LetsTalkFishHabitat.ca), a roundtable with the Minister, and most recently the legislative process for Bill C-68.

Bill C-68 goes a long way toward delivering on the mandate issued by the Prime Minister to the Minister of Fisheries, Oceans and the Canadian Coast Guard to "restore lost protections and introduce modern safeguards" to the *Fisheries Act*. It takes a balanced approach that focuses on conserving and enhancing biodiversity, supporting communities and economies that depend on healthy fisheries, and managing impacts of development in ways that protect and restore fish populations and fish habitat. Highlights of Bill C-68 from the perspective of the environmental and conservation community are included below.

RECOMMENDATION

We encourage swift passage of Bill C-68 through the Senate to ensure a robust implementation framework for the *Fisheries Act* is in place upon coming into force.

HIGHLIGHTS OF BILL C-68

Clear purpose and decision-making criteria. Bill C-68 adds a specific clause to the *Fisheries Act* establishing an overarching purpose for the law. It further introduces a set of factors and considerations to guide decision-making, including cumulative effects, Indigenous knowledge, science, and the long-term sustainability of fisheries.

Modernized protections for fish habitat. Bill C-68 returns the previous prohibitions on the harmful alteration, disruption or destruction of fish habitat (HADD) and killing fish by any means other than fishing. It also updates the definition of fish habitat to reflect modern science on the characteristics of water flow that fish need to survive and thrive.

New provisions for rebuilding fish stocks. Bill C-68 includes new provisions that require the Minister to manage fish populations sustainably and to establish plans to rebuild depleted stocks. These new requirements set an expectation that fish populations will be managed to healthy levels, or will be returned to a healthy state if they are depleted.

Innovations in data management. Bill C-68 will establish a public registry to facilitate access to data related to implementation of the *Fisheries Act*. This new resource has the potential to enhance transparency of decision-making and make critical information for protecting and restoring fish populations and fish habitat available to a wide range of interests.

Five-year review. Bill C-68 includes a requirement that Parliament review the provisions and operation of the *Fisheries Act* every five years, building in a mechanism for adapting the law over time to reflect changes in environmental, social and economic context. The Bill also includes transitional provisions to ensure a smooth shift to new or revised regulations and policies under an updated Act.

Stronger focus on Indigenous rights. Bill C-68 provides increased opportunities for Indigenous participation in decision-making and management, new requirements to consider Indigenous knowledge, and enhanced consultation requirements.

Independence of Atlantic Canada's inshore fisheries. Bill C-68 will enshrine the independence of inshore Atlantic Canada's fisheries in law. Together with the provisions for rebuilding fish stocks, and a commitment to ensure both are properly implemented, this provides greater certainty for Canada's coastal and rural economies.

1. ENVIRONMENTAL FLOWS FOR FISH AND FISH HABITAT

Scientists consider the characteristics of water flow to be a “master variable” for conserving, protecting and restoring aquatic ecosystems, habitat and species.⁴ Water flows needed to achieve a desired ecosystem or habitat condition are referred to as environmental flows. The Brisbane Declaration, endorsed in 2007 by more than 800 experts from around the world and updated in 2018, defines environmental flows as:

“...the quantity, timing, and quality of freshwater flows and levels necessary to sustain aquatic ecosystems which, in turn, support human cultures, economies, sustainable livelihoods, and well-being.”⁵

There are limits to the degree to which the water flows can be altered before aquatic ecosystems, habitats and species become compromised. Flows can be altered by withdrawals of water from water bodies, instream structures such as dams and weirs, improperly sized culverts, pollution, and by impacts of climate change. Often, the cumulative effects of a number of factors undermine the health of aquatic ecosystems. Management of environmental flows balances the water needed to support fish communities, habitats and aquatic ecosystems with the water demands of agriculture, communities and industry.

In 2013, DFO solicited expert advice through the Canadian Science Advisory Secretariat (CSAS) on “the management of the flow regimes and water levels required to maintain the ecological functions that sustain fisheries associated with that water body and its habitat.” The CSAS report pointed to the lack of a national environmental flow standard as a deficiency in Canada’s fish habitat framework, noting:

“The fact that there is no existing national framework to set environmental flow standards has led to a situation where fisheries resources, fish habitat and the supporting freshwater ecosystems may not be consistently protected across Canada. With increasing water demand, and potentially changing background levels in water availability (as predicted by the Intergovernmental Panel on Climate Change and current scientific consensus on the long-term effects of global climate change), there is an urgent need to establish such an environmental flows framework in Canada.”⁶

The report also outlined a framework for assessing and addressing environmental flow requirements for fish and fish habitat in Canada.⁷

Environmental flows and Bill C-68

Bill C-68 will incorporate three provisions into the *Fisheries Act* that provide a basis for creating the national environmental flow framework for fish and fish habitat recommended in the CSAS report:

- Section 2(2) integrates the concept into the definition of fish habitat with a clause that reads: *For the purposes of this Act, the quantity, timing and quality of the water flows that are necessary to sustain the freshwater or estuarine ecosystems of a fish habitat are deemed to be a fish habitat.*
- Section 34.3(2) enables the Minister to issue orders to provide for the free passage of fish or the protection of fish and fish habitat. These orders are a discretionary tool that the Minister may use if he or she “considers that doing so is necessary.” Orders establish specifications for “the management or control of an obstruction or any other thing that is detrimental to fish and fish habitat” in order to, among other things:

- (f) maintain the flow of water necessary to permit the free passage of fish;
 - (g) maintain at all times the characteristics of the water and water flow upstream and downstream of the obstruction or thing that are necessary for the conservation and protection of fish and fish habitat, including
 - (i) the water temperature, and
 - (ii) the physical characteristics and chemical composition of the water flow.
- Section 34.3(7) states:
The Minister may make regulations respecting the flow of water that is to be maintained to ensure the free passage of fish or the protection of fish and fish habitat.

Concerns and criticisms

Members of the regulated community have expressed concern over the environmental flows provisions in Bill C-68. We understand these concerns and recognize that they are matters of implementation rather than problems with the legislation.

IT'S NOT ABOUT DESIGNATING PUDDLES AS FISH HABITAT

Subclause 1(10) of Bill C-68 deems the characteristics of water flow necessary to sustain freshwater or estuarine ecosystems to be part of fish habitat. The regulated community has speculated that this could lead to industrial or municipal water flows, rainwater running off of city streets or farm fields, or even puddles, being designated as fish habitat under the Act.⁸ This is not what the scientific understanding of environmental flows entails, and it is not how the scientific experts convened by DFO to provide advice on Canada's fish habitat framework interpreted the concept.

Protecting and regulating impacts on fish habitat has historically focused on areas of sand, rock, gravel or aquatic vegetation used by fish for spawning and feeding grounds. The addition of water flows to the definition of fish habitat recognizes that fish cannot use spawning habitat or feeding grounds unless they are covered with the right amount of clean water at the right time of year. This important modernization to the Act better reflects how scientists (and fish) understand what constitutes fish habitat.

DFO already considers the characteristics of water flow when making decisions about fish habitat protection under the Act. Bill C-68 will thus improve and modernize the law, making existing policies more transparent and consistent by codifying the scientific information and Indigenous knowledge used to assess flow needs for fish and fish habitat, the thresholds for unacceptable levels of flow alteration, and the direction provided to proponents to mitigate or offset harm due to impacts on water flows.

POLICY OVERLAP IS NORMAL, MANAGEABLE AND USEFUL IN A COOPERATIVE FEDERATION

In Canada, fish and fish habitat fall under federal jurisdiction, while managing the water that sustains them is primarily the responsibility of provinces (and to an increasing degree, territories and

Indigenous Nations). As such, overlap between the environmental flow provisions in Bill C-68 and provincial and territorial laws that regulate water withdrawals and instream uses of water flow such as hydropower generation is to be expected.

This overlap illustrates the principle of cooperative federalism, which the Supreme Court of Canada recently ruled “allows for interplay and overlap between federal and provincial legislation.” The Court cautioned against an overly broad interpretation of federal powers when interpreting this principle: “While cooperative federalism does not impose limits on the otherwise valid exercise of legislative power, it does mean that courts should avoid an expansive interpretation of the purpose of federal legislation which will bring it into conflict with provincial legislation.”⁹

Other Supreme Court cases similarly describe this principle. “Cooperative federalism” (a) presumes that laws of different orders of government are intended to co-exist; (b) often applies to “facilitate interlocking federal and provincial legislative schemes and to avoid unnecessary constraints on provincial legislative action”; and (c) “accommodates overlapping jurisdiction and encourages intergovernmental cooperation.”¹⁰

Policy overlap is thus normal, manageable and even useful. For example, British Columbia’s Water Use Planning program was developed to balance water supply need, flows for hydropower generation and other human uses with the flows required to sustain fish and fish habitat, effectively satisfying provisions in both the *Fisheries Act* and provincial water law.¹¹ Similar policies for balancing human water uses with environmental flow needs exist in other provinces (e.g., Ontario, Alberta). Bill C-68 provides for the harmonizing of the *Fisheries Act* with these policies on a national scale.

Focusing on implementation

The environmental flows provisions in Bill C-68 bring what is already happening in policy and practice – at least in some cases and some places – formally into the law. These modernizations to the *Fisheries Act* will ensure that consideration and management of environmental flows for fish and fish habitat are applied consistently and transparently across the country. These improvements to the Act are warranted given the troubling trends in the state of fish populations in Canada.

Bill C-68 introduces a broader suite of regulatory mechanisms to support implementation of the Act. Codes of practice, in particular, are intended to minimize dependence on individual authorizations by providing guidance on avoiding impact to fish habitat associated with routine works, undertakings and activities. If properly designed, this and other implementation mechanisms (i.e., regulations, standards, policy) can ensure environmental flows are addressed effectively and efficiently across the country under a modern *Fisheries Act*.

RECOMMENDATIONS

We recommend that the Committee request an explanation from the Minister and DFO to clarify the intent of the environmental flow provisions in Bill C-68.

We recommend maintaining the environmental flow provisions in Bill C-68 in their current form in order to provide the legal foundation for developing a national environmental flows framework as recommended by CSAS experts.

2. REBUILDING AND SUSTAINING FISH POPULATIONS

The need to rebuild our fisheries has never been greater. Fisheries remain depleted decades after collapse and we are in the vulnerable position of being dependent on only a handful of species to support the fishing industry. Canada has gone from being the seventh largest producer of wild fish by weight in the 1950s to twenty-first place today. Additionally, there are currently 26 stocks in the critical zone but only five rebuilding plans (two of which were released recently). Furthermore, it is over 25 years since the collapse of the Northern Cod stocks, and no rebuilding plan is in place, it is clear that a legislative requirement to do so is needed.

Bill C-68 introduces new provisions to the *Fisheries Act* that establish a legal direction for rebuilding of fish populations through a requirement to create rebuilding plans for stocks that have fallen into the critical zone. This modernization will bring Canada in line with other developed fishing nations and provide much needed clarity on the responsibility of DFO to take measures to restore depleted stocks.

The majority of developed fishing nations (e.g., Australia, EU, New Zealand, US) have requirements to rebuild fish populations as part of fisheries management. Additionally, Canada is a Party to the United Nations Fish Stocks Agreement (UNFSA) and the FAO Code of Conduct for Responsible Fisheries, both of which require measures to maintain healthy fish stocks.^{12,13}

However, Canada's record on implementing its own policies under the Sustainable Fisheries Framework – which articulates guidelines on fisheries rebuilding according to the precautionary approach – is poor. Canada's Auditor General assessed progress on fisheries rebuilding and monitoring in its 2016 report “Sustaining Canada's Fisheries” and as a result, DFO committed to developing rebuilding plans for 19 depleted populations over a five-year time period.

Peer reviewed publications on fisheries rebuilding provide clear recommendations on the need to reduce fishing mortality immediately upon signals of stock decline, as well as consideration of life history characteristics and natural mortality.^{14,15,16} While Canadian fisheries management is arguably sophisticated as compared to many other countries, it seems that past experience has not resulted in a fundamental change in how decisions are made, or in a commitment to departing from the status quo.

Improvements in Bill C-68

The new Section 6 in Bill C-68 is a significant step in the right direction on rebuilding fish populations. Since the 2016 Auditor General report on “Sustaining Canada's Fisheries”, there has been considerable improvement in the transparency of decision-making by DFO and some progress in completing rebuilding plans as per DFO's workplan in response to the report. Despite these improvements, we are concerned that the commitment to rebuild populations to above the critical zone and not expressly to the healthy zone will mean that fisheries may resume too quickly after signs of recovery. This has been the case with multiple cod stocks in Atlantic Canada, all of which remain at historically low levels. We recognize that socio-economics is a significant factor in decisions taken to close a fishery or reduce directed catch. However, socio-economic considerations are rarely applied with the long-term view of the stock in mind.

Bill C-68 also requires the creation of regulations to identify major fish stocks, to which the rebuilding provisions will apply. We recommend removing the term “major” as this is not defined in the *Fisheries Act* and also has the potential to further result in shifting baselines for a variety of

depleted populations.

Need for strong regulations and rebuilding plans

To ensure that the new rebuilding provisions are effective, DFO must create strong regulations that include timelines for rebuilding plans to be completed and clear targets for achieving long-term population recovery. Rebuilding plans must also begin to incorporate an ecosystem approach, and considerations should be made for multi-species rebuilding plans where appropriate. Finally, it is imperative that DFO work towards more interaction and cohesion between its Species at Risk programming and fisheries management, particularly for those species not listed under the Species At Risk Act but assessed by COSEWIC. For example, DFO has identified bycatch and overfishing as key threats to fisheries – and at the same time manages these activities through fisheries management fora. The new rebuilding provisions will not be effective unless there is clear direction from DFO to all regions that both bycatch and overfishing be addressed and avoided where these activities will result in further decline of marine fish.

Canada has the world’s largest coastline, three ocean basins, and a poor history of rebuilding depleted stocks. Passage of Bill C-68 and establishing strong regulations for rebuilding provides an opportunity to create a future for fisheries in Canada that heeds lessons from the past to ensure healthy fish populations and sustainable fishing economies for generations to come.

RECOMMENDATIONS

We recommend that the committee request an explanation from the Minister and DFO on the intent of the rebuilding provisions in Bill C-68.

We recommend that the committee review amendments that will make the rebuilding provisions stronger so that they will:

- Ensure the purpose of the rebuilding provisions are clearly to rebuild fisheries, whenever possible, to a healthy state;
- Limit the exceptions so that they don’t become the rule;
- Ensure that the long-term benefits of rebuilding are also considered when looking at “adverse economic impacts”;
- Remove the term “major” in section 6.3 so that it applies more broadly to stocks as there isn’t currently an accepted definition of “major”.

Finally, we encourage DFO to continue efforts to maintain transparency in data and reporting on the progress of fisheries rebuilding.

3. HABITAT OFFSETTING TO HELP ADDRESS CUMULATIVE EFFECTS

Under the *Fisheries Act*, DFO issues authorizations for projects that harm fish habitat and requires proponents to create offsets – habitat restoration or creation projects that compensate for habitat loss. Evidence indicates that such compensation has been inadequate because many offsets are improperly built, maintained or monitored, or are not as effective as anticipated.¹⁷

Beyond its ineffectiveness, proponent-led offsetting imposes a significant administrative burden on both proponents and DFO. Each project must undergo a detailed review and receive an authorization before it may proceed. This has led DFO to adopt a triage system that allows some projects to proceed without an authorization despite causing a significant loss of fish habitat. The cumulative effects of habitat loss and degradation from ineffective offsets, coupled with a lack of compensation for harm caused by some projects that are triaged out of the authorization process, is of great concern and is resulting in a cumulative net loss of fish habitat across Canada.

Enhancing new tools for offsetting in Bill C-68

Bill C-68 introduces two new tools that, if enhanced by minor amendments, could be used to introduce alternative approaches to offsetting, achieve better fish habitat outcomes, and improve the authorization process. Specifically:

1. The new Sections 11 to 16 proposed in Bill C-68 introduce a variety of ways in which DFO could collect fees for providing services or rights. A minor amendment to the proposed Section 11 could enable DFO to collect payment in lieu of offsets for certain classes of projects and designate these funds to support future strategic restoration works in a defined service area.
2. The new Sections 42.01 to 42.04 introduce proponent-led habitat banking into the *Fisheries Act* as a means to offset harm to fish habitat. The provisions in Bill C-68 would allow a proponent to create a habitat bank by completing a restoration project in advance of development projects, then use credits from this bank to offset harm from future projects the proponent undertakes. Unfortunately, restricting banking to a model where only the project proponent can create and manage the habitat bank puts this effective form of offsetting harm out of the reach of most proponents such as small municipalities, large agricultural operations, and medium sized industries. Amending Bill C-68 to enable third party habitat banking would allow independent organizations to create habitat banks and sell credits to proponents, or proponents to sell credits from their banks to other parties. If enabled by Bill C-68, DFO and stakeholders could then proceed to develop a third party habitat banking regime that, over time, would become accessible to more proponents and capable of achieving better fish habitat outcomes. This can be achieved through a series of minor amendments to the language of Sections 42.01 to 42.04.

Finally, an addition to Section 35 would ensure these different types of offsetting are enabled and that an equivalent or greater physical offset, payment in-lieu of offset, or habitat bank credit is provided for the harmful alteration, disruption, or destruction that is expected to result from a project.

With the proposed minor amendments to the existing provisions in Bill C-68 for habitat banking and the collection of payments and fees, the *Fisheries Act* would contain the following set of regulatory tools to greatly enhance how fish habitat is protected:

1. Prescribed Waters regulations that exempt specific classes of waters such as tailings ponds.
2. Prescribed Works regulations that exempt specific types of works, such as clearing certain classes of drainage ditches, and prescribe the characteristics for their exemption.
3. Codes of Practice for projects that can fully avoid harm.
4. Regulations for the permitting of routine works that harm fish habitat, requiring the proponent to offset this harm through purchase or use of habitat bank credits, and/or payment-in-lieu of offset.
5. Permits for Designated Projects or Authorizations issued following project-specific review that require the proponent to offset harm to fish habitat through proponent-led offset or purchase, use of habitat bank credits, and/or payment-in-lieu of offset.

RECOMMENDATION

We recommend that Section 42 be amended to enable third-party habitat banking; Section 11 be amended to enable DFO to collect payment in lieu of offsets for certain classes of projects and designate these funds for restoration works; and, Section 35 be amended to enable these tools as offsets for harmful alteration, disruption, or destruction to fish habitat.

CONCLUSION

Bill C-68 is a strong piece of legislation that delivers on the government's commitments and mandate. Our recommendations on managing environmental flows, enhancing efforts to rebuild and sustain fish populations, and better addressing cumulative effects are intended to clarify and strengthen elements of the legislation to ensure a lasting, positive impact for the health of fisheries, waters and economies across Canada.

Much of the detail related to implementation of a renewed *Fisheries Act* will be established in policy and regulations. As such, we were encouraged by the commitment of \$284.2 million in Budget 2018 to build capacity within the Fisheries and Oceans Canada for successful implementation of a modern *Fisheries Act*. Environmental and conservation groups look forward to continued engagement with DFO, the regulated sector and other interests to help design an implementation framework that delivers meaningful outcomes for the protection and restoration of fish populations and fish habitats across the country.

SIGNATORIES

Atlantic Salmon Federation – Geoff Giffin, Director Regional Programs

BC Federation of Fly Fishers - Jesse Blake, President

Conservation Council of New Brunswick – Lois Corbett, Executive Director

David Suzuki Foundation – Jeffrey Young, Senior Science and Policy Analyst

Ducks Unlimited Canada – Jim Brennan, Director of Government Affairs

EcoJustice – Josh Ginsberg, Staff Lawyer

Ecology Action Centre - Shannon Arnold, Senior Coordinator

Forum for Leadership on Water (FLOW) - Tony Maas, Director

Freshwater Alliance – Lindsay Telfer, National Project Director

Living Oceans Society - Karen Wrysten, Executive Director

Northern Confluence Initiative – Nikki Skuce, Director

Oceana – Kim Elmslie, Campaign Director

Oceans North – Susanna Fuller, Senior Projects Manager

Pacific Streamkeepers Federation – ZoAnn Morten, Executive Director

POLIS Water Sustainability Project – Oliver Brandes, Project Lead

Skeena Watershed Conservation Coalition – Shannon McPhail, Executive Director

SkeenaWild Conservation Trust – Greg Knox, Executive Director

Trout Unlimited Canada – Jack Imhof, Director

West Coast Environmental Law Association – Linda Nowlan, Staff Lawyer

Watersheds Canada – Barbara King, Executive Director

Watershed Watch Salmon Society – Aaron Hill, Executive Director

The WaterWealth Project – Ian Stephen, Program Director

WWF Canada – Elizabeth Hendriks, Vice-President, Freshwater

ENDNOTES

1. Oceana Canada. (2018). Fishery Audit. <http://fisheryaudit.ca/>
2. West Coast Environmental Law and Forum for Leadership on Water. (2016). Habitat 2.0: A new approach to Canada's *Fisheries Act*. <https://www.wcel.org/resources/publication/habitat-20-new-approach-canadas-fisheries-act>
3. A number of the groups signatory to this submission have also provided the committee with their own briefs to share perspectives that support and in some cases go beyond what is included in this submission.
4. Richter, B.D, Mathews, R., Harrison, D.L. & Wigington, R. (2003). Ecologically sustainable water management: Managing river flows for ecological integrity. *Ecological Applications*, 13(1), 206-224.
5. The Brisbane Declaration. (2007, 2018). <http://riversymposium.com/about/brisbane-declaration/>
6. Linnansaari, T., Monk, W.A., Baird, D.J. and Curry, R.A. (2013). Review of approaches and methods to assess Environmental Flows across Canada and internationally. <http://www.dfo-mpo.gc.ca/library/348885.pdf>
7. Fisheries and Oceans Canada. (2013). Framework for Assessing the Ecological Flow Requirements to Support Fisheries in Canada, Canadian Science Advisory Secretariat, Report 2013/017. http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2013/2013_017-eng.html
8. Binkley, A. 2019. Amendment to *Fisheries Act* could threaten farmers across the country, say CCA and CFA. National Newswatch. <https://www.nationalnewswatch.com/2019/01/28/amendment-to-fisheries-act-could-threaten-farmers-across-the-country-say-cca-and-cfa/#.XFzF4i3Myu1>
9. Orphan Well Association v. Grant Thornton Ltd. 2019 SCC 5 at paragraph 66.
10. Reference re: Pan-Canadian Securities Regulation, 2018 SCC 48 at paragraphs 17-18. And see Saskatchewan (A.G.) v. Lemare Lake Logging Ltd., [2015] 3 S.C.R. 419, 2015 SCC 53, at paragraphs 21 and 22.
11. Mattison, J., Nowlan, L., Lebel, M. and Orr, C. (2014). Water for Power, Water for Nature: The Story of BC Hydro's Water Use Planning Program. WWF Canada. http://d2akr19rvxl3z3.cloudfront.net/downloads/wup_report_r04.pdf
12. UNFA Article 5 b) states that nations will ensure that [fishery management] measures are based on the best scientific evidence available and are designed to maintain or restore stocks at levels capable of producing maximum sustainable yield."
13. The FAO Code of Conduct for Responsible Fisheries, Section 7.2.1, states that nations should adopt appropriate measures, based on the best scientific evidence available, which are designed to maintain or restore stocks at levels capable of producing maximum sustainable yield as qualified by relevant environmental and economic factors, including the special requirements of developing countries.
14. Neubauer, P., Jensen, O.P., Hutchings, J.A. and Baum, J.K., 2013. Resilience and recovery of overexploited marine populations. *Science*, 340(6130), pp.347-349.
15. Hutchings J.,A. and Baum J.K.2005. Measuring marine fish biodiversity: temporal changes in abundance, life history, and demography. *Phil. Trans. R. Soc. B* 360, 315-338.
16. Hutchings, J.A. and Kuparinen, A., 2017. Empirical links between natural mortality and recovery in marine fishes. *Proc. R. Soc. B*, 284(1856), p.20170693.
17. Quigley, J. T., & Harper, D. J. (2006). Effectiveness of fish habitat compensation in Canada in achieving no net loss. *Environmental Management*, 37(3), 351-366.