Submission to the Standing Committee on Fisheries and Oceans regarding its Marine and Coastal Protection study

Brief on the benefits of Marine Protected Areas

Introduction

There is scientific consensus that protecting 30% of lands and waters is needed to avoid catastrophic climate change, conserve species, and secure essential ecosystem services.[1] In response, the federal government has publicly committed to protecting 30% of Canada's land and waters by 2030.[2] Science also supports the use of Marine Protected Areas (MPAs), which are a key part of the commitment to protect the marine environment.[3] In the face of overfishing and climate change, MPAs can provide a host of benefits: they can provide refuges for marine life, buffer against the impacts of climate change, protect blue carbon sinks, act as "living laboratories" for research, increase tourism and recreation, create jobs, benefit fisheries in the long-term, protect culturally important areas and species, and further reconciliation with Indigenous nations.[4]

In fact, research shows that marine life could substantially recover within approximately 30 years with concerted action including effective MPAs.[5] Expanding MPAs generally yields net economic benefits (research shows benefits exceed costs by anywhere from 1.4-20 times)[6] and the potential creation of tens of thousands of jobs. [7]

Ocean conservation, including MPAs, is politically very popular: in a 2024 poll, 85% of British Columbians polled supported the BC Government's commitment to protect 30% of the province's land and water by 2030, and 82% express support for creating MPAs.[8] In a 2022 Canada-wide poll, most respondents had never heard of MPAs, but after they were explained to them, 97% of respondents either strongly or somewhat supported them.[9]

What are Marine Protected Areas?

Like nature reserves on land, MPAs set aside parts of the ocean where certain human activities are limited. [10] This

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[1] Dinerstein E. *et al. Sci. Adv.* **5**, eaaw2869 (2019). https://doi.org/10.1126/sciadv.aaw2869

[2] Environment and Climate Change Canada. Canada helps lead the world to agreement on the monumental Kunming–Montréal Global Biodiversity Framework (2022). **https://www.canada.ca/en/environment-climate-change/news/2022/12/canada-helps-lead-the-world-to-agreement-on-the-monumental-kunming-montreal-global-biodiversity-framework.html**

[3] Fisheries and Oceans Canada. *About federal marine conservation tools* (2025). **https://www.dfo-mpo.gc.ca/oceans/protection-conservation/tools-outils/index-eng.html**

[4] Marcos C., Díaz D., Fietz K., *et al. Front. Mar. Sci.* **8**, 613819 (2021). **https://doi.org/10.3389/fmars.2021.613819**

[5] Duarte C.M., Agusti S., Barbier E., *et al. Nature* **580**, 39–51 (2020). **https://doi.org/10.1038/s41586-020-2146-7**

[6] Brander L.M. *et al. Mar. Policy* **116**, 103953 (2020). **https://doi.org/10.1016/j.marpol.2020.103953**; World Wide Fund for Nature. *Marine protected areas: Smart investments in ocean health* (WWF, 2015). **https://files.worldwildlife.org/wwfcmsprod/files/Publication/file/8u8uxvczvw_Smart_Investments_in_Ocean_Health**, citing Brander L., *et al. The benefits to people of expanding marine protected areas* (Institute for Environmental Studies, VU University Amsterdam & WWF, 2015). **https://www.iwlearn.net/documents/28509** [***WWF 2015***]

[7] For example, Australia's Great Barrier Reef support approximately 64,000 jobs: O'Mahony J. et al. Deloitte Access Economics (2017). At what price? The economic, social and icon value of the Great Barrier Reef. **https://www.barrierreef.org/uploads/deloitte-au-economics-great-barrier-reef-230617.pdf** [***O'Mahony 2017***]

[8] Canadian Parks and Wilderness Society – BC (CPAWS-BC). *Support for nature conservation is unwavering across British Columbians, survey finds* (2024). **https://cpawsbc.org/support-for-nature-conservation-is-unwavering-across-british-columbians-survey-finds/**

[9] SeaBlue Canada. SeaBlue Canada releases polling on Canadian perceptions around marine protected areas (2023). **https://seabluecanada.org/resource/seablue-canada-releases-polling-on-canadian-perceptions-around-marine-protected-areas/** [***SeaBlue Canada 2022***]

[10] Dudley N. (ed.) *Guidelines for applying protected area management categories* (IUCN, 2008). **https://portals.iucn.org/library/sites/library/files/documents/pag-021.pdf** – The International Union for the Conservation of Nature (IUCN) defines a protected area as: "…a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values)."

gives marine life and habitats the space to recover and remain healthy over the long term. They also safeguard food sources while strengthening the ocean's ability to withstand climate change and other pressures.

Extensive scientific study reveals that prohibiting extractive and industrial activities is critical to the success of MPAs;[11] allowing for these activities undermines the goals of MPAs. To this end, Canada enacted the MPA Protection Standard[12], which prohibits four of the most harmful industrial activities (oil and gas activity, mineral exploration and exploitation, bottom trawl fishing and dumping) in all federal MPAs established after April 2019.

MPAs restore ecosystems

Overfishing and destructive fishing practices have driven significant declines in BC's marine ecosystems.[13]

Fisheries management is not enough

Some critics of MPAs claim that Canada has "world-class" fisheries management.[14] However, the data show a different story. Fisheries management practices in Canada have failed in their goal to keep fish stocks healthy:

- Only 35% of Canadian fish stocks are considered healthy;
- 35% of Canadian fisheries have an uncertain or unknown status due to insufficient information; and
- Fisheries and Oceans Canada has completed rebuilding plans for only 12 of 32 critically depleted stocks, despite these plans being legally required under the *Fisheries* Act since 2019.[15]

Many critics of MPAs overlook this evidence and downplay documented weaknesses of current fisheries management. Fisheries management has allowed harmful fishing practices to continue in Canadian waters. Bottom trawling in particular has caused significant damage in BC, destroying over half of the large glass sponge reefs in Hecate Strait before federal fisheries closures were put in place in 2002, and then later protected by an MPA in 2017.[16] Bottom trawling also contributes to the resuspension of the carbon stored in seafloor sediments, disrupting this important carbon sink.[17] Bottom trawling also generates substantial bycatch, including 28,117 salmon in 2022/23, 93% of them Chinook[18] – which is the endangered Southern Resident Killer Whales' main food source.[19]

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[11] The studies below illustrate how MPA outcomes tend to deliver strong conservation outcomes and outperform partial-protection MPAs: Grorud-Colvert K. *et al. Science* **373**, eabf0861 (2021). **https://doi.org/10.1126/science.abf0861**; Pike E.P. *et al. Conserv. Lett.* **17**, e13020 (2024). **https://doi.org/10.1111/conl.13020**; Edgar G.J. *et al. Nature* **506**, 216–220 (2014). **https://doi.org/10.1038/nature13022**; Lester S.E. *et al. Mar. Ecol. Prog. Ser.* **384**, 33–46 (2009). **https://doi.org/10.3354/meps08029**; Sala E., Giakoumi S. *ICES J. Mar. Sci.* **75**, 1166–1168 (2018). **https://doi.org/10.1093/icesjms/fsx059**

[12] Fisheries and Oceans Canada. *Marine Protected Areas (MPA) Protection Standard* (2023). **https://www.dfo-mpo.gc.ca/oceans/mpa-zpm/protection-standard-norme-protection-eng.html**

[13] Reid M. *et al. People Nat.* **4**, 1052–1070 (2022). **https://doi.org/10.1002/pan3.10380** [***Reid 2022***] – Describes declines of multiple culturally and/or ecologically significant species in the Central Coast; declines reflect fishery impacts exacerbated by climate change.

[14] For examples, see: Hilborn R. *Nature* **535**, 224–226 (2016). **https://doi.org/10.1038/535224a** –Argues MPAs aren't a panacea and that strong fisheries management can deliver conservation without large no-take areas [***Hilborn 2016***]; Hilborn R., *et al*. *ICES J. Mar. Sci.* **78**, 2271–2279 (2021). **https://doi.org/10.1093/icesjms/fsaa139** – Explores trade-offs between area-based protection and sustaining fish harvest; the authors imply well-managed fisheries can meet objectives without broad closures.

[15] Oceana Canada. *Fishery Audit 2024: Unlocking Canada's Potential for Abundant Oceans* (Oceana Canada, 2024). **https://oceana.ca/en/reports/fishery-audit-2024** [***Oceana Fishery Audit 2024***] – Note, the number of rebuilding plans released has increased to 12 since the Oceana report was released; see: Oceana Canada. *Canada releases first-ever legally mandated plans to rebuild depleted fisheries* (2025). **https://oceana.ca/en/press-releases/canada-releases-first-ever-legally-mandated-plans-to-rebuild-depleted-fisheries/**

[16] IUCN. *Canada protects unique glass sponge reefs* (2017). **https://iucn.org/news/protected-areas/201702/canada-protects-unique-glass-sponge-reefs**

[17] Zhang W., Porz L., Yilmaz R., *et al. Nat. Geosci.* **17**, 1268–1276 (2024). **https://doi.org/10.1038/s41561-024-01581-4**

[18] Lagasse C.R. et al. Review of salmon bycatch in the Pacific Region 2022/23 groundfish trawl fishery and preliminary results of an enhanced monitoring program (Canadian Manuscript Report of Fisheries and Aquatic Sciences 3273, Fisheries and Oceans Canada, 2024). **https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/41221618.pdf** – DFO reports an estimated 28,117 Pacific salmon were caught as bycatch in from February 2022 to February 2023, including 26,273 Chinook (≈93%), for Option A license holders.

[19] Pacific Wild. *Dragged to Death – Investigative Mapping on B.C.'s Industrial Trawling* (2025). **https://pacificwild.org/dragged-to-**

These facts make clear that it is essential that some areas be permanently off-limits to bottom trawling, which requires that the area be legally protected as an MPA.

Furthermore, the models upon which fisheries management decisions are based contain weaknesses and inaccuracies that could lead to overfishing and further stock decline. Conventional fisheries management in Canada has long centered on maximum sustained yields (MSY) for single species. Relying on MSY as a single-species target is widely criticized as outdated and misleading, because it overlooks species interactions, habitats, and broader ecosystem roles.[20] Standard stock assessments also do not yet fully account for uncertainties inherent to climate change effects on species distributions and biological productivity. Combined with persistent data gaps and limited follow-through on rebuilding requirements, fisheries management has failed to protect many key species in BC – Northern abalone and Pacific sardine remain critically depleted, and many salmon and some rockfish populations remain of concern with limited public rebuilding plans.[21] The single-species focus of conventional fisheries management also does not consider the food source of the focus species (for example, the forage fish that feed salmon), which can result in "ecological surprises" and derail recovery efforts.[22] MPAs act as an insurance policy in light of these uncertainties and gaps left by fisheries management – serving as refuges or safe havens for marine species in the face of the multitude of threats.

Critics of MPAs often conflate their purposes with that of fisheries management. Whereas fisheries measures regulate harvest, MPAs protect whole ecosystems and the ecological connections that sustain them and are typically long-term or permanent. MPAs can also limit or prohibit non-fishing activities that are harmful to marine life – such as oil and gas exploration, seabed mining, bottom trawling or ocean dumping – and address cumulative impacts, providing safeguards well beyond fishing. [23] This broader scope delivers benefits that fisheries measures alone cannot (see sections below) and MPAs can serve as an insurance policy when fisheries management falls short. In practice, MPAs and fisheries management are complementary – not either/or. Used together, they offer the strongest path to rebuild biodiversity, enhance climate resilience, and sustain fisheries and coastal livelihoods.[24]

MPAs help ecosystems recover

MPAs protect access to and quality of marine species' habitat, including key areas for feeding, breeding, wintering and resting, as well as migratory routes. They can increase marine species' resilience in the face of threats from shipping and other marine industry, as well as pollution. MPAs can act as refuges or safe havens to these animals, including by reducing underwater noise and the risk of vessel strikes and entanglement in fishing gear through

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death-investigative-mapping-on-b-c-s-industrial-trawling/ – This investigation by Pacific Wild tracked just nine of more than 40 factory trawlers operating in BC and found that over 13 years they dredged roughly 89,700 km² (an area larger than Ireland) off BC's coast, impacting both seabed and midwater ecosystems. Pacific Wild reported that during the 2022–2023 season, the Pacific Region mid-water groundfish trawlers caught over 28,000 salmon as bycatch, 93% of which were Chinook salmon. Using AIS vessel data and ESRI Arc GIS, Pacific Wild's newest investigation shows that trawling routes repeatedly intersect critical biodiversity hotspots and Chinook migration paths. These areas are essential feeding grounds for endangered Southern Resident killer whales.

[20] Roberts C., Béné C., Bennett N., *et al. npj Ocean Sustain.* **3**, 41 (2024). **https://doi.org/10.1038/s44183-024-00078-2**
Reid 2022, see note 13 –This research describes observed declines of multiple culturally and/or ecologically significant species in the Central Coast, highlighting the limitations of current fisheries management policy for sustaining species, habitats and ecosystems.

[21] Oceana Fishery Audit 2024, see note 15.

[22] Wells B.K., Huff D.D., Burke B.J., *et al. Front. Mar. Sci.* **7**, 342 (2020). **https://doi.org/10.3389/fmars.2020.00342**

[23] Hewson S., Nowlan L., Lloyd-Smith G., Carlson D., Bissonnette M. *Protecting the Coast and Ocean: A Guide to Marine Conservation Law in British Columbia* (UBC Press & West Coast Environmental Law, 2023).
https://www.ubcpress.ca/asset/84192/1/9780774865517_OA.pdf [***Hewson 2023***]

[24] Gaines S.D. *et al. Proc. Natl Acad. Sci. USA* **107**, 18286–18293 (2010). **https://doi.org/10.1073/pnas.0906473107**
Roberts C.M. *et al. Proc. Natl Acad. Sci. USA* **114**, 6167–6175 (2017). **https://doi.org/10.1073/pnas.1701262114**.
Sala E. *et al. Nature* **592**, 397–402 (2021). **https://doi.org/10.1038/s41586-021-03371-z**

measures such as speed limits, routing, and gear restrictions.

Some critics of MPAs argue that their benefits are not supported by science. However, there is overwhelming science to support the ecosystem benefits of well-planned and managed MPAs. Within their borders, MPAs provide a refuge for fish to grow larger and produce more offspring, giving exploited populations time and space to return to healthy levels. A global synthesis of 124 fully protected MPAs found that fish, invertebrates and seaweed combined had on average 4.5 times more biomass, 28% larger body size, and 21% higher species richness within MPAs than in other areas.[25] And MPAs have been shown to help damaged marine ecosystems recover from the harmful effects of bottom trawling fisheries.[26]

MPAs buffer against climate change impacts (a climate adaptation benefit)

MPAs have been shown to support greater biodiversity (*e.g.*, fully protected MPAs and fisheries closures increased species richness by an average of 23%[27]). Protecting biodiversity helps maintain ecosystem functioning and can increase resistance and recovery to climate stress.[28] For example, in Baja California, Mexico, pink abalone populations remained stable within no-take reserves during a climate-driven hypoxia mass-mortality event, because protected adults were larger and produced more eggs.[29] And a study of California MPAs found that fully protected reserves enhanced kelp forests' resistance to, and recovery from, marine heatwaves.[30]

MPAs protect blue carbon (a climate mitigation benefit)

In addition to benefits for climate change adaptation, MPAs can help mitigate climate change by acting as a blue carbon solution.[31] Blue carbon refers to the capacity of marine ecosystems to sequester and store carbon. Marine ecosystems, especially coastal habitats like salt marshes, kelp forests and seagrass beds, are increasingly recognized for their role in mitigating climate change through carbon sequestration. These coastal habitats are increasingly vulnerable to development and ocean warming, underscoring the value of protection.

Using MPAs to preserve, restore and expand these ecosystems can help fight climate change by ensuring that blue carbon habitats continue to remove and store significant amounts of carbon[32] – rather than releasing carbon. Protecting coastal habitats such as wetlands within MPAs can also help to protect coastal communities from extreme storms, flooding, and erosion.

MPAs protect the economy

Investing in MPAs makes economic sense: a 2020 study in Marine Policy estimated that the global impact of expanding MPAs can return about $1.40 to $2.70 in benefits for every $1 invested, depending on where and how protection is put in place.[33] When MPA expansion is paired with other sustainable ocean actions, overall benefit–cost ratios of approximately 3:1 to 12:1 are achievable.[34] A 2015 study commissioned by World Wide Fund for

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[25] Lester S.E., *et al. Mar. Ecol. Prog. Ser.* **384**, 33–46 (2009). **https://doi.org/10.3354/meps08029**
[26] A Scandinavian study found significant shifts in the macrofauna community within a large no-take zone area over 12 years following its closure to bottom-trawling, suggesting a long-term recovery trend towards a non-trawled state: Sköld M., *et al. Conserv. Sci. Pract.* **7**, e70037 (2025). **https://doi.org/10.1111/csp2.70037**
[27] Worm B., *et al. Science* **314**, 787–790 (2006). **https://doi.org/10.1126/science.1132294**
[28] Olguín-Jacobson C., *et al. Funct. Ecol.* **39**, 1879–1893 (2025). **https://doi.org/10.1111/1365-2435.70060**
[29] Micheli F., *et al. PLoS One* **7**, e40832 (2012). **https://doi.org/10.1371/journal.pone.0040832**
[30] Kumagai J.A., *et al. Glob. Change Biol.* **30**, e17620 (2024). **https://doi.org/10.1111/gcb.17620**
[31] Jankowska E., *et al. Proc. Natl Acad. Sci. USA* **119**, e2121705119 (2022). **https://doi.org/10.1073/pnas.2121705119**
[32] Merwin A., *et al. Climate-smart marine protected areas for mitigation and adaptation policy* (Ocean Conservancy, 2020). **https://oceanconservancy.org/wp-content/uploads/2025/09/Climate-Smart-MPAs-Brief_FINAL_07.08.2020.pdf**
[33] Brander L.M. *et al. Mar. Policy* **116**, 103953 (2020). **https://doi.org/10.1016/j.marpol.2020.103953**
[34] Konar M. *et al. A Sustainable Ocean Economy for 2050: Approximating Its Benefits and Costs.* High Level Panel for a Sustainable Ocean Economy (2020) **https://medblueconomyplatform.org/wp-content/uploads/2020/11/file-library-422ca81cf0f124480163.pdf**; Stuchtey M.R. *et al. Ocean Solutions That Benefit People, Nature and the Economy.* High Level Panel for a Sustainable Ocean Economy

Nature found that expanding and effectively managing MPAs can result in benefits worth from three times, up to 20 times, the cost of implementation.[35] MPAs can create tens of thousands of jobs (for example, Australia's Great Barrier Reef supports approximately 64,000 jobs). [36] Studies continuously show a positive rate of return on investment in marine conservation for the global economy.

MPAs benefit fisheries

While MPAs can create short-term costs with respect to fisheries, research shows they deliver long-term gains. By protecting habitats and giving fish space to recover, MPAs help rebuild stocks, bolster food security, improve catches, and support the communities that rely on them.

Critics argue MPAs will harm fisheries by causing job losses, reducing seafood supplies, or intensifying fishing in smaller areas.[37] For the Great Bear Sea (Northern Shelf Bioregion) MPA Network, a 2020 industry-sponsored analysis is frequently cited to claim the commercial fishing industry would lose about $100 million from the MPA network.[38] Yet several features limit how much weight that figure should be given: the analysis was modelled on an early 2019 draft of the MPA Network (not the later Network Action Plan endorsed in 2023); it treats all MPAs as fully closed to fishing even though many would allow some fishing; it adds extra "buffer zones" around MPAs that inflate estimated costs; and its methods lack transparency, with multiple adjustments that are hard for third parties to check or replicate. The reality is that the potential impact of the MPA network to commercial fisheries to approximately 8% of commercial fishing effort across the region (with most MPAs remaining open to sustainable small-scale, non-bottom contact fishing).[39] This equates to a short-term impact of approximately $9 million in annual profits, distributed across 1,150 commercial fishing vessels operating in the area – as opposed to the $100 million impact predicted by the previous report. These figures are based on a socioeconomic overview[40] conducted by the MPA Network's partner Nations, Canada and BC, with a clear and transparent methodology, and are consistent with studies from other regions[41] which demonstrate that, with proper planning, the short-term impacts of MPAs on fisheries are generally much less severe than feared.

(2020). **https://oceanpanel.org/wp-content/uploads/2022/06/full-report-ocean-solutions-eng.pdf**

[35] *WWF 2015*, see note 6.

[36] *O'Mahony 2017*, see note 7.

[37] The studies often cited are: *Hilborn 2016*, see note 14; Blampied S.R., Sheehan E.V., Attrill M.J., Binney F.C.T., Rees S.E. *Fish. Res.* **259**, 106555 (2023). **https://doi.org/10.1016/j.fishres.2022.106555** – Review of socio-economic impacts; the most immediate effects include displacement and changes in gear/effort. **https://doi.org/10.1016/j.fishres.2022.106555**; O'Leary B.C. *et al. BioScience* **68**, 359–370 (2018). **https://doi.org/10.1093/biosci/biy021** – Section summarizing common criticisms of large MPAs (*e.g.*, unnecessary if fisheries are well managed). **https://doi.org/10.1093/biosci/biy021**; Di Lorenzo M., Guidetti P., Di Franco A., Calò A., Claudet J. *Fish Fish.* **21**, 906–915 (2020). **https://doi.org/10.1111/faf.12469** –Provides clear evidence of the spillover effect from MPAs but has been spun by critics of MPAs to say that spillover effects are confined to areas close to MPA boundaries (known as "fishing the line", which is actually an indicator that an MPA is effectively managed and well located to increase productivity).

[38] GSGislason & Associates Ltd. *Northern Shelf Bioregion MPA – Economic Impacts* (BC Ministry of Agriculture, 2020). **https://www2.gov.bc.ca/assets/gov/data/statistics/business-industry-trade/industry/fisheries-aquaculture/nsb_impacts_on_the_commercial_fishery_002.pdf**

[39] Our Great Bear Sea. *Commercial fishing in the Great Bear Sea MPA Network – FAQ* (2024). **https://ourgreatbearsea.ca/wp-content/uploads/2024/07/FAQ_Commercial-Fishing-in-the-Great-Bear-Sea-MPA-Network.pdf** [***Our Great Bear Sea, FAQ***]

[40] MPA Network – Northern Shelf Bioregion. MPA Network Action Plan – Compendium 3: Socio-Economic Overview of the Northern Shelf Bioregion (2022). **https://mpanetwork.ca/wp-content/uploads/2022/11/NAP-Compendium-3-web.pdf** – Prepared by the MPA Network partners (First Nations, Canada, B.C.), this is the document that underpins the "~8% of commercial fishing effort by landed value" and "~$9M annual profits" figures. (For a plain language summary, see *Our Great Bear Sea, FAQ*, note 39)

[41] See results of California's MPA network, for example: Costello M.J. *Sci. Mar.* **88**, e080 (2024). **https://doi.org/10.3989/scimar.05417.080** [***Costello 2024***] – Decadal evaluation notes ecological gains and documents human-use trends; socio-economic effects are complex/modest, not uniformly negative. Caselle J.E. *et al. A synthesis of ecological and social outcomes from the California marine protected area (MPA) network* (NCEAS Working Group final report to the California Ocean Protection Council & California Department of Fish and Wildlife, 2023). **https://www.opc.ca.gov/webmaster/_media_library/2023/01/NCEAS_MPA_Report_Final.pdf**

Furthermore, the MPA Network is likely to result in long-term benefits to the fisheries economy. Research has shown that well-designed MPAs can significantly contribute to fisheries productivity. Through providing a refuge where fish can grow larger, live longer and produce more offspring, MPAs can help in the recovery of overexploited populations, thus enhancing the viability and longevity of associated fisheries. MPAs can also benefit fisheries via the "spillover effect" with various studies (including many in contexts similar to BC) showing increased catch-per-unit effort (CPUE), mean body size, yield, and revenues following MPA implementation:

- A global study reviewed 81 publications about MPAs in 37 countries and found that their establishment has resulted in benefits to commercial fisheries in 25 countries spanning a range of climates and habitat types. The study provides 48 examples of economic benefits to fisheries near MPAs, including increased fish stocks and catch volumes, higher reproduction and larval "spillover" to fisheries, and larger fish and lobsters close to MPAs. The study also found no evidence of net costs to fisheries in the cases reviewed, despite claims in the research literature of fishery displacement due to MPA designation;[42]
- A global analysis of nine large-scale MPAs found that CPUE in tuna purse seine fisheries increased by 12% to 18% in nearby fished areas, suggesting spillover benefits for highly migratory species such as tuna;[43]
- In California, a 35% reduction in fishing area due to MPA designation was more than compensated for by a 225% increase in total catch of California spiny lobster in adjacent fishing grounds after only 6 years;[44]
- In the California Central Coast, the combined value of commercial landings for the ports of Morro Bay and Monterey was US$10.6 million; 10 years after MPA establishment, this had more than doubled to US$22.1 million;[45]
- In New Zealand, evidence shows that 10.6% of newly settled juvenile snappers sampled up to 40 km outside of a no-take MPA were the offspring of adult snappers from the MPA. This suggests a significant boost to the commercial fishery of $NZ 1.49 million catch landing value per annum and $NZ 3.21 million added from recreational fishing activity associated spending per annum;[46]
- In Spain's Columbretes Islands, a mean annual net gain of 10% of lobster catch (in weight) was observed during an 8- to 17-year protection period, indicating that harvested spillover from the MPA offset the initial loss of yield from fishing grounds set aside in the MPA);[47] and
- A global meta-analysis of 23 fully protected MPAs found that fish biomass and abundance outside MPAs were higher near MPA borders (than at more distant sites), with effects stronger for species of high commercial value.[48]

These studies and many others show that MPAs can boost fisheries and coastal economies by enhancing catches in nearby waters within just a few years.

Finally, fisheries are not the only economy supported by the ocean. MPAs allow for the creation and development of additional economic benefits by supporting other ocean economies. For example, the MPA Network in the Great Bear Sea is forecasted to bring hundreds of millions of dollars in new investment to the coast, more than 3,000 new jobs and over 200 new businesses across a range of ocean-based industries over the next 20 years.[49]

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[42] *Costello 2024*, see note 41.
[43] Lynham J., Villaseñor-Derbez J.C. *Science* **386**, 1276–1281 (2024). **https://doi.org/10.1126/science.adn1146**
[44] Lenihan H.S. *et al. Sci. Rep.* **11**, 2663 (2021). **https://doi.org/10.1038/s41598-021-82371-5**
[45] Murray S., Hee T.T. *Ocean Coast. Manag.* **182**, 104920 (2019). **https://doi.org/10.1016/j.ocecoaman.2019.104920**
[46] Qu Z., Thrush S., Parsons D., Lewis N. *Mar. Policy* **134**, 104792 (2021). **https://doi.org/10.1016/j.marpol.2021.104792**
[47] Goñi R. *et al. Mar. Ecol. Prog. Ser.* **400**, 233–243 (2010). **https://doi.org/10.3354/meps08419**
[48] Di Lorenzo M., Guidetti P., Di Franco A., Calò A., Claudet J. *Fish Fish.* **21**, 906–915 (2020). **https://doi.org/10.1111/faf.12469**
[49] Fisheries and Oceans Canada. *Great Bear Sea (Northern Shelf Bioregion)* (2024). **https://www.dfo-mpo.gc.ca/oceans/collaboration/indigenous-led-projects-dirigees-par-autochtones/great-bear-sea-mer-eng.html**

MPAs result in increased tourism revenue

MPAs provide important benefits to local communities by increasing the quantity and quality of tourism, and especially ecotourism, to an area.[50] Increased tourism generates revenue for transportation, tour operators, entertainment, restaurants and retail. Ecotourism linked to MPAs often channels spending to local businesses and can provide an alternative income source to fishing (*e.g.*, dive and whale-watching operations).[51]

In Quebec's Saguenay St. Lawrence Marine Park, which protects key habitat for beluga whales and other marine mammals, whale watching operators must obtain permits and training, and are committed to responsible whale watching practices that support education and conservation. This allows visitors to continue experiencing the MPA while advancing the park's protection goals.[52]

The Great Bear Rainforest (GBR) spans 6.4 million hectares on the north and central coast of BC and is subject to the 2016 GBR Agreement that protects 85% of the forest.[53] The GBR is home to much Indigenous tourism.[54] For example, the Spirit Bear Lodge in Klemtu, BC, is owned and operated by the Kitasoo/Xai'xais Nation and offers access to wildlife viewing areas and cultural sites within the Nation's traditional territory, as well as accommodation. The Lodge employs about 35 people in a community of roughly 300 and has had a positive impact on the community through a variety of conservation initiatives.[55]

MPAs create jobs

MPAs act to safeguard the natural resources on which many marine-based sectors depend. Along with helping to sustain jobs in the fisheries sector, properly managed MPAs can greatly benefit nature-based tourism. Good, stable jobs in MPA planning, administration, conservation, management, monitoring and research can also be created. By supporting livelihoods and creating new economic opportunities, MPAs can help to stabilize and diversify household income, which often benefits household food security as well.[56]

The Gwaii Haanas National Park Reserve and Haida Heritage Site employs about 40 people year-round and about 60 in the operating season, reflecting the kinds of positions MPAs create. And as mentioned, the Great Bear Sea MPA Network is forecasted to bring about more than 3,000 new jobs and over 200 new businesses over the next 20 years, along with 32,000 days of skills training.[57]

MPAs benefit people

MPAs support food security and human health

Fish and other seafood products provide sustenance to billions of people. Food from the ocean is also highly nutritious, containing vital micronutrients,[58] including omega-3 fatty acids, vitamins (D, A and B) and minerals

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[50] European Commission. *Study on the economic benefits of MPAs: Final report* (Publications Office of the European Union, 2018). **https://doi.org/10.2826/449575**

[51] Casimiro D. *et al. Front. Mar. Sci.* **9**, 1002677 (2023). **https://doi.org/10.3389/fmars.2022.1002677**

[52] Parks Canada. *Saguenay–St. Lawrence Marine Park: Backgrounder* (2023). **https://www.canada.ca/en/parks-canada/news/2023/03/saguenayst-lawrence-marine-park.html**

[53] Province of British Columbia. Great Bear Rainforest agreement highlights (2024). **https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/great-bear-rainforest/gbr-agreement-highlights**

[54] Indigenous Tourism BC. *The Great Bear Rainforest* (2025). **https://www.indigenousbc.com/stories/the-great-bear-rainforest/**

[55] Coast Funds. *Indigenous ecotourism offers many benefits to communities* (2019). **https://coastfunds.ca/news/indigenous-ecotourism-offers-many-benefits-to-communities/**

[56] Examples include: *Costello 2024*, see note 41; SeaBlue Canada. *Tourism in marine protected areas: Opportunities, risks, and benefits of sustainable tourism* (SeaBlue Canada, 2023). **https://seabluecanada.org/wp-content/uploads/2023/06/Seablue-Tourism-Report-WEB-VERSION.pdf**; Pascal N. *et al. Ecosyst. Serv.* 30, 3–13 (2018). **https://doi.org/10.1016/j.ecoser.2017.10.017**

[57] The Nature Conservancy. *Great Bear Sea PFP Agreement Creates New Pathway for Indigenous-Led, Collaborative Conservation* (2024). **https://www.nature.org/en-us/newsroom/great-bear-sea-pfp/**

[58] FAO. *The State of World Fisheries and Aquaculture 2024 – Blue Transformation in action* (FAO, 2024).

(calcium, zinc, iron and iodine) that can be limited in many land-based diets.[59] In Canada, commercial fisheries are the backbone of many local economies, providing jobs for many people from coast to coast to coast. For Indigenous people, fishing has always been a source of food and trade, and an integral part of community health, cultural identity, and way of life.[60]

Economic and food security losses from stock declines are already a major issue for many First Nations.[61] Of particular concern are declines of foundation species like salmon, herring, rockfish, and eulachon, which play a critical role as traditional food sources and in ceremonial, cultural and social events.[62]

For the same reasons that well-designed MPAs can help rebuild and sustain abundant fish stocks, they can also help support food security over the long term.

MPAs provide opportunities for co-governance and protecting culture

MPAs are most effective when they are created through fair and inclusive approaches that support both healthy oceans and thriving communities.[63] Research shows that when Indigenous nations and local voices are part of the decision-making process, MPAs are better supported and deliver stronger ecological and economic results.[64]

MPAs are opportunities for Indigenous and Crown governments to collaboratively govern ocean areas. One example of co-governance of an MPA is the SGaan Kinghlas-Bowie Seamount MPA. The Haida Nation and the government of Canada signed a co-governance agreement in 2007, and in 2008 the area was designated as an MPA under the federal *Oceans Act*. The MPA is managed by a Management Board with equal representation from each government that seeks to make decisions by consensus. Planning for the MPA is guided by Haida law and principles, such as respect and interconnectedness.[65]

Indigenous nations will also have a lead role in governing the Great Bear Sea MPA Network, which was co-developed with 17 First Nations in partnership with British Columbia and Canada. It draws on Western science, traditional knowledge, and stakeholder input.[66]

In addition to co-governance opportunities, MPAs can protect culturally important areas and species. For example, the Great Bear Sea MPA Network will protect Yelloweye Rockfish, which is a culturally-important species to coastal First Nations – and which Indigenous fishers have observed decline in recent decades.[67]

MPAs support emotional well-being

MPAs provide 'non-use' values – the intangible values derived independent of any present or future use. These

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https://doi.org/10.4060/cd0683en; Hicks C.C. *et al. Nature* **574**, 95–98 (2019). **https://doi.org/10.1038/s41586-019-1592-6**

[59] Thilsted S.H. *et al. Food Policy* **61**, 126–131 (2016). **https://doi.org/10.1016/j.foodpol.2016.02.005**

[60] Marushka L. *et al. Can. J. Public Health* **112**(Suppl. 1), 64–80 (2021). **https://doi.org/10.17269/s41997-021-00481-z** [***Marushka 2021***]

[61] *Marushka 2021*, see note 60.

[62] *Reid 2022*, see note 13.

[63] Gill D.A. *et al. Nature* **543**, 665–669 (2017). **https://doi.org/10.1038/nature21708** [***Gill 2017***]

[64] IPBES. *Summary for policymakers of the global assessment report on biodiversity and ecosystem services* (IPBES, 2019). **https://files.ipbes.net/ipbes-web-prod-public-files/inline/files/ipbes_global_assessment_report_summary_for_policymakers.pdf**; Ban N.C., Frid A. *Mar. Policy* **87**, 180–185 (2018). **https://doi.org/10.1016/j.marpol.2017.11.023**; Di Franco A. *et al. Sci. Rep.* **6**, 38135 (2016). **https://doi.org/10.1038/srep38135**; Frid A. *How Indigenous Knowledge Could Save Fishing* (Nautilus, 2025). **https://nautil.us/how-indigenous-knowledge-could-save-fishing-1212406/**

[65] Fisheries and Oceans Canada. SG̲áan K̲ínghlas-Bowie Seamount Marine Protected Area (SK̲-B MPA) (2025) **https://www.dfo-mpo.gc.ca/oceans/mpa-zpm/sgaan-kinghlas-bowie/index-eng.html**; Government of Canada. Canada's New Government and Haida Agree to Establish Bowie Seamount as a Marine Protected Area (2007). **https://www.canada.ca/en/news/archive/2007/06/canada-new-government-haida-agree-establish-bowie-seamount-marine-protected-area.html**

[66] MPA Network – Northern Shelf Bioregion. *MPA Network Action Plan* (2022). **https://mpanetwork.ca/wp-content/uploads/2022/11/MPA_Network-Action-Plan_web.pdf**

[67] Eckert L.E. *et al. Aquat. Conserv.: Mar. Freshw. Ecosyst.* **28**, 158–166 (2018). **https://doi.org/10.1002/aqc.2834**

values are often difficult to measure and include bequest, existence, and option values.[68]

Many MPAs allow recreational activities to continue, such as scuba diving, snorkeling, recreational fishing, surfing, wildlife watching, sailing and boating. These nature-based activities play an important part in maintaining physical, mental and emotional health.[69] In many situations, these activities and the personal benefits gained from them are among the most important values that people associate with nature.[70] Establishing MPAs can also benefit recreational users by offering aesthetic appreciation or opportunities for spiritual experiences and artistic inspiration.

Emerging research suggests MPAs can amplify positive benefits people gain from their interactions with nature. Visits to nature, especially those to protected areas and coastal environments, were associated with greater feelings of relaxation and refreshment, along with stronger emotional connections to the natural world.[71] Similar subjective well-being benefits have been found for recreational divers and anglers, including gains in place identity and therapeutic value.[72] And it is not just visitors who benefit – similar benefits have been observed in those involved in MPA management.[73]

MPAs act as "living laboratories"

MPAs are important reference points for studying how species and ecosystems respond to human activities (*e.g.*, commercial or recreational fishing, shipping, or oil and gas activities), and to climate change. MPAs provide areas with reduced human interference so researchers can compare conditions inside versus outside the MPA.[74]

Though not recognized as MPAs under Canadian law, in 2014 Indigenous nations in the Central Coast Indigenous Resource Alliance responded to a decline in Dungeness crab stocks by protecting selected areas and comparing crabs in open sites to the closed sites. The results showed that the closures significantly benefited the crab population: both the body size and the numbers of Dungeness crab increased at the closed sites, and the size and population of crabs decreased at the open sites.[75] This suggests that where commercial fishing occurs, decline in numbers and body size of Dungeness crab results – and was only possible due to the closures ordered and enforced

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[68] Pabon-Zamora L. *et al. Nature's value: Assessing protected area benefits* (The Nature Conservancy, 2008). **https://www.conservationgateway.org/Files/Documents/valuingnatureqg-web_Pabonetal2008.pdf**. Bequest values arise from wanting to preserve an ecosystem service for future generations – people both near and far from MPAs can feel better knowing that a particular species or habitat is being protected, or that a cultural or historic treasure is being preserved for future generations.: Loomis J.B., White D.S. *Ecol. Econ.* **18**, 197–206 (1996). **https://doi.org/10.1016/0921-8009(96)00029-8**; Second, existence value arises when individuals benefit from simply knowing that a species or habitat itself exists, even if they have never seen or visited an area. Lastly, option values arise from uncertainty about the future demand, or supply of, a good and service. MPAs elicit option values – they help ensure the option of having an ecosystem service in the future (like the provision of seafood or other harvestable resources), thus acting as an environmental insurance policy in turbulent times.

[69] Gladwell V.F., *et al. Extrem Physiol Med* **2**, 3 (2013). **https://doi.org/10.1186/2046-7648-2-3**

[70] Farmer A. *Ocean protection: why citizens' values matter* (Institute for European Environmental Policy, 2018). **https://ieep.eu/wp-content/uploads/2022/12/Think-2030-Ocean-values-1.pdf**

[71] ScienceDaily. *Are some natural environments more psychologically beneficial than others?* (2017). **https://www.sciencedaily.com/releases/2017/10/171031202451.htm**

[72] Bryce R. *et al. Ecosyst. Serv.* **21**, 258–269 (2016). **https://doi.org/10.1016/j.ecoser.2016.07.015**

[73] For example, Australian volunteers engaged in an MPA monitoring program reported enjoyment, personal satisfaction, and other positive mental and emotional health effects from contributing to conservation: Koss R.S., Kingsley J.Y. *Ocean Coast. Manag.* **53**, 447–453 (2010). **https://doi.org/10.1016/j.ocecoaman.2010.06.002**; In the Philippines, community members involved in MPA management identified a wide range of positive personal impacts, from a sense of pride to a greater motivation to safeguard fishing opportunities and aesthetic experiences for their children and grandchildren: Yasué M., *et al*. Aquat. Conserv. Mar. Freshw. Ecosyst. 32, 1057–1072 (2022). **https://doi.org/10.1002/aqc.3801**

[74] Babcock R.C. *et al. Proc. Natl Acad. Sci. USA* **107**, 18256–18261 (2010). **https://doi.org/10.1073/pnas.0908012107**; Halpern B.S., Lester S.E., McLeod K.L. *Proc. Natl Acad. Sci. USA* **107**, 18312–18317 (2010). **https://doi.org/10.1073/pnas.0908503107**

[75] Frid A., McGreer M., Stevenson A. *Glob. Ecol. Conserv.* **6**, 48–57 (2016). **https://doi.org/10.1016/j.gecco.2016.01.002**

under Indigenous law.

Marine protection can also benefit longer-term research. For example, California implemented a state-wide network of MPAs between 2004 and 2012, and long-term monitoring has shown that some species are already responding to protection with increases in size and abundance.[76] Researchers and managers of MPAs are using the results to adapt management and inform the design of other protected areas.

MPAs require planning and management

MPAs come in many forms and their outcomes vary widely, especially when protection is partial, young, or weakly enforced. For instance, reviews show that minimally protected areas often deliver little ecological gain compared with open areas, whereas fully/highly protected sites perform better.[77] Additionally, strong protection is politically popular: in a 2022 poll, the majority of Canadians polled did not support commercial and extractive activities in MPAs.[78]

Effective results also depend on management capacity (*i.e.*, staffing, budgets and monitoring); under-resourced MPAs can displace fishing effort or impose uneven social costs if equity is not planned for.[79] Benefits typically take time to accrue and can be undermined by climate-driven shifts unless management adapts at site and network scales.[80]

Criticisms of MPAs generally may actually be criticisms of the effectiveness of a specific MPA. Ultimately, whether MPAs deliver the benefits highlighted in this document depends on level of protection, age, size, enforcement, connectivity, local context, and management capacity—and on integrating MPAs with broader tools such as ecosystem-based fisheries management, marine spatial planning, climate adaptation, and Indigenous co-governance.[81] There are also instances in which studies are misinterpreted or misrepresented, or key limitations are not acknowledged.[82]

About West Coast Environmental Law

West Coast Environmental Law is one of the oldest and largest public interest environmental law organizations in Canada and is the only organization with a dedicated marine law program. Its lawyers are experts in environmental law and wrote a textbook on ocean conservation law that was published by UBC Press.[83]

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[76] For a synthesis: California's 2023 Decadal Management Review, released in 2023: **https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=209209&&inline**; For specific examples of observed benefits, see: Kumagai J.A. *et al. Glob. Change Biol.* **30**, e17620 (2024). **https://doi.org/10.1111/gcb.17620**; Perkins N.R. *et al. Conserv. Sci. Pract.* **6**, e13190 (2024). **https://doi.org/10.1111/csp2.13190**

[77] Turnbull J.W. *et al. Conserv. Biol.* **35**, 921–932 (2021). **https://doi.org/10.1111/cobi.13677**

[78] *SeaBlue Canada 2022*, see note 9, at PDF p 24.

[79] *Gill 2017*, see note 63.

[80] Pinsky M.L., *et al. Annu. Rev. Mar. Sci.* **12**, 153–179 (2020). **https://doi.org/10.1146/annurev-marine-010419-010916**

[81] The MPA Guide, a framework published in the journal *Science*, links these ingredients to expected ecological and social outcomes: Grorud-Colvert K. *et al. Science* **373**, eabf0861 (2021). **https://doi.org/10.1126/science.abf0861**

[82] For example, see: Boulcott P. *et al. Aquat. Conserv. Mar. Freshw. Ecosyst.* **28**, 840–849 (2018). **https://doi.org/10.1002/aqc.2903** –The MPA that is the focus of this study is widely viewed as a conservation success and has been used repeatedly to advocate from more MPAs in UK waters; Di Lorenzo M. *et al. Fish Fish.* **21**, 906–915 (2020). **https://doi.org/10.1111/faf.12469** – Provides clear evidence of MPAs' spillover effect but has been spun by critics of MPAs to say that spillover effects are confined to areas close to MPA boundaries (known as "fishing the line", which is actually an indicator that an MPA is effectively managed and well located to increase productivity). Hampton J. *et al. Front. Mar. Sci.* **9**, 1060943 (2023). **https://doi.org/10.3389/fmars.2022.1060943** – Has been misrepresented, while also pointing out key limitations of the study, including the fact that it is based purely on modeling, as described by Spencer Roberts, Blue Planet Society: *Disinformation swells against high seas marine reserves* (2023, Blue Planet Society). **https://blueplanetsociety.org/disinformation-swells-against-high-seas-marine-reserves/**

[83] *Hewson 2023*, see note 23.