

Submission to the Commonwealth Marine Reserves Review

<http://www.environment.gov.au/marinereservesreview/home>

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Marine reserves are an important strategy for conserving biodiversity and ensuring resilient fisheries. The ecological benefits of marine reserves are extensively documented both internationally and in Australia¹. By prohibiting extractive uses, habitats and populations of targeted species can recover from damage and exploitation. Benefits range from improved species richness, greater fish biomass, and increased habitat complexity both inside and outside of reserves²⁻⁴. Reserves often demonstrate substantial financial returns from tourism related revenue streams, and provide enhanced opportunities for community education and recreational activities.

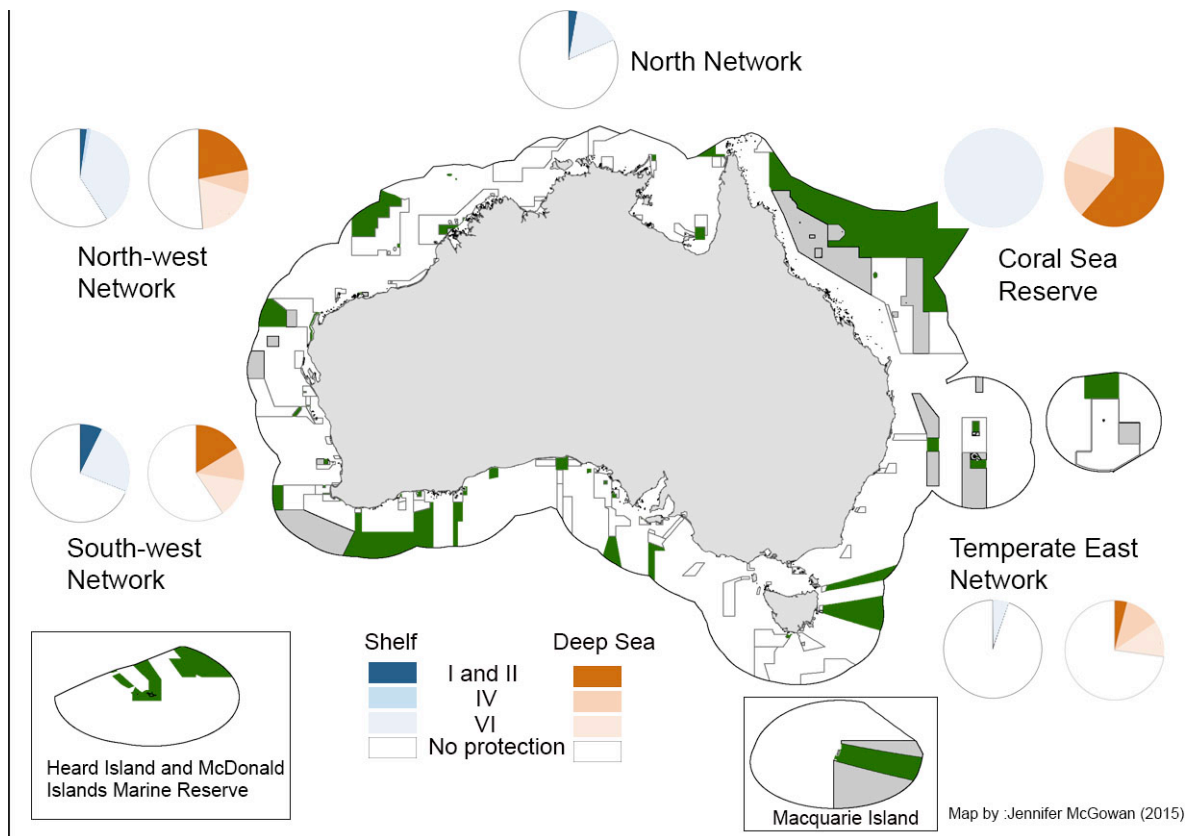


Figure 1. Proportions of shelf and deep sea habitats protected in IUCN categories I-VI across the five planning regions being considered under the Commonwealth Marine Reserves Review.

Australia, which is a signatory to the Convention on Biological Diversity (CBD), has committed to establish protected areas that will make a significant contribution to the Aichi near-term target - 10% of the global oceans in “effective and equitably managed, ecologically representative and well connected systems of protected area⁵” by the year 2020.

Representation is a fundamental concept in spatial conservation prioritization. A straightforward definition of representation is – to capture a portion of every biodiversity feature in a network of protected areas. Australia has committed to a representative marine and terrestrial reserve system in its own policies and as a signatory to international agreements – indeed Australia has been a champion for the scientific principle of representation in reserve system design for decades. Australia’s commitment to systematically designed and representative protected areas in the Great Barrier Reef set a precedent for the world. However, the current interpretation of this principle in the proposed commonwealth marine reserve system is not consistent with global best practice and Australia’s own written policies.

		Percentage of Bioregions (N=58)*		
		0% representation	0 <10% representation	≥ 10% representation
MPA IUCN Category	Ia and II	47	28	26
	Ia, II & IV	42	28	31
	Ia, II, IV & VI	10	12	78

Table 1. Percentage of bioregional representation under different MPA schemes. *Bioregions are defined as both the IMCRA mesoscale and provincial levels. The table covers the five planning regions being considered under the Commonwealth Marine Reserves Review.

With a network aiming to represent a 2.56 million km² EEZ, the current levels of representation are poor given that less than 3% of shelf habitats are protected by the strictest IUCN conservation categories (Ia and II) across the country. The deficiencies in the current design also reflect inequitable coverage across broad habitats and planning regions⁶ (Figure 1).

Australia’s four design goals suggest the establishment of a “representative marine reserve system in all marine regions⁷”. Yet, protected area coverage at the bioregional scale shows that even under the most liberal conservation scheme (all IUCN categories I through VI), twenty-two percent of bioregions⁸ fall short of 10% protection (Table 1), and 10% of the bioregions have no protection at all. Surprisingly, 27 of 58 bioregions have no strictly protected areas (IUCN I and II) according to the initial zoning plan. **Analysis at this planning scale shows that the current network boundaries and the initial zoning proposals are insufficient to meet representation goals without additional augmentation.**

While we recognise there is no scope to alter the outer boundaries of the broader network, there is an opportunity to better capture the diverse range of habitats in highly protected areas. By adopting a stratified approach to representation at the bioregional scale, both representation and replication can be systematically incorporated into the zoning process⁸. We strongly recommend that the government ensure every bioregion benefits from at least one strict nature reserve (IUCN Ia) or a national park (IUCN II). At present, the majority of unrepresented bioregions are the shelf areas in the Temperate East, North and North-west Networks (Figure 2). If we do not have strict nature reserves in every bioregion then it will not be possible to scientifically evaluate the costs and benefits of marine reserves for biodiversity and fisheries. Failure to take advantage of the opportunity to learn and adaptively manage marine environments is essential to evidence-based decision-making in the future.

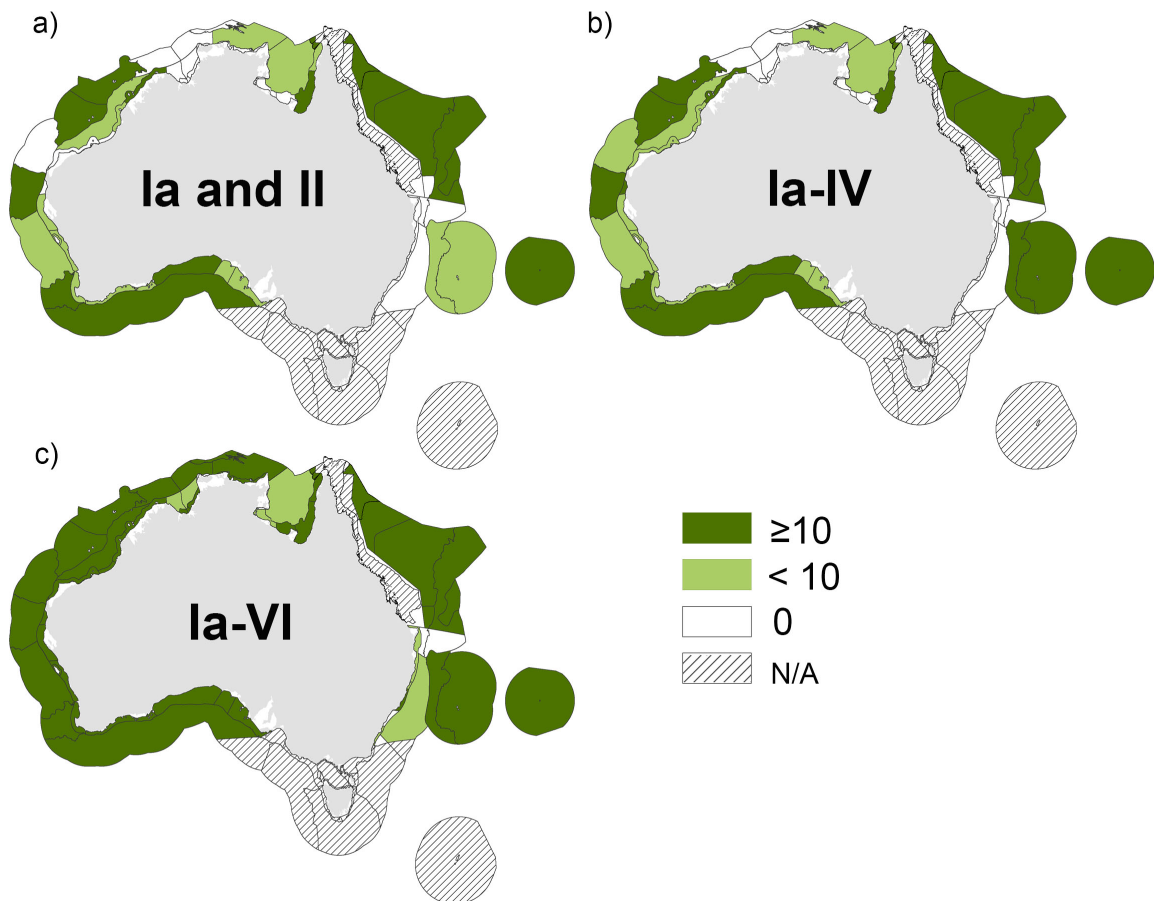


Figure 2. Bioregional representation under different MPA schemes: a) IUCN category Ia & II b) IUCN Ia, II & IV c) all categories of IUCN MPAs. Shaded bioregions were not considered in the analysis.

Implementing our recommendation for at least one strict reserve in every bioregion will: 1) bring Australia much closer to meeting its international commitments 2) provide more

equitable biodiversity and fisheries benefits 3) enable us to learn about the costs and benefits of marine reserves across the full range of marine environments in Australia.

References:

1 Halpern BS, Lester SE, Kellner JB (2009) Spillover from marine reserves and the replenishment of fished stocks. *Environmental Conservation* 36: 268-276.

2 McCook, L. J. *et al.* (2010) Adaptive Management Of The Great Barrier Reef: A Globally Significant Demonstration Of The Benefits Of Networks Of Marine Reserves. *Proceedings of the National Academy of Sciences* 107: 18278–85.

3 Russ, G. & Alcala, A. (2011) Enhanced Biodiversity Beyond Marine Reserve Boundaries: The Cup Spillover. *Ecological Applications* 21: 241-250. Available at <http://www.esajournals.org/doi/abs/10.1890/09-1197.1>

4 Roberts, C. (2012) Marine Ecology: Reserves Do Have A Key Role In Fisheries. *Current Biology* 22: R444–6.

5 Convention on Biological Diversity. “Aichi Biodiversity Targets” Available at <http://www.cbd.int/sp/targets>

6 Barr, L. M., and Possingham, H. P. 2013. Are outcomes matching policy commitments in Australian marine conservation planning?. *Marine Policy* 42: 39-48.

7 Department of Environment, Australian Government. Goals and Principles. Commonwealth marine reserves review. Available at <http://www.environment.gov.au/marinereservesreview/goals-principles>

8 The Ecology Centre, The University of Queensland (2009) Scientific Principles for Design of Marine Protected Areas in Australia: A Guidance Statement. 29pp. Available at <http://www.uq.edu.au/ecology/index.html?page=102441&pid=108450>