

Recommendations for Canada's Blue Economy Strategy

We cannot sustainably increase productivity or prosperity without first recovering, rebuilding, and restoring ocean ecosystems. Like a diverse financial portfolio, biodiversity creates resilience and optimises returns. However, we have depleted our assets; fisheries and ecosystems are declining. We must rebuild our ocean bank account by making wise investments that protect nature and increase biodiversity so that our blue economy portfolio is secure, sustainable, and resilient in the face of climate change.

The good news is that we can do this and create good jobs and long-term economic benefits for coastal communities. Effective and well managed MPAs with adequate funding can produce financial returns of up to 10:1 on every dollar invested and conservation projects create more jobs per million dollars invested than most industrial sectors. On top of that, MPAs sustain healthy fisheries, support flourishing tourism and recreation sectors, provide natural ecosystem services from flood defence to water purification, and increase property values and taxes. Thus, MPAs themselves should be seen as opportunities for investment rather than limitation and an important pillar of a flourishing and resilient ocean economy.

With a significant and wise investment in MPAs that provides capacity for careful management and monitoring, Canada could create over 80,000 meaningful, permanent, full time jobs (many in coastal and indigenous communities) and see a financial return of more than \$46 billion including a thriving and sustainable fishing sector and rapidly growing tourism and conservation sector.

Effective monitoring and management of MPAs is needed to accurately account for long term benefits and impacts of MPAs. This data will not only support the effectiveness of MPAs but will inform broader decisions around ocean management. Strongly protected MPAs are widely recognized as one of the most valuable tools for providing baseline oceanographic and ecological information and can also improve governance providing valuable opportunities for increased stakeholder engagement and local stewardship and improving ocean literacy. **These long-term and indirect benefits and the costs of not protecting ecosystems need to be fully and clearly considered in Canada's Blue Economy Strategy, even when financial data is not available.**

Over the past five years, Canada has worked hard to position itself as a global leader in ocean conservation and sustainability. The development of a Blue Economy Strategy for Canada can support these efforts, but only if conservation, protection, and restoration are at its core, anything else will be unsustainable and ineffective. Canada's Blue Economy Strategy needs to integrate the national marine conservation targets not just as a foundational requirement for future sustainable growth, but also as an opportunity for investment and job creation.

Without Protection, a Blue Economy is not sustainable

With the longest coastline in the world and one of the largest ocean estates, Canada's Blue Economy already makes a significant contribution to the national economy. However, ocean ecosystems are already heavily exploited and severely damaged by human activities and climate change, resulting in habitat loss and a growing biodiversity crisis that will have wide reaching impacts for wildlife and people. Canada needs to rebuild and restore ocean health before it can start to plan how to grow the ocean economy. **A successful Blue Economy Strategy must first protect and restore healthy ecosystems, and then plan for sustainable, responsible, and equitable growth.**

As a member of the High-Level Panel for a Sustainable Ocean Economy (Ocean Panel) Canada has taken a leading role in establishing guiding principles to ensure a sustainable and equitable Blue Economy. In this spirit, Canada's own Blue Economy Strategy must not only reflect these principles but aim to set the international benchmark for sustainability. The Ocean Panel strongly emphasizes that healthy oceans are crucial to a sustainable ocean economy.¹ At present we have pushed the ocean well beyond its capacity to support us; protecting marine ecosystems and restoring ocean health is therefore a vital first step to reverse course. Accordingly, **the Ocean Panel recommended protecting 30% of the ocean in effective and strong Marine Protected Areas (MPAs).**

Canada has already made clear and strong commitments to protect 25% of its ocean by 2025, and 30% by 2030, and to establish minimum protection standards so that its MPAs are effectively protected. These commitments must be recognized as fundamental to a sustainable blue economy, and accordingly made a priority within Canada's Blue Economy Strategy. Failing to do so will undermine the recommendations of the Ocean Panel that ocean management and conservation must be integrated and reconciled.

The loss of biodiversity and habitats, declining fisheries, and impacts from climate change described by the Ocean Panel are as evident and as pressing in Canadian waters as they are elsewhere in the world. Annual audits of Canadian fisheries have documented steadily declining fisheries health since 2017.² Less than 30% of fish stocks are healthy and 17% are critical, and only 20% of those deemed critical have rebuilding plans in place.^{3,4} Many Species at Risk lack recovery plans and still face considerable threats. Desperate attempts to protect the few remaining North Atlantic right whales,⁵ beluga,⁶ and southern resident killer whales⁷ highlight the multiple and interacting pressures on these species. In the face of these declines and ongoing threats, protection and restoration must be at the core of Canada's Blue Economy Strategy. Without healthy ecosystems and thriving biodiversity there can be no "sustainable use" of marine resources – especially genetic resources.

- Investing in Protection is Investing in People

Although MPAs are sometimes viewed as potentially negative for communities because of limitations on human activities, a recent study co-authored by Canadian researchers found effective MPAs have more positive well-being outcomes for people than negative ones.⁸ In addition to better ocean accounting and a more comprehensive approach to evaluating impacts and benefits of protection, **there is also an urgent need and opportunity to transform the approach to MPA establishment to realize the opportunity to invest in communities.**

Studies estimate the return on investment from strongly protecting 30% of the ocean to be as much as 10:1, with significant economic benefits to the fishing and tourism sectors and have also highlighted the potential for the creation of thousands of sustainable and meaningful jobs in MPA planning, management, and monitoring.**Error! Bookmark not defined.**⁹ An evaluation of job creation on coastal and marine conservation projects in the USA found on average 17 jobs were created per million dollars invested which is higher than many conventional infrastructure projects and industries while reaping considerable additional benefits by supporting jobs in healthy fisheries, tourism and improving property values.¹⁰ The authors also note that the jobs created covered a broad range of skilled and unskilled work. In addition to direct benefits to tourism and fishing, there would be significant indirect benefits to marine industries such as boat building and mechanics, as well as associated goods and services in gateway communities. Surveys of MPA managers found that usually more than half of the operating budget was for staffing costs.¹¹

There are a range of estimations for management and establishment costs of MPAs as there several factors that can affect levels of needed and available funding including MPA size and location, developing versus developed nations, tourism and recreational use of sites, and phase of establishment. A 2004 global analysis of MPA management costs calculated the global median annual cost of MPA management as \$2,689 sq. km and a median annual cost of \$8,976 sq. km for developed nations (value shown in 2000 USD rate).¹²

Based on these numbers a 1,000 sq. km MPA with an annual operating budget between \$2.6 and \$8.9 million would create up to 150 jobs depending on budget and could potentially produce a return on investment of \$25 million or more. Protecting 30% of Canada's ocean would require an investment of between \$4 and \$15 billion, creating between 50,000 and 177,000 direct jobs and 25,000 – 86,000 indirect jobs. The return on investment could be more than \$40 billion (see Tables 1 & 2).

By approaching MPA planning as a long term investment with the creation of well-paid and culturally relevant jobs (both in government and elsewhere), with long term benefits for coastal economies, not only will opposition decrease but stewardship and compliance will also benefit.**Error! Bookmark not defined.** Underfunding and understaffing of MPAs is an issue globally and severely impacts MPA effectiveness; a 2017 analysis found that MPAs with adequate capacity produce ecological benefits 2.9 times greater than understaffed MPAs.¹³ In particular, investment and job creation could be targeted to

support Indigenous and remote, underserved communities, supporting Indigenous stewardship and Indigenous Guardian programs as well as youth employment programs. Well-managed MPAs, especially Indigenous Protected Areas, can provide real opportunities for Indigenous and coastal communities thus ensuring equitable prosperity.

According to surveys of MPA managers about typical Human Resource needs, **Error! Bookmark not defined.** protecting 30% of Canada's ocean could create up to 64,000 permanent administrative positions, 80,000 permanent field-staff positions, and 32,000 permanent science positions (see Table 2). This does not include indirect and induced jobs created in the local economy which could be as many as 86,000.

- Effective and Comprehensive Protection is Needed

Canada's commitment to protect 25% and 30% is consistent with the best available science and current international recommendations, including those of the Ocean Panel. Canada has also committed to implement minimum protection standards for MPAs to ensure that sites are effectively protected. A national network of strongly protected and effective MPAs covering 30% of the ocean, that not only meet but exceed the minimum standards, is a fundamental necessity for a sustainable Blue Economy Strategy. Furthermore, recent studies suggest that achieving this could restore ocean health within a few decades.¹⁴

Strongly protected and properly managed marine protected areas are one of the most effective conservation tools to help restore, rebuild and protect biodiversity and healthy oceans for the long term.¹⁵ The documented benefits of effective MPAs include 600% increase in fish biomass, and greater than 20% increase in biodiversity with cascading benefits for ecosystems when populations of large animals have been restored.¹⁶ Fully protected MPAs allow for the rebuilding of genetic variability and species age-structures that support increased productivity and resilience.¹⁷ However, MPAs require time to mature, sometimes taking a couple of decades to produce significant benefits. MPAs also need to be sufficiently large to ensure ecosystems are captured and adequately protected.¹⁸

For truly effective biodiversity protection, systematic MPA network planning ensures that representativity (of sites, habitats, and species) is captured and that ecological connectivity between habitats and species is restored and supported. Well-designed networks of effective MPAs, can also ensure that other benefits are secured including the protection and restoration of carbon rich ecosystems and natural infrastructure, enhanced climate resilience and adaptation, supporting fisheries by protecting key habitats for fisheries.

- Improve Ecological Accounting and Think Long Term

Undervaluing of marine ecosystem services was identified by both the High-Level Ocean Panel and the UK commissioned “The Economics of Biodiversity: The Dasgupta Review”¹⁹ as a critical challenge of our time. Both reports emphasize the key role of protected areas as an effective to conserve and restoring nature and recommend significant investment in and expansion of protected area networks. The need for a new “ocean accounting” is particularly evident in MPA design and establishment. As mentioned above, MPAs can provide a host of ecosystem services and indirect benefits to people. However, there is a paucity of data and so cost-benefit analyses for MPAs focus largely on short-term costs and direct benefits and fail to evaluate long term economic benefits or ecosystem services. Analyses and planning processes need to consider the costs or consequences of not protecting ecosystems as well as the long-term and indirect benefits of protection, so that stakeholders and decision-makers have the full picture and can make decisions based on long-term needs rather than short-term inconveniences.

To produce predicted benefits, the science clearly demonstrates that MPAs must be strongly protected, which can mean short to mid-term impacts for the fishing industry such as displacement or reduced effort. Carefully designed MPA networks and spatial support tools may be able to balance impacts and benefits, however attempting to avoid all or any impacts to industry can result in “residual reserves” that fail to protect any sites of real value and thus produce limited, if any, conservation or fisheries benefits.²⁰ Furthermore, some studies suggest that local impacts to fishers may not be as significant as first assumed²¹ and planning MPAs in remote areas away from communities and overfished areas can reduce the direct benefits of investment in conservation.

A recent global study²² tested protected area network scenarios to determine the effects of 30% fully protected, partially protected “compromise”, and business as usual (BAU) MPA scenarios on economic returns. The authors noted that with a current global decline in fisheries, BAU would see a slight reversal of decline in fisheries catch from 2030-2040, which they attribute to the benefits of existing protected areas, followed by continued decline post-2040. The fully protected 30% scenario would see a significant short-term decline in catch from 2030-2040 but then a rapid recovery with an increased catch 9x that in BAU. The compromise scenario showed that partially protected areas might provide a slight buffer to the short-term impacts to fisheries but will ultimately result in declining catches over the long term. Without strong protection in place, declines in fisheries catch will occur regardless. The authors also note that the nature sector is growing at a faster rate than fisheries (5-6% revenue growth cf. less than 1%) and the economic benefits to the nature and tourism sectors from a 30% fully protected scenario would significantly outweigh the short-term declines in fisheries. Even considering impacts of COVID on travel the authors predict significant continued growth.

To support improved ocean accounting, it is essential to invest in effective management and monitoring of MPAs so that changes in ecosystem health or biodiversity, ecosystem services, and direct impacts or benefits can be accurately and reliably measured. Lack of investment in management and monitoring of MPAs has been identified as a major reason for the failure of MPAs to produce expected benefits. Such

data will be invaluable in guiding the design and management of MPAs across Canada so that benefits to ecosystems and communities can be maximised.

- Valuing Indirect Benefits of MPAs

MPAs can also support climate change mitigation by protecting carbon rich ecosystems like kelp forests, eelgrass beds, salt marsh and estuaries. Some ecosystems like salt marshes in Atlantic Canada sequester high quantities of carbon with potential values calculated up to \$1bn for the salt marshes in the Bay of Fundy by 2022.²³ Even for those ecosystems with lower carbon concentrations or restoration potential, carbon emissions from loss and degradation of coastal marine ecosystems may still be significant.^{24 25} Carbon rich ecosystems also provide valuable disaster mitigation and climate resilience services by acting as natural flood and wave defence for coastal communities, and also act as vital nursery and feeding habitat for a host of marine species and commercially important fisheries. Healthy coasts and oceans support cultural and spiritual use, with tangible economic benefits like increased house prices and property taxes. At present there is not enough data to monetize the full extent of these benefits and services and so they are largely overlooked. Where we are not able to fully account for the benefits yet, we should be considering the potential impacts of lost ecosystems and acting in a precautionary manner.

Less easily quantifiable benefits of MPAs such as protection of natural infrastructure, reducing pollution, and non-economic cultural and recreational benefits such as access to marine areas and resources must not be overlooked in accounting for their value to communities. Other benefits include opportunities for research and increasing ocean literacy that will help provide a better and shared understanding of marine ecosystems that will support sustainable use of marine ecosystems. MPA establishment and management processes also support improved governance of marine resources including equitable and robust stakeholder engagement, and transparent decision making that will ensure that Canada's Blue Economy Strategy has broad support.

Table 1 - estimated investment, job creation and return on investment for individual MPAs based on size for (a) 1000 km² and (b) 5,000 km²

(a)

1,000 km ² MPA							
Scenario	CAD annual investment per Km2*	Investment CAD	Jobs**		ROI \$ ***		
			Direct	Total	1.4	2.7	10
Global Avg*	\$ 2,698.00	\$ 2,698,000	31	46	3,777,200	7,284,600	26,980,000
Developed Avg*	\$ 8,976.00	\$ 8,976,000	103	153	12,566,400	24,235,200	89,760,000
Size Based^^	\$ 770.00	\$ 770,000	9	13	1,078,000	2,079,000	7,700,000

(b)

5,000 km ² MPA ^							
Scenario	CAD annual investment per Km2*	Investment CAD	Jobs**		ROI \$ ***		
			Direct	Total	1.4	2.7	10
Global Avg*	\$ 2,698.00	\$ 13,490,000	154	229	18,886,000	36,423,000	134,900,000
Developed Avg*	\$ 8,976.00	\$ 44,880,000	514	63	62,832,000	121,176,000	448,800,000
Size Based^^	\$ 770.00	\$ 1,015,000	12	17	1,421,000	2,740,500	10,150,000

* from Balmford et al. 2004 - the median km²/yr investment for all MPAs globally vs MPAs belonging to developed nations

** from Edwards et al. 2013 - Direct jobs calculated at 11.45 jobs per million (Table 2), Total jobs includes indirect (industry trade) and induced jobs (local economy) is 17 jobs per million, this does not include tourism, fisheries or other industries that may benefit from protection

*** Return on Investment based on estimated values from Brander et al. (2015, 2020) and Duarte et al. (2020)

^ Investment for large MPAs calculated at 5,000km² as management costs are proportionally less for large MPAs (Balmford et al. 2004, Branden et al 2015)

^^ from Mcrea-Straub et al.

Table 2 - estimated investment, job creation and return on investment for National MPA coverage at (a) present level (14%) and (b) 30% (a)

14% protected (current status)							
Scenario	CAD annual investment per Km2*	Investment CAD	Jobs**		ROI \$ ***		
			Direct	Total	1.4	2.7	10
Global Avg*	\$ 2,698.00	\$ 2,171,890,000	24,868	36,922	3,040,646,000	5,864,103,000	21,718,900,000
Developed Avg*	\$ 8,976.00	\$ 7,225,680,000	82,734	122,837	10,115,952,000	19,509,336,000	72,256,800,000
Size Based^^		\$ 273,309,900	3,129	4,646	382,633,860	737,936,730	2,733,099,000

(b)

30% Protected							
Scenario	CAD annual investment per Km2*	Investment CAD	Jobs**		ROI \$ ***		
			Direct	Total	1.4	2.7	10
Global Avg*	\$ 2,698.00	\$ 4,654,050,000	53,289	79,119	6,515,670,000	12,565,935,000	46,540,500,000
Developed Avg*	\$ 8,976.00	\$ 15,483,600,000	177,287	263,221	21,677,040,000	41,805,720,000	154,836,000,000
Size Based^^		\$ 321,588,900	3,682	5,467	450,224,460	868,290,030	3,215,889,000

* from Balmford et al. 2004 - the median km²/yr investment for all MPAs globally vs MPAs belonging to developed nations

** from Edwards et al. 2013 - Direct jobs calculated at 11.45 jobs per million (Table 2), Total jobs includes indirect (industry trade) and induced jobs (local economy) is 17 jobs per million, this does not include tourism, fisheries or other industries that may benefit from protection

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^^ from Mcrea-Straub et al.

Table 3 – Breakdown of staffing needs by category (based on Binet et al. 2015, Edwards et al. 2013)

Global/ Developed	MPA Size/ Total Area	Direct Jobs				Indirect Jobs
		Total	Admin	Field	Science	
Global	1000km2	31	11	14	6	15
Global	5000km2 +	154	55	69	28	75
Global	14%	24,868	8,952	11,191	4,476	12,054
Global	30%	53,289	19,184	23,980	9,592	25,830
Developed	1000km2	103	37	46	19	50
Developed	5000km2 +	514	185	231	93	249
Developed	14%	82,734	29,784	37,230	14,892	40,103
Developed	30%	177,287	63,823	79,779	31,912	85,934

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