
THE NORTH MARINE RESERVE
NETWORK:

CENTRE FOR CONSERVATION
GEOGRAPHY REPORT TO THE
AUSTRALIAN GOVERNMENT'S MARINE
RESERVES REVIEW

VERSION 1.0

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Report prepared by Daniel Beaver, Joel Turner, Thomas Keily and Lucinda Douglass

This report is an independent research paper commissioned by the Save Our Marine Life Alliance.



**CENTRE FOR
CONSERVATION
GEOGRAPHY**

Strategic Tools and Conservation Innovation

ABOUT THE AUTHORS

CENTRE FOR CONSERVATION GEOGRAPHY

The Centre for Conservation Geography is a research group established to provide expert technical support and advice to Government and non-Government decision makers and stakeholders. The centre's focus is to apply world's best practice in decision support to planning for biodiversity conservation and Indigenous land management. Based in Australia, our goal is to build a multi-disciplinary team capable of providing support to decisions being made across the world's ecoregions.

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KEY FINDINGS

In reviewing the available data on the North Marine Reserve Network the Centre for Conservation Geography makes five key findings relating to a review of the zoning plans for the North Marine Reserves (the North Marine Reserve Network and its zoning was passed into law by the Abbott Government in December 2013¹):

1. **Marine National Park Zones:** Are critical to the protection of the North Marine Region's marine life with the weight of scientific evidence showing that partially protected zones don't deliver the broad ranging and significant benefits for marine life of highly protected zones. The Centre for Conservation Geography recommends expanding the number and size of Marine National Park Zones in the North Marine Reserve Network.
2. **Social and economic impacts:** The information compiled by the Centre for Conservation Geography shows that the net social and economic value of the North Marine Reserve Network to the Australian community is upwards of \$200 million. Within this positive impacts on nature based tourism, recreational fishing, Indigenous employment and regional employment are expected to outweigh any possible negative impacts on commercial fishing. Community support for the marine reserves is very strong with over 99% of the more than 10,000 submissions to the public consultation process supportive of increased protection for the North Marine Region. The zoning plan could be improved so as to enhance the positive social and economic impacts by providing increased protection to areas within, adjacent or near to Indigenous sea country and by extending the area protected from destructive fishing practices like pelagic gillnetting and longlining.
3. **Destructive fishing practices:** The Government's risk assessment process found five commercial fishing practices to be incompatible with the conservation values of the North Marine Reserve Network. The zoning plan should be adjusted to ensure that these five fishing practices are fully removed from the North Marine Reserve Network.
4. **Seabed mining:** The North Marine Reserve Network leaves 97% of the North Marine Region open to seabed mining including high conservation locations like around Groote Eylandt and Limmen Bight. Australians do not want to see mining across such large swathes of our oceans. The zoning plan for the North Marine Reserve Network needs to play a more significant role in helping to find a better balance between mining and the other values of the ocean.
5. **Unprotected habitats:** Major concerns exist within the scientific community about the low level of protection for the unique habitats of the shelf and upper slope environments of the North Marine Region. Habitats with low, or no protection within Marine National Park Zones include entire marine bioregions, as well as key ecological features and biologically important areas for iconic species like sea turtles and seabirds. The review should consider increasing the protection for these features.

¹ Commonwealth of Australia, 2013. *Environment Protection and Biodiversity Conservation (Commonwealth Marine Reserves) Proclamation 2013*
<<http://www.comlaw.gov.au/Details/F2013L02108>>

INTRODUCTION

On the 11th of September, 2014 the Australian Government announced a review of the North Marine Reserve Network (Figure 1). In the announcement of the review the Government stated that it desired to get the balance of zoning right and to work out what system of zoning would “best protect our marine environment and accommodate the many activities that Australians love to enjoy in our oceans.”² The Government further stated that: “Our aim is to have a sensible balance, which protects the environment, supports a sustainable fishing industry, attracts tourism and provides cultural, recreational and economic benefits for coastal communities.”²

This report takes the form of a brief submission to the expert scientific panel and the bioregional advisory panel on the North Marine Reserve Network established by the Government's terms of reference for the marine reserves review.³ The report aims to briefly address each of the items on which the Government has requested the panels to report. If either of the two panels desire more in depth information from the Centre for Conservation Geography (CCG), the centre is open to providing further assistance to the panels.

This report represents the independent scientific opinion of the researchers at the Centre for Conservation Geography. The report was commissioned by the Save Our Marine Life Alliance <<http://www.saveourmarinelife.org.au/>> as an input to the Australian Government's marine reserves review.

REPORT STRUCTURE

This report is structured to address directly and briefly the items on which the expert scientific panel and the bioregional advisory panel for the North Marine Reserve Network have been asked to report on outlined by the terms of reference for the marine reserves review.³ For the bioregional advisory panel these are:

1. Advice on areas of contention with the marine reserves.
2. Advice on options for zoning boundaries to address those areas of contention.
3. Recommendations for improving the inclusion of social and economic considerations into decision-making for marine reserves, with particular regard for their management.
4. Suggestions for ongoing engagement of regional stakeholders.

While the expert scientific panel has been asked to advise on:

5. Options for zoning, and zoning boundaries, and allowed uses consistent with the Goals and Principles.
6. Future priorities for scientific research and monitoring relating to marine biodiversity within the marine reserves, especially any relating to the understanding of threats to marine biodiversity within the marine reserves.
7. Options for addressing, the most significant information gaps hindering robust, evidence based decision-making for the management of the marine reserves.

² Hunt, G., and Colbeck, R., 2014. *Review of Commonwealth marine reserves begins*, Joint media release <<http://www.environment.gov.au/minister/hunt/2014/mr20140911a.html>>

³ Commonwealth of Australia, 2014, *Marine Reserves Review – Terms of Reference*, <<http://www.environment.gov.au/system/files/pages/931ca952-fdd2-4e14-a512-0a5278d22c71/files/commonwealth-marine-reserves-review-terms-reference.pdf>>

This report aims to provide useful input towards meeting the Government's objective of "maximising marine biodiversity protection while also minimising the social and economic impact."⁴

MAXIMISING MARINE BIODIVERSITY PROTECTION

The Marine Reserve Network for the North proclaimed by the Coalition Government in December 2013 maximises the protection of marine life by:

- 1. Establishing the first protection for the Gulf of Carpentaria, West Cape York and the Torres Strait:** The West Cape York Marine National Park Zone establishes the first ever protection within Marine National Park Zones for the unique marine life of the Torres Strait, West Cape York and Carpentaria bioregions.⁵ This includes the first ever protection within Marine National Park Zones for the inter-nesting habitats of the world's largest Flatback Turtle nesting population at Crab Island as well as the inter-nesting habitats of critically endangered Hawksbill Turtles, vulnerable Olive Ridley turtles and biologically important areas for Coastal Dolphins (Figure 1).⁶
- 2. Establishing the first protection for the Wellesley Islands:** The Wellesley Islands are a major hotspot for marine life, including abundant seagrass habitats and globally significant seabird nesting sites.⁷ The Gulf of Carpentaria Marine National Park Zone establishes the first ever protection within Marine National Park Zones for the waters surrounding the Wellesley Islands. This includes the first ever Marine National Park Zones for the unique marine life of the Wellesley and Karumba-Nassau bioregions (Figure 1).⁵
- 3. Establishing the first protection for the Wessel Islands:** The Wessel Islands are a hotspot for marine life containing a high number of species that occur nowhere else on earth (Figure 1).⁷ The Wessel Marine National Park Zone establishes the first ever protection within Marine National Park Zones for both the waters surrounding the Wessel Islands and for the unique marine life of the Arafura bioregion.⁵

⁴ Coalition, 2013. *The Coalition's policy for a more competitive and sustainable fisheries sector*, August 2013 <<http://lpaweb-static.s3.amazonaws.com/13-08-26%20The%20Coalition%E2%80%99s%20Policy%20for%20a%20More%20Competitive%20and%20Sustainable%20Fisheries%20Sector%20-%20policy%20document.pdf>>

⁵ Commonwealth of Australia (2006). *A Guide to the Integrated Marine and Coastal Regionalisation of Australia Version 4.0*. Department of the Environment and Heritage, Canberra, Australia.

⁶ Commonwealth of Australia, 2014. *Biologically important areas of regionally significant marine species*, <<http://www.environment.gov.au/fed/catalog/search/resource/details.page?uuid={2ed86f5a-4598-4ae9-924f-ac821c701003}>>

⁷ Commonwealth of Australia, 2008. *The North Marine Bioregional Plan: Bioregional Profile*, Department of the Environment, Water, Heritage and the Arts, Canberra, ACT, Australia.

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4. **Protecting a diversity of marine habitats:** The North Marine Region contains one of the world's last large relatively intact tropical shelf ecosystems.⁸ The North Marine Reserve Network increases the level of Marine National Park Zones within the Commonwealth waters of the North Marine Region from 0% up to 3% with all of the Marine National Park Zones established over shelf habitats. These Marine National Park Zones include 19 of the 239 unique seafloor environments mapped by the Centre for Conservation Geography within the North Marine Region. For 9 of these unique seafloor environments the North Marine Reserve Network meets the minimum Australian science community benchmarks for protection.⁹
 5. **Protection from destructive fishing practices:** The North Marine Reserve Network protects 18% of the North Marine Region from trawling, demersal longlining and gillnetting. The North Marine Reserve Network contains three Special Purpose Zones which allow set mesh nets (demersal gillnets) and pelagic gillnetting against the advice of the Government's fishing gear risk assessment (Figure 4).¹⁰
 6. **Protection from oil, gas and mining:** The North Marine Reserve network protects 3% of the North Marine Region from oil, gas and other mining activities including parts of West Cape York, the Torres Strait, the Gulf of Carpentaria and parts of the waters around the Wellesley and Wessel Islands. (Figure 2, Figure 3).

⁸ Halpern BS, Walbridge S, Selkoe KA, Kappel CV, Micheli F, D'Agrosa C, Bruno JF, Casey KS, Ebert C, Fox HE, Fujita R, Heinemann D, Lenihan HS, Madin EMP, Perry MT, Selig ER, Spalding M, Steneck R, Watson R (2008) A global map of human impact on marine ecosystems. *Science*, **319**(5865), 948.

⁹ The Ecology Centre, University of Queensland (2009) Scientific Principles for Design of Marine Protected Areas in Australia: A Guidance Statement. 29pp.
<http://www.uq.edu.au/ecology/docs/Scientific_Principles_MPAs.pdf>

¹⁰ Mary Lack Shellack Pty Ltd, 2010. *Assessment of risks that commercial fishing methods may pose to conservation values identified in the Areas for Further Assessment of the North and North-west Marine Regions*, Prepared for the Department of the Environment, Water, Heritage and the Arts, Canberra, ACT, Australia.

North Marine Reserve Network

Zoning plan proclaimed in December 2013

- Marine National Park Zone
- Special Purpose Zones
- Multiple Use Zone

North Marine Region

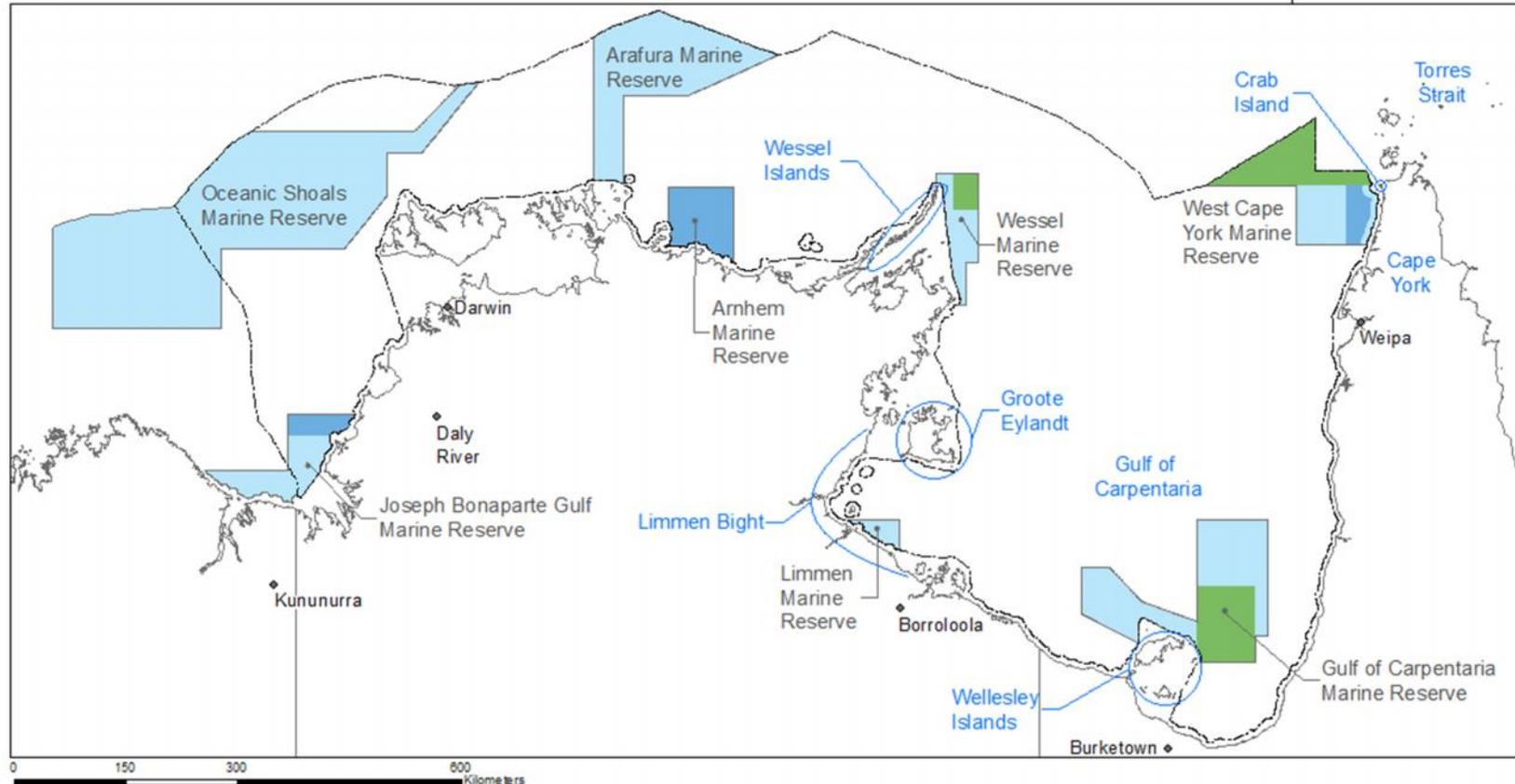


FIGURE 1: THE NORTH MARINE RESERVE NETWORK PROCLAIMED BY THE FEDERAL LABOR GOVERNMENT IN 2012 AND BY THE FEDERAL COALITION GOVERNMENT IN 2013.

SOCIAL AND ECONOMIC IMPACTS

The information compiled by the Centre for Conservation Geography and presented below shows that the net social and economic value of the North Marine Reserve Network to the Australian community is more than \$200 million. Within this, positive impacts on nature based tourism, recreational fishing, Indigenous employment and regional employment are expected to outweigh possible negative impacts on commercial fishing. This is made possible by the zoning plan for the North Marine Reserve Network proclaimed by the Coalition Government in December 2013, which successfully minimises potential negative social and economic impacts while maximising potential positive social and economic impacts:

1. **Benefits to communities and industries:** The economies and communities of the North stand to reap substantial benefits from the North Marine Reserve Network.
 - a. **Healthy marine life:** The Northern Territory and Western Cape York contain many coastal communities with strong connections to and a deep love for their marine environment. This can be seen in the popularity of the establishment of the new marine reserves. Of the more than 10,000 submissions to the public consultation process for the North Marine Reserve Network over 99% of submissions called for more not less Marine National Park Zones.¹¹ One of the most common methods for assessing non-market economic and social benefits to communities is to use surveys to assess a community's willingness to pay for some future environmental change.¹² For example, in a recent choice modelling study McCartney (2009)¹³ estimates an average willingness to pay of \$140 per annum for a modest set of environmental outcomes for the Ningaloo Marine Park. No equivalent modelling exercise exists for Australia's oceans in their entirety but if used as a lower bound and extended across Australia's marine regions then the community valuation of the social benefit of protecting the North Marine Region are in the order of \$130 million per annum per annum to the local communities of the North Marine Region.¹⁴
 - b. **Tourism:** The tourism industry of the Northern Territory is worth over \$1.6 billion per annum.¹⁵ With some of the most intact coastal tropical environments

¹¹ Commonwealth of Australia, 2012. *Marine Bioregional Planning in the North-west marine region: Overview of Public Consultation (August-November 2011)*, Department of Sustainability, Environment, Water, Population and Communities, Commonwealth Government, Canberra, Australia.

¹² Borger, T., Hattam, C., Burdon, D., Atkins, J.P., and Austen, M.C., 2014. Valuing conservation benefits of an offshore marine protected area, *Ecological Economics*, Vol. 108: 229-241.

¹³ McCartney, A., 2009. *The Policy Relevance of Choice Modelling: An Application to the Ningaloo and Proposed Capes Marine Parks*. Research Paper, School of Agricultural and Resource Economics, University of Western Australia. Not seen. Referenced in: The Allen Consulting Group, 2009. *The economics of marine protected areas*, The Allen Consulting Group, Melbourne, Victoria.

¹⁴ The Allen Consulting Group, 2009. *The economics of marine protected areas*, The Allen Consulting Group, Melbourne, Victoria.

¹⁵ Tourism NT, 2013. *Economic contribution of tourism to the Northern Territory 2012-2013*, <http://www.tourismnt.com.au/~media/files/corporate/research/nt-tourism-satellite-account-2012-13_northern-territory_australia.ashx>

in the world the tourism brand of the North Marine Region is inextricably linked with nature on a grand scale. A healthy and abundant marine life is a key part of the narrative that draws visitors to the region. The North Marine Reserve Network, particularly its Marine National Park Zones are a piece of critical regional economic infrastructure for maintaining and growing this \$1.6 billion dollar a year industry. Their role in protecting marine life and providing opportunities to market the health of Australia's oceans is critical to attracting visitors not just to the North Marine Region but to Australia as a global destination for nature based tourism.¹⁶

- c. **Environmental services:** Australia's oceans also provide services that are not always accounted for in the national economy. In 2011 the Centre for Policy Development estimated that unaccounted services to the Australian economy from our oceans exceeded \$25 billion per annum.¹⁷ Within this the North Marine Reserve Network is estimated to provide environmental services of greater than \$0.5 billion per annum with the Marine National Park Zones in particular having a value of more than \$70 million per annum.
 - d. **Fishery benefits:** Marine reserves have potential positive as well as potential negative impacts on recreational and commercial fisheries. Unfortunately, the Government's impact assessment process has focussed only on potential negative impacts and the potential positive benefits like more stable catches, or insurance against stock depletion have not been estimated for the North Marine Reserve Network.
2. **Oil, Gas and Mining:** The North Marine Reserve Network has no impact on the Oil and Gas industry. This has been achieved by having 0% overlap between marine reserves and oil and gas production, or retention leases and 0% overlap between Marine National Park Zones and any current oil and gas lease of any kind.
 3. **Recreational fishing:** The North Marine Reserve Network has no negative impacts on recreational fishers with Marine National Park Zones established exclusively outside of the areas utilised by recreational fishers.¹⁸ The potential negative impact of recreational fishing on the marine life of the North Marine Region is now openly acknowledged by recreational fishers with over 80% of the members of the Amateur Fisherman's Association of the Northern Territory (AFANT) supporting the NT Government's proposed closures in Darwin Harbour. The Centre for Conservation Geography considers that the North Marine Reserve Network will have a net positive impact on recreational fishing in the North Marine Region.
 4. **Commercial fishing:** The North Marine Reserve Network is very effective at minimising the displacement of commercial fishing activities. The North Marine Reserve Network extends over 20% of the North Marine Region but displaces only 2.4% of the

¹⁶ Prideaux, B., 2012. *Tourism Potential of the Proposed Coral Sea Commonwealth Marine Reserve*, Report to the Coral Sea Campaign by Professor Bruce Prideaux, Cairns, Queensland, Australia.

¹⁷ Eadie, L., and Hoisington, C., 2011. *Stocking Up: Securing our marine economy*, Centre for Policy Development, Sydney, New South Wales, Australia.

¹⁸ Amateur Fisherman's Association of the Northern Territory Inc., 2011. Submission to the Draft Commonwealth Marine Reserve Network Proposal for the North Marine Region.

commercial fisheries active in the region.¹⁹ Some commercial fishers are claiming that the marine reserves will have too great of an impact on their businesses.²⁰ However this does not appear to be true with the maximum potential displacement of commercial fishers within the North Marine Region less than 5% for all commercial fisheries operating in the region.¹⁹ Only one fishery in the North, the Gulf of Carpentaria Line Fishery has a displacement of greater than 3% of the annual value of their catch.¹⁹

- a) **Gulf of Carpentaria Line Fishery** Between 2009 and 2012 40% of the active license holders left the fishery.²¹ This has created an average increase in gross income per license holder of \$35,000. By contrast the potential negative impact of the North Marine Reserve Network is less than \$5,000 per annum. Even this minimal potential negative impact is not likely to be realised as the main target species (Spanish Mackerel makes up over 95% of catch) is a mobile pelagic species. While fisherman will no longer be able to catch Spanish mackerel within Marine National Park Zones these zones make up such a small proportion of the fishery that the impact on catch is likely to be zero as fishers continue to catch the same number of fish as the Spanish Mackerel move in and out of the Marine National Park Zones.
- b) **Destructive Fishing Practices:** Against the advice of its risk assessment the Government decided to reduce the impact on gillnetters (also referred to as mesh nets) in the North Marine region by creating three Special Purpose Zones where this fishing technique continues to be allowed. This reduced the potential negative impact on the Queensland gillnet fishery from 2.5% to 0.1%.¹⁹ The reduction in impact on the Northern Territory gillnet fishery is confidential due to the small number of operators but is expected to be comparable.

FORGOTTEN SOCIAL BENEFITS

An aspect which has received relatively little attention within debates around marine protection, yet which is emerging as critical, is the role marine national park zones can pay in enhancing what may broadly be termed social wellbeing. Social wellbeing incorporates a wide range of benefits communities experience through the presence of healthy natural environments, through their interactions and connections with these areas, and through the collective process of stewardship.

Recent research from within the emerging disciplines of eco-health research and disease ecology reveal for example that effective protection of the environment can contribute to improved human health outcomes, including related to both mental and physical wellbeing, and also enhancing social cohesion among citizens. In addition to the obvious benefits of provision

¹⁹ Commonwealth of Australia, 2012. *Completing the Commonwealth marine reserves network: Regulatory impact statement*, Department of Sustainability, Environment, Water, Population and Communities, Canberra, ACT, Australia.

²⁰ National Seafood Industry Alliance, 2014. *North: meet the fishers*, <http://www.seafoodforaustralia.com.au/meet_the_fishers/north_fishers.phtml>

²¹ Queensland Government, 2013. *Gulf of Carpentaria Line Fishery: 2012 fishing year report*, Department of Agriculture, Fisheries and Forestry, Brisbane, QLD, Australia.

of clean air, water and other resources, this is perhaps most compellingly shown in research demonstrating that the drivers of environmental change and subsequent declines in biodiversity also drive the emergence of infectious diseases, which impact "by disrupting "natural" host-pathogen dynamics and/or by exposing humans to a novel pool of pathogens from wildlife reservoirs'.²²

Social wellbeing also relates to the positive benefits of interacting with the natural environment, such as improved fitness and physical health, higher perceptions of wellbeing and quality of life, and better overall mental health and wellbeing among groups regularly interacting with natural areas.^{23, 24, 25, 26} Observation of the effects of environmental degradation on communities also reveals the sense of security derived from adequate protection of natural environments, with higher levels of stress, anxiety, depression and social conflict occurring in communities experiencing high levels of environmental change and degradation.^{27, 28, 29, 30}

These findings also point to intangible aspects of wellbeing related to the long-term protection of Australia's marine environment. Given the central role healthy oceans and beaches play in an iconic Australian way of life, the important role marine national park zones can play in ensuring the long term survival of this uniquely Australian culture and identity deserves attention. Connections between conservation and present day cultural expression and social identity have been most explicitly explored in Australia in research literature on Indigenous communities - in this context protecting marine and aquatic ecosystems is a key aspect in fulfilling many Indigenous community aspirations for active stewardship and connections with their traditional country- and this is an expression of a unique and highly cherished cultural identity and way of life.³¹

²² Olival et al. (2013) 'Linking the Historical Roots of Environmental Conservation with Human and Wildlife Health' *Ecohealth* 10: 224-227

²³ Maller, C., M. Townsend, L. St Leger, C. Henderson-Wilson, A. Pryor, L. Prosser and M. Moore (2009). "Healthy parks healthy people: The health benefits of contact with nature in a park context."

²⁴ Bratman, G. N., J. P. Hamilton and G. C. Daily (2012). "The impacts of nature experience on human cognitive function and mental health." *Annals of the New York Academy of Sciences* **1249**(1): 118-136.

²⁵ Husk, K., R. Lovell, C. Cooper and R. Garside (2013). "Participation in environmental enhancement and conservation activities for health and well-being in adults." *The Cochrane Library*.

²⁶ Johnston, F. H., Jacups, S. P., Vickery, A. J., & Bowman, D. M. (2007). Ecohealth and Aboriginal testimony of the nexus between human health and place. *EcoHealth*, 4(4), 489-499.

²⁷ Warsini, S., J. Mills and K. Usher (2014). "Solastalgia: living with the environmental damage caused by natural disasters." *Prehospital and disaster medicine* **29**(01): 87-90.

²⁸ Albrecht, G., G.-M. Sartore, L. Connor, N. Higginbotham, S. Freeman, B. Kelly, H. Stain, A. Tonna and G. Pollard (2007). "Solastalgia: The distress caused by environmental change." *Australasian Psychiatry* **15**(S1): S95-S98.

²⁹ Speldewinde, P. C., A. Cook, P. Davies and P. Weinstein (2009). "A relationship between environmental degradation and mental health in rural Western Australia." *Health & Place* **15**(3): 880-887.

³⁰ McNamara and Westoby (2011) 'Solastalgia and the Gendered Nature of Climate Change' *Ecohealth* 8: 233-236

³¹ see eg Dhimurru (2006) Dhimurru Yolngu Monuk Gapu Wānga Sea Country Plan: A Yolngu Vision and Plan for Sea Country Management in North-East Arnhem Land, Northern Territory Dhimurru Land Management Aboriginal Corporation;

This under-explored theme is also highly relevant to discussions relating to mainstream Australian society and marine reserves. The broad support for long established marine reserves that exists among a range of user groups, including recreational fishers,^{32, 33, 34, 35, 36} and the maintenance of high usage, and in some cases increases in visitation,^{34, 37, 38, 39, 40} of areas following the establishment of marine reserves, suggest that marine reserves are already helping to maintain, rather than erode, the Australian coastal way of life. Marine reserves then are already an important part of the social fabric of Australia, protecting our iconic and much cherished way of life by protecting the integrity of the places and environments that make it possible. This contribution should not be underestimated when considering the long-term wellbeing of Australian society.

³²McGregor Tan research (2008), Solitary Islands Marine Park Community Survey Final Report, Prepared for: NSW Marine Parks Authority Project No: 8353

³³ McGregor Tan research (2008), Jervis Bay Marine Park Community Survey Final Report, Prepared for: NSW Marine Parks Authority Project No: 8353

³⁴ NSW Marine Parks Authority, 2010, Lord Howe Island Marine Park Summary of Research and Monitoring. NSW Government, Sydney.

³⁵ See also comments from Fishing Australia presenter Rob Paxevanos discussing the value of marine sanctuaries and support for them from the fishing community - Fishing Australia 28th November 2014.

³⁶ Sparks, M and Munro M. 2011. Fisheries Research and Development Corporation Recreational Fishing Survey. Intuitive Solutions, Docklands, Victoria.

³⁷ Smallwood, C. B., & Beckley, L. E. (2012). Spatial distribution and zoning compliance of recreational fishing in Ningaloo Marine Park, north-western Australia. *Fisheries Research*, 125, 40-50.

³⁸ Sutton, S. G. and R. C. Tobin 2009 "Recreational fishers' attitudes towards the 2004 rezoning of the Great Barrier Reef Marine Park." *Environmental Conservation* 36(03): 245-252.

³⁹ Northcote, J and McBeth, J. 2008 Socio-economic Impacts of Sanctuary Zone Changes in Ningaloo Marine Park: A preliminary investigation of effects on visitation patterns and human usage. CRC for Sustainable Tourism, Brisbane.

⁴⁰ Beckley, L. E., Smallwood, C. B., Moore, S. A., & Kobryn, H. T. (2010). Ningaloo collaboration cluster: human use of Ningaloo Marine Park (No. 2, p. 166). Ningaloo Collaboration Cluster Final Report

1. AREAS OF CONTENTION IN THE NORTH MARINE RESERVE NETWORK

1A. MARINE NATIONAL PARK ZONES

Marine National Park Zones are critical to the protection of marine life.^{41,42,9,52,43} All other zones, including recreational fishing zones, or those that include vertical zoning⁴⁴ like benthic protection zones only offer partial protection⁴⁵ and are designed either to achieve particular social, or economic outcomes, or to act as buffers to the Marine National Park Zones which play the fundamental role in conserving marine life and increasing the health of the ocean.

The majority of recreational fishers are supportive of Marine National Park Zones to protect marine life.⁴⁶ However there is a hopeful belief amongst a small proportion of recreational fishers that their activities have little or no impact on marine life and that marine life can be effectively protected with no restrictions on recreational fishing. Unfortunately, this is not true. The scientific evidence is now clear that zones which allow recreational fishing do not protect

⁴¹ Australian Marine Science Association, 2011. Submission to the Draft Commonwealth Marine Reserve Network Proposal for the North Marine Region.

⁴² Possingham, 2011. *Developing Australia's national system of marine reserves: A statement of concern about the proposal for Australia's South West Marine Region*, Submission to the Draft Commonwealth Marine Reserve Network Proposal for the South-west Marine Region.

⁴³ Lester SE, Halpern BS, Grorud-Colvert K, Lubchenco J, Ruttenberg BI, et al. (2009) Biological effects within no-take marine reserves: a global synthesis. *Marine Ecology Progress Series* 384: 33–46.

⁴⁴ Under current IUCN guidelines any zone containing vertical zoning is considered to have the level of protection of the least protected zone.⁴⁵

⁴⁵ Dudley, N., 2008. *Guidelines for Applying Protected Area Management Categories*, International Union for the Conservation of Nature (IUCN), Gland, Switzerland.

⁴⁶ Galaxy Research, 2014. *Community Attitude Survey*. Prepared for Dive Industry Association of Australia.

marine life as effectively Marine National Park Zones do.^{47,48,49,50,51,52,53} This is because it is not unusual for recreational fishing catch to exceed commercial fishing catch.⁵⁴ Recreational fishing also has the capacity to cause trophic cascades through the removal of older individuals in a population, or through the removal of top order predators.⁵⁴

Equally, commercial fishers often argue against Marine National Park Zones to avoid changes in where they are and are not allowed to fish. There is a belief amongst some commercial fishers that when fisheries management is good enough, Marine National Park Zones will not be required.⁵⁵ Unfortunately, this is not true. While Marine National Park Zones have both positive and negative impacts on fisheries in Australia they are rarely established to achieve fisheries management objectives. Rather Marine National Park Zones in Australia are put in place to protect marine life, improve the health of our oceans and to achieve the social, scientific and economic benefits that flow from their establishment. Just as best practice logging is an illogical argument against the communities desire for some forests to be in National Parks, the Australian communities desire for⁵⁶ and the long standing community consensus⁵⁷ that some

⁴⁷ Babcock, R., C., Phillips, J., C., Lourey, M., and Clapin, G., 2007. Increased density, biomass and egg production in an unfished population of Western Rock Lobster (*Panulirus cygnus*) at Rottneest Island, Western Australia, *Marine and Freshwater Research*, Vol: 58, p. 286-292.

⁴⁸ Sheers NT, Grace RV, Usmar NR, Kerr V, Babcock RC (2006) Long term trends in lobster populations in a partially protected vs. no-take marine park, *Biological Conservation*, 132, 222-231.

⁴⁹ Frisch AJ, Cole AJ, Hobbs J-PA, Rizzari JR, Munkres KP (2012) Effects of Spearfishing on Reef Fish Populations in a Multi-Use Conservation Area. *PLoS ONE* 7(12): e51938. doi:10.1371/journal.pone.0051938

⁵⁰ Sciberras M, Jenkins S, Kaiser M, Hawkins S, Pullin A (2013) Evaluating the biological effectiveness of fully and partially protected marine areas. *Environmental Evidence* 2: 4.

⁵¹ Lester SE, Halpern BS (2008) Biological responses in marine no-take reserves versus partially protected areas. *Mar Ecol Prog Ser* 367: 49–56.

⁵² Edgar GJ, Stuart-Smith RD, Willis TJ, Kininmonth S, Baker SC, Banks S, Barrett NS, Becerro MA, Bernard ATF, Berkhout J, Buxton CD, Campbell SJ, Cooper AT, Davey M, Edgar SC, Forsterra G, Galvan DE, Irigoyen AJ, Kushner DJ, Moura R, Parnell PE, Shears NT, Soler G, Strain EMA, Thomson RJ (2014) Global conservation outcomes depend on marine protected areas with five key features, *Nature*, **506**, 216–220.

⁵³ Kelaher BP, Coleman MA, Broad A, Rees MJ, Jordan A, et al. (2014) Changes in Fish Assemblages following the Establishment of a Network of No-Take Marine Reserves and Partially-Protected Areas. *PLoS ONE* 9(1): e85825. doi:10.1371/journal.pone.0085825

⁵⁴ McPhee, DP; Leadbitter, D and Skilleter, GA. 2002. Swallowing the Bait: Is Recreational Fishing in Australia Ecologically Sustainable? *Pacific Conservation Biology*, Vol. 8, No. 1: 40-51.

⁵⁵ For example see West Australian Fishing Industry Council chief executive John Harrison's comments to ABC program PM on the 14/11/2014 <<http://www.abc.net.au/pm/content/2014/s4128961.htm>>

⁵⁶ Of the more than half a million submissions to the public consultations on marine reserves across Australia 99.5% were in favour of higher levels of Marine National Park Zones. This is consistent with the very high levels of public support for Marine National Park Zones found in community attitude surveys. For example: Galaxy Research, 2014. *Community Attitude Survey*. Prepared for Dive Industry Association of Australia.

⁵⁷ In 1998 all Australian Government's agreed to establish a national network of Marine National Park Zones to protect marine life with a minimum of one Marine National Park Zone in each Australian marine bioregion. See: ANZECC TFMPA 1998. *Guidelines for Establishing the National Representative System of Marine Protected Areas*. Australian and New Zealand Environment and Conservation Council, Task Force on Marine Protected Areas. Environment Australia, Canberra.

parts of Australia's oceans be included within Marine National Park Zones has little to do with whether the management of particular fisheries is either good or bad.

Commercial fishers also consistently argue that Marine National Park Zones are having too great an impact on their activities.²⁰ This position is hard to support in the North Marine Region where total displacement is 2.4% of commercial fisheries active in the region and where there is almost no significant displacement of any commercial fishery even those which have been assessed by the Government as providing the greatest risks to the marine life of the North.^{19,10}

There are very strong economic, social and scientific arguments for establishing extensive Marine National Park Zones as key regional economic infrastructure for nature based tourism, particularly dive tourism and whale watching, to maintain ecosystem services and to realise the economic value of community aspirations for healthy oceans.¹⁴ Marine National Park Zones are critical to scientific research to understand Australia's oceans. They are the baselines against which it then becomes possible to understand and improve the management of current and future impacts on the Australia's oceans.⁵⁸

To guide the development of Australia's national network of marine reserves the Australian marine conservation science and planning community produced a set of guidelines on best practices for the establishment of Australia's marine reserves in 2009.⁹ Science community submissions to the public consultation process for the North Marine Reserves from the CSIRO and the Australian Marine Science Association (AMSA) each focussed on the need for the North Marine Reserves to contain more Marine National Park Zones. The CSIRO submissions focus was for new Marine National Park Zones to cover the 51 North Marine Region depth habitats which currently have no Marine National Park Zones (Table 2)⁵⁹ and for new Marine National Park Zones within the five marine reserves in the North Marine Region that currently have no Marine National Park Zones (Table 1).

TABLE 1: MARINE RESERVES WITHIN THE NORTH-WEST MARINE RESERVE NETWORK THAT CURRENTLY HAVE NO MARINE NATIONAL PARK ZONES.

Marine reserves with no Marine National Park Zones:
1. Lимmen Marine Reserve
2. Arnhem Marine Reserve
3. Arafura Marine Reserve
4. Oceanic Shoals Marine Reserve
5. Joseph Bonaparte Gulf Marine Reserve

⁵⁸ CSIRO, 2011. Submission to the Draft Commonwealth Marine Reserve Network Proposal for the North Marine Region.

⁵⁹ Just 8 of the 59 identified depth habitats in the North Marine Region have any coverage within Marine National Park Zones

TABLE 2: REPRESENTATION OF AUSTRALIAN DEPTH HABITATS⁶⁰ WITHIN MARINE NATIONAL PARK ZONES IN THE NORTH MARINE REGION.

Bioregion	% Marine National Park Zones	Number of depth habitats	Number of depth habitats with adequate representation within Marine National Park Zones ^{9,61}	Number of depth habitats with no Marine National Park Zones
Anson Beagle	0%	2	0	2
Arafura	1%	6	0	5
Arnhem Wessel	0%	2	0	2
Bonaparte Gulf	0%	7	0	7
Cambridge-Bonaparte	0%	3	0	3
Carpentaria	1%	3	0	2
Cobourg	0%	2	0	2
Groote	0%	2	0	2
Karumba-Nassau	14%	2	0	1
Oceanic Shoals	0%	9	0	9
Pellew	0%	2	0	2
Timor Transition	0%	9	0	9
Tiwi	0%	4	0	4
Torres Strait	68%	2	2	0
Wellesley	0.3%	2	0	1
West Cape York	3%	2	0	0
Total	3%	59	2	51

Equally a major focus of the AMSA submission was the poor protection within Marine National Park Zones of the biodiverse northern shelf habitats, particularly the complete lack of Marine National Park Zones west of the Wessel Islands. The current zoning of the North Marine Reserve Network leaves ten of the sixteen bioregions with no Marine National Park Zones (Table 2). This is in contravention of the national policy established by the Howard Government in 1998 and

⁶⁰ Commonwealth of Australia, 2011. *Bathomes within Australian waters*. <http://www.environment.gov.au/metadataexplorer/full_metadata.jsp?docId={1C0DC470-61A9-446C-83E2-48CC9F8356CF}&loggedIn=false>

⁶¹ IUCN World Parks Congress, 2014. *A strategy of innovative approaches and recommendations to enhance implementation of marine conservation in the next decade*. International Union for the Conservation of Nature, Gland, Switzerland.

agreed to by all Australian Governments to have at least one Marine National Park Zone in each marine bioregion.⁶² This is a major flaw in the North Marine Reserve Network that urgently needs to be addressed. It is this total failure to implement long standing national policy commitments that makes the Commonwealth Marine Reserve Network vulnerable to serious criticism from Australian scientists.^{63, 64, 65, 66}

The North Marine Region is a part of the world's most intact large system of shallow water tropical habitats⁸ including globally significant locations for seabirds and turtles.^{8, 6} These are some of Australia's most important places for marine life and they are deserving of world class protection within Marine National Park Zones. For example of the eight key ecological features⁶⁷ identified for Australian marine life in the North only three have any representation within Marine National Park Zones and none meet the minimum Australian science community⁹ and World Parks Congress⁶¹ standards for adequate protection within Marine National Park Zones. Equally of the 101 biologically important areas⁶ for dolphins, seabirds, and turtles that extend into the North Marine Region, 88 currently have no representation within Marine National Park Zones.

2A. ADVICE ON OPTIONS FOR ZONING BOUNDARIES TO ADDRESS THIS AREA OF CONTENTION:

Centre for Conservation Geography advice: The North Marine Reserve Network could be substantially improved by expanding the number of Marine National Park Zones. The Centre for Conservation Geography's advice on the top five locations for new Marine National Park Zones are the five marine reserves that currently lack Marine National Park Zones (Table 1).

1. A LIMMEN BIGHT MARINE NATIONAL PARK ZONE

A Marine National Park Zone in the Limmen Marine Reserve is recommended by the CSIRO and would satisfy the Government's long standing commitment to create a Marine National Park Zone within the Pellew Bioregion.⁶²

2. AN ARNHEM MARINE NATIONAL PARK ZONE

A Marine National Park Zone in the Arnhem Marine Reserve is recommended by the CSIRO and would satisfy the Government's long standing commitment to create a Marine National Park Zone within the Arnhem-Wessel bioregion.⁶²

⁶² ANZECC TFMPA 1998. *Guidelines for Establishing the National Representative System of Marine Protected Areas*. Australian and New Zealand Environment and Conservation Council, Task Force on Marine Protected Areas. Environment Australia, Canberra.

⁶³ Edgar, G. 2006. *Proposed Commonwealth Reserves South East Marine Region*. Australian Marine Sciences Association <http://www.amsa.asn.au/>

⁶⁴ SPRP 2006, Guidance on Achieving Comprehensiveness, Adequacy, and Representativeness in the Commonwealth waters component of the National Representative System of Marine Protected Areas, Scientific Peer Review Panel for the National Representative System of Marine Protected Areas.

⁶⁵ Pressey, B., 2013. *Australia's new marine protected areas: why they won't work*, The Conversation, <<http://theconversation.com/australias-new-marine-protected-areas-why-they-wont-work-11469>>

⁶⁶ Barr, L.M., and Possingham, H.P., 2013. Are outcomes matching policy commitments in Australian marine conservation planning? *Marine Policy*, Vol. 42: 39-48.

⁶⁷ Commonwealth of Australia, 2012. *Key Ecological Features*. <<http://www.environment.gov.au/webgis-framework/apps/ncva/ncva.jsf>>

3. AN ARAFURA MARINE NATIONAL PARK ZONE

A Marine National Park Zone in the Arafura Marine Reserve is recommended by the CSIRO and would satisfy the Government's long standing commitment to create a Marine National Park Zone within the Timor Transition and Cobourg bioregions.⁶² It would also provide the first ever protection within Marine National Park Zones of the tropical canyon systems and shelf edge and slope ecosystems of the North Marine Region, all of which are key ecological features for the region's marine life.

4. AN OCEANIC SHOALS MARINE NATIONAL PARK ZONE

A Marine National Park Zone in the Oceanic Shoals Marine Reserve is recommended by the CSIRO and would satisfy the Government's long standing commitment to create a Marine National Park Zone within the Oceanic Shoals bioregion.⁶² It would also provide the first ever protection within Marine National Park Zones of the turtle feeding habitats of the Bonaparte Gulf and the carbonate banks and terraces of Van Diemen Rise, a key ecological feature for the marine life of the North Marine Region.

5. A JOSEPH BONAPARTE GULF MARINE NATIONAL PARK ZONE

A Marine National Park Zone in the Joseph Bonaparte Marine Reserve is recommended by the CSIRO and would satisfy the Government's long standing commitment to create a Marine National Park Zone within the Anson Beagle, Cambridge-Bonaparte and Bonaparte Gulf bioregions.⁶² It would also provide the first ever protection within Marine National Park Zones of the feeding habitats for endangered Green Turtles within the Bonaparte Gulf and the interesting habitats of one the world's largest populations of Flatback Turtles nesting at Cape Dommet.

6. OTHER TOP PRIORITY LOCATIONS

Any prioritisation into a 'top five' will miss numerous locations with very high conservation values deserving of Marine National Park Zone protection. For example the Wessel, Gulf of Carpentaria and West Cape York Marine Reserves all contain additional high conservation value features which currently have 0% representation within Marine National Park Zones.

1B. OIL, GAS AND SEABED MINING

The zoning plan for the North Marine Reserve Network currently allows mining for oil, gas and minerals over 97% of the North Marine Region (Figure 2). Australians don't want mining across such large swathes of our oceans. The North Marine Reserve Network needs to find a better balance between protecting marine life and facilitating the development of the North oil and gas industry. The North Marine Region contains areas of global, national and regional significance for marine life that need to be set aside as 'no go' areas for oil and gas. For example, Limmen Bight which supports an internationally significant population of dugong⁶⁸ is not an appropriate location for experimental seabed mining (Figure 3). These are locations like seabird and turtle nesting sites where consequences for marine life in the event of an oil spill like that in the Kimberley in 2009, or from pollution from the mining of minerals would be particularly drastic. The International Council on Mining Metals recognised over a decade ago that establishing such 'no go' zones are an important aspect of the regulatory framework for mining globally.⁶⁹

The zoning plan for the North Marine Reserve Network would be substantially improved by prohibiting mining from operating in those parts of the Marine Reserves that are currently outside exploration leases. This would increase the area protected from mining and exploration from 3% to 18% of the North Marine Region.

While it may be too late to change the zoning in areas where mining leases have already been granted the zoning scheme for the North Marine Reserve Network could be considerably improved by changing the zoning to protect 18% of the North Marine Region from mining.

2B. ADVICE ON OPTIONS FOR ZONING BOUNDARIES TO ADDRESS THIS AREA OF CONTENTION:

Centre for Conservation Geography advice: As for the Coral Sea Marine Reserve, the zoning scheme for the North Marine Reserve Network needs to reflect the fact that each of the marine reserves represents a location identified by the Australian Government as having particularly high conservation values for marine life. The zoning plan should excluded mining and exploration for mining from any locations where mining leases do not already exist.

⁶⁸ Delaney, R., 2012. *Limmen Bight: Marine and coastal biodiversity values*, Northern Territory Parks and Wildlife Service, Darwin, Northern Territory, Australia.

<http://www.lrm.nt.gov.au/_data/assets/pdf_file/0020/350381/Limmen-Marine-Technical-Report.pdf>

⁶⁹ International Council on Mining and Metals, 2003. *ICMM newsletter: "No-Go" pledge signals a new era of collaboration with the conservation movement. Vol 2. Issue 4*, International Council on Mining and Metals.

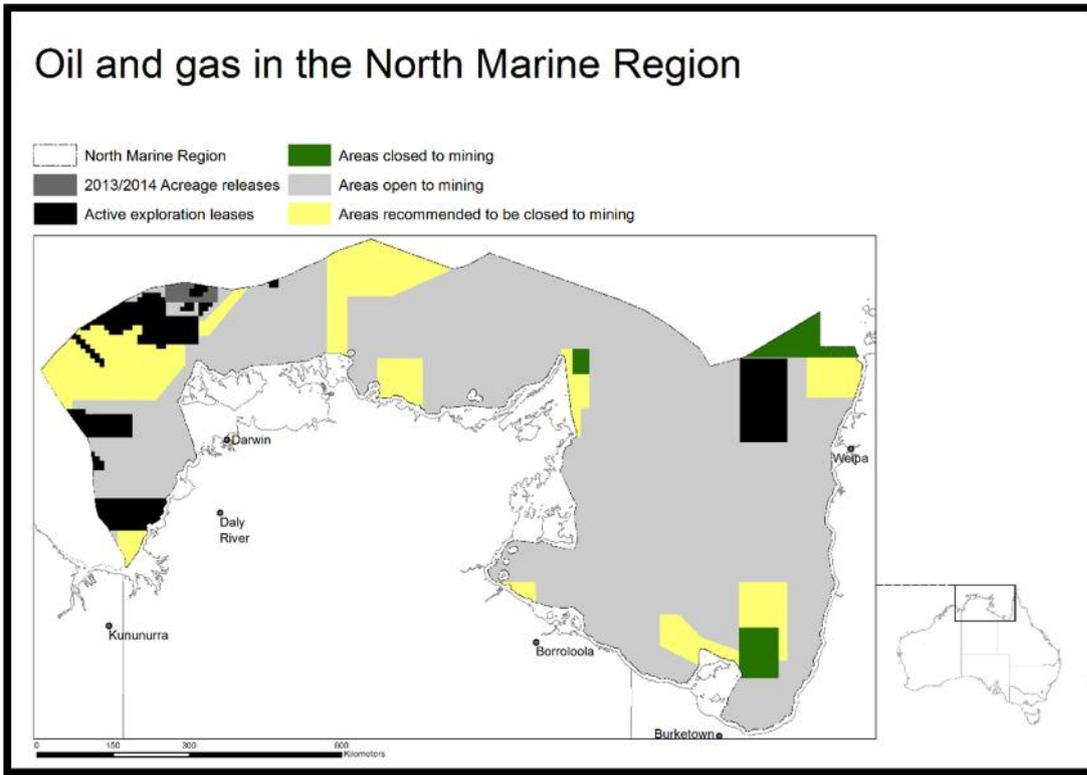


FIGURE 2: OIL AND GAS EXPLORATION AND PRODUCTION IN THE NORTH MARINE REGION.

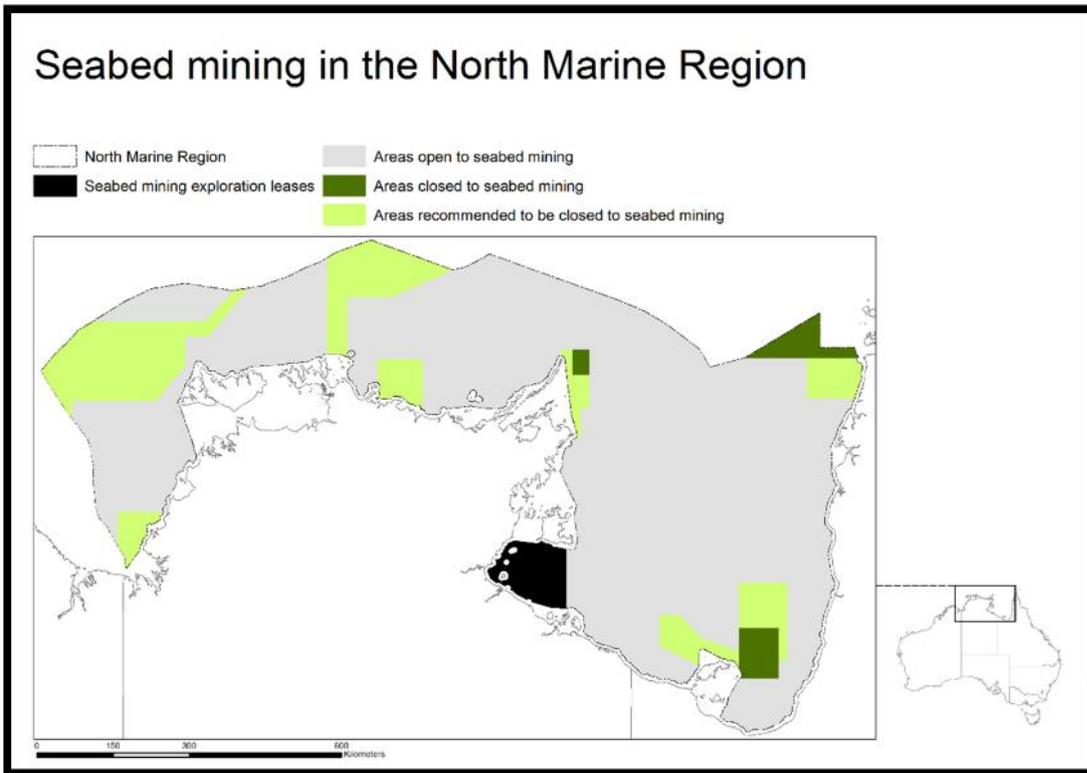


FIGURE 3: SEABED MINING IN THE NORTH MARINE REGION.

1C. DESTRUCTIVE FISHING PRACTICES

The Government's risk assessment report categorizes five fishing practices, demersal trawling, semi-demersal trawling, set mesh nets (demersal gillnets) demersal longlines and pelagic gillnets as being incompatible with the North Marine Reserve Network.¹⁰ The North Marine Reserve Network successfully protects 18% of the North from these fishing practices, but a political decision to allow the set mesh nets and pelagic gillnets into key sections of the Joseph Bonaparte Gulf, Arnhem and West Cape York Marine Reserves means that some particularly high conservation value areas for marine life remain at risk from destructive fishing practices. The North Marine Reserve Network could be substantially improved by the total removal of pelagic gillnetting and set mesh nets (demersal gillnets) from the marine reserves as has been achieved with trawling and demersal longlining and was recommended by the Government's risk assessment process.

This would significantly improve the protection of marine life and the social and recreational fishing outcomes of the North Marine Reserve Network but have minimal impact on the two commercial fisheries that use these gear types. The two fisheries using these techniques are the Queensland Gulf of Carpentaria Finfish Fishery and the Northern Territory Offshore Net and Line Fishery.

Allowing the Queensland Gulf of Carpentaria Fin Fish Fishery to operate in the West Cape York Marine Reserve reduces the potential negative impact on this fishery to zero.¹⁹ This contravenes the Government's policy which is to protect marine life in a way that minimises impact on commercial fishers, not to compromise the protection of marine life by reducing the impact on commercial fisheries to zero.⁴ Removing demersal and pelagic gillnets from the West Cape York Marine Reserve would, among other benefits, provide increased protection for the inter-nesting habitats of the world's largest nesting site for endemic Flatback Turtles at Crab Island. The impact on commercial fishers would be minimal with a potential negative impact of up to \$4,000 per license holder per annum in gross income.^{19, 70} This represents just 2.5% of the current average annual gross income per license holder of around \$200,000. This is a minimal impact to which license holders should be able to adjust easily.

While the estimates of impact on the Northern Territory Offshore Net and Line Fishery have not been released the evidence available indicates a similar situation to that of the Gulf of Carpentaria Fin Fish Fishery.⁷¹ The fact that less than 5 of the 12 licences active in the fishery are active within the Commonwealth Marine Reserves is indicative of the minimal impact that removal of this fishery from marine reserves would have on commercial fishers.⁷¹

Allowing these two fisheries to continue to operate within the marine reserves against the advice of the Government's risk assessment process undermines the integrity and conservation, social and economic benefits of the North Marine Reserve Network for no obvious commercial benefit.

⁷⁰ Queensland Government, 2012. *Gulf of Carpentaria Inshore Fin Fish Fishery: 2011 fishing year report*, Department of Agriculture, Fisheries and Forestry, Brisbane, QLD, Australia.

⁷¹ ABARES 2011, *Interim estimates of potential catch and gross value of production impacts of draft marine reserves in the North Marine Region*, ABARES report to client prepared for the Department of Sustainability, Environment, Water, Population and Communities, Canberra, November.

2C. ADVICE ON OPTIONS FOR ZONING BOUNDARIES TO ADDRESS THIS AREA OF CONTENTION:

Centre for Conservation Geography advice: The zoning plan for the North Marine Reserve Network could be substantially improved by removing set mesh nets and pelagic gillnets from all marine reserves as recommended by the Government's fishing gear risk assessment.¹⁰

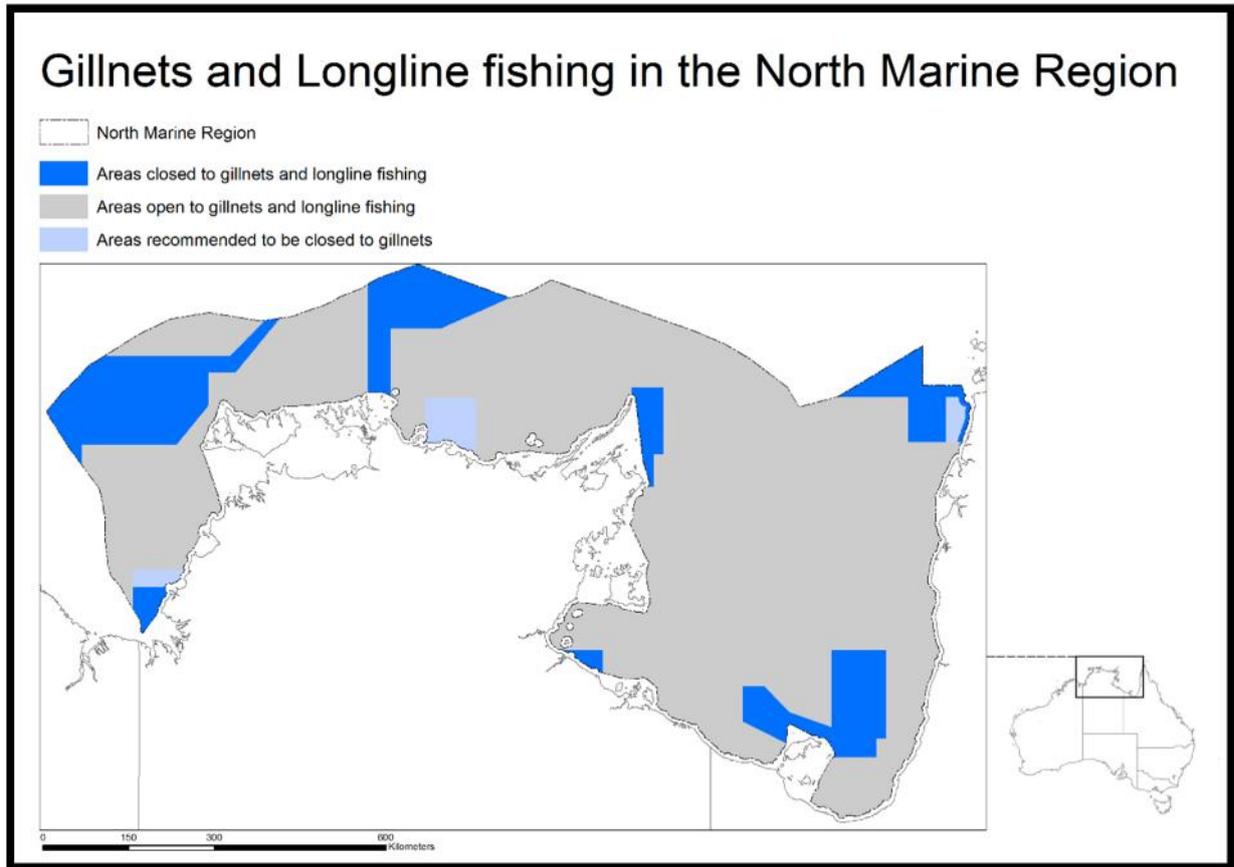


FIGURE 4: AREAS CURRENTLY CLOSED AND RECOMMENDED TO BE CLOSED TO DESTRUCTIVE FISHING PRACTICES IN THE NORTH MARINE REGION.

3. IMPROVING SOCIAL AND ECONOMIC CONSIDERATIONS.

Where Government planning processes overlap with Indigenous people's sea country this needs to be recognised by incorporating traditional owners as a decision maker rather than a stakeholder within the process.⁷² Even if native title doesn't extend into Commonwealth waters traditional owners and rangers have important cultural, social, environmental and economic perspectives, knowledge and aspirations that need to be better incorporated into the planning process. Existing Indigenous ranger groups already involved in managing their sea country in the North Marine Region are likely to have key skills, knowledge and capacity to assist with the management of the new Commonwealth Marine Reserves (Table 3). For example, in 2013 the Yolngu Wanga Watangu, supported by the Commonwealth and Northern Territory Governments, declared Australia's first sea country Indigenous protected area.⁷³ The Dhimurru Sea Country IPA overlaps with the Wessel Commonwealth Marine Reserve and the Dhimurru Rangers expect to make a significant contribution to and involvement in the management of the reserve.

Much greater consideration needs to be given to how Indigenous ranger groups could be involved in Commonwealth Marine Reserve decision making and management.

The most valuable contributions to the incorporation of social and economic considerations into decision making for marine reserves have been those reports which spatially quantify the social and or economic considerations. For example the NSW Game Fishing Database⁷⁴, or The National Recreational and Indigenous Fishing Survey⁷⁵ for recreational fishing activities, or the Atlas of Australian Marine Fishing and Coastal Communities⁷⁶ for commercial fishing or The economics of marine protected areas by the Allen Consulting Group¹⁴ for overall economic analysis of the potential positive and negative impacts of the marine reserves. These reports, by providing publicly available evidence on the social and economic considerations, create the opportunity for stakeholders and decision makers to engage in an evidence based dialogue using a common language. In the absence of this publicly available data it becomes too easy for vested interests and individuals to destabilise the decision making process with baseless assertions.

⁷² For example see North Kimberley Saltwater Country Steering Committee, 2010. *North Kimberley Saltwater Country Plan*, Mayala Native Title Claim Group, Dambimangari Corporation, Wunambal-Gaambera Aboriginal Corporation, Balanggarra Native Title Claim Group and Kimberley Land Council, Kimberley, Western Australia.

⁷³ Dhimurru Aboriginal Corporation, 2013. *Dhimurru launches sea country IPA management plan*, <<http://www.dhimurru.com.au/sea-country-ipa-management-plan-launch.html>>

⁷⁴ See <http://www.dpi.nsw.gov.au/fisheries/recreational/saltwater/gamefish-tagging> for more information.

⁷⁵ Henry, G.W., and Lyle, J.M., 2003. *The National Recreational and Indigenous Fishing Survey*, Australian Government Department of Agriculture, Fisheries and Forestry, Canberra, ACT, Australia.

⁷⁶ Larcombe J., Charalambou, C., Herreria, E., Casey, A.M. and Hobsbawn, P., 2006. *Marine Matters National: Atlas of Australian Marine Fishing and Coastal Communities*, Department of Agriculture, Fisheries and Forestry, Canberra, ACT, Australia.

TABLE 3: COMMONWEALTH MARINE RESERVES AND INDIGENOUS GROUPS WITH OVERLAPPING, ADJACENT, OR CLOSEST SEA COUNTRY SUBJECT TO NATIVE TITLE DETERMINATIONS OR REGISTERED NATIVE TITLE APPLICATIONS.⁷⁷

Commonwealth Marine Reserves in the North Marine Reserve Network	Indigenous groups with overlapping, adjacent, or closest sea or coastal country
Joseph Bonaparte Gulf	Legune, Spirit Hills, Bradshaw Station
Oceanic Shoals	Labelle Downs/Lower Reynolds, Larrakia, Tiwi (Bathurst, Melville Islands), Gurig.
Arafura	Croker Island (Yuwurruma)
Arnhem	Northern Land Council member groups, incl. groups associated with Mardbalk Marine Rangers and Djelk Rangers.
Wessel	Northern Land Council member groups, incl. groups associated with Dhimmurru Rangers.
Limmen	Lorella-Nathan River claimants.
Gulf of Carpentaria	Lardil, Yangkaal, Gangalidda, Kaiadilt, Kowanyama.
West Cape York	Members of Torres Strait Regional Sea Claim, Kuarareg, Ankamuthi, members of combined Northern Cape York applicants.

Throughout the planning process, the Federal Government has explicitly aimed to minimise any potential negative social or economic impacts on fishing communities and recreational fishers. Unfortunately there has generally been a failure on the part of Government to attempt to measure the potential positive impacts of marine reserves on fishing communities and recreational fishers. The assumptions around and focus on potential negative impacts has offered little scope for investigating in a comprehensive way whether fishers think that marine reserves are positive or negative in the first place, or assess the actual impacts marine reserves are having on fishers.

For example, at the present time there is very little published evidence of negative impacts of marine reserves on recreational fishers. Indeed claims that marine reserves have a negative economic impact on the recreational fishing industry have yet to be backed up with credible evidence. This is in spite of marine reserves having existed in Australia for well over 40 years.

Research investigating the effects of marine national park zones on recreational fishing in Australia up to the present time has in fact displayed either positive effects or trends, such as increased participation in fishing within marine reserves and overall support for well

⁷⁷ Information regarding native title determinations and registered native title applications has been sourced from: National Native Title Tribunal, 2014. *National Native Title Register (Determinations) - boundaries and core attributes*. Nov 2014 ed. National Native Title Tribunal, Perth, and National Native Title Tribunal, 2014. *Native Title Determinations Applications (Register)*. Nov 2014 ed. National Native Title Tribunal, Perth.

established marine reserves. Even in cases where recreational fishing lobby groups have been the most opposed to proposed marine reserve management, research has largely displayed an absence of any significant or sustained negative impacts.

In Ningaloo Marine Park, for example, overall visitor numbers have skyrocketed since the implementation of the Marine Park in 2004, with recreational fishers reporting 98% satisfaction with their experience, and no evidence has yet been gathered of fishers choosing to travel to other parts of Australia to fish as a result of the implementation of the park.³⁹ Researchers in fact found considerable evidence of both return and new visitors engaging in recreational fishing within the marine park.³⁷ In Moreton Bay Marine Park, both independent research and studies commissioned by recreational fishing peak bodies found that marine park zonings had virtually no impact on fishing effort, did not spatially displace this effort over a 20 year period, and did not lead to any decline in participation. An empirical study of real impacts and displacement of recreational fishing found that the recreational fishing industry expanded by \$1.3-2.1m per year since the rezoning of the Moreton Bay Marine Park in 2009, and that while 'perceived' displacement was significant, actual displacement was minimal.^{78, 79, 80}

Even if these trends are not attributed directly to the presence of the marine park, they demonstrate at the very least that marine parks do not have the devastating impact on local economies as has been claimed. Such predictions include a study claiming that an annual negative economic impact of \$6-48m would arise from the rezoning of the Moreton Bay Marine Park. The obvious gulf between such predictions and the actual impacts demonstrates that the methodologies used to assess marine park impacts on recreational fishing have been seriously flawed, and that approaches which do not account for the latent strong support for, and perceived benefits of protection among recreational fishers, are not credible.

Research on attitudes toward marine parks among fishers across the country also demonstrate high levels of genuine support for marine reserves among recreational fishers.^{38, 39, 80, 32, 37, 33, 81, 34,}⁸² Of particular interest is recent research documenting at length the concerns of a focussed sample of local recreational fishers in two controversial marine reserves in NSW, considered by researchers to be those community members most likely to oppose marine reserves.⁸² Results from interviews noted that for 75% of respondents there had been no decrease in fishing effort since implementation of marine park zoning, and that approximately 5-6 years after zoning restrictions being in place, 63% of respondents were either supportive of the marine reserve, or acknowledged it had not greatly affected their fishing.⁸² Again it should be stressed these figures are for a sample expressly recruited for their likelihood to oppose marine reserves.

⁷⁸ Pascoe, Sean, et al. "Economic value of recreational fishing in Moreton Bay and the potential impact of the marine park rezoning." *Tourism Management* 41 (2014): 53-63

⁷⁹ Infofish (2014) 'Moreton Bay Marine Park and Tagging' Report prepared for Australian National Sportfishing Association <http://suntag.org.au/wp-content/uploads/2014/06/Moreton-Bay-Marine-Park-and-tagging.pdf>

⁸⁰ DERM (2012) *Moreton Bay Marine Park monitoring program February 2012*, DERM, State of Queensland

⁸¹ Prior, S.P and Beckley, L.E. (2007), *Characteristics of recreational anglers in the Blackwood Estuary, a popular tourist destination in southwestern Australia*, *Tourism in Marine Environments*, Vol. 4, Number 1, pp. 15-28

⁸² Voyer, Michelle, William Gladstone, and Heather Goodall. "Understanding marine park opposition: the relationship between social impacts, environmental knowledge and motivation to fish." *Aquatic Conservation: Marine and Freshwater Ecosystems* 24.4 (2014): 441-462

Similarly research from the Great Barrier Reef found that 5 years after the implementation of the 2004 management plan, a majority of fishers were supportive of the zoning restrictions put in place.⁸³ Rather than being dissuaded from fishing, recreational fishers were able to creatively adapt where and how they fished. In fact, effort was mostly redistributed into inshore areas, not into more dangerous open ocean waters further offshore as was feared.⁸³

These local trends are also reflected in industry wide surveys. A 2011 survey commissioned by the Fisheries Research and Development Corporation found, for example, that when fishers were asked to cite examples of advancement in the management Australian fisheries, the establishment of marine reserves was the second most common answer, and a reason for optimism regarding the future of recreational fishing. In contrast, only a subset of the 14% of fishers who felt pessimistic about future fishing opportunities, felt that spatial restrictions on fishing were a significant threat to the future of recreational fishing.³⁶

These various studies taken together strongly suggest that marine reserves do not have the negative impacts commonly feared, and moreover that the views of vocal anti-marine reserve lobby groups do not adequately represent the views of the wider recreational fishing community.

Related to this is that the absence of hard evidence of sustained negative economic impacts on the recreational fishing industry, or of declines in recreational fishing participation and effort in marine reserves over the medium to long term, also raises the prospect that anecdotal reports of economic downturns upon zoning implementation may not be a function of zoning restrictions themselves. By their very nature zoning restrictions take time to have an observable effect, either environmentally or in terms of their impact on human use, in the latter case as people test out the new arrangements and adjust their behaviour according to whether the restrictions do in fact substantially improve or degrade their experience. Fluctuations in use and expenditure on visitation in the first year or two of a marine park's life are better explained as the result of the expectations of how marine parks will effect visitor experiences. In the case of immediate visitation or fishing participation downturns, where they have occurred it is highly likely they are due as much to negative perceptions of marine reserves generated by vocal anti-marine reserve lobby groups as to any other factor. It is also clear from the longer term trends that recreational fishers do not continue to pay attention to these views once their own experiences demonstrate that marine reserves do not adversely affect their ability to go fishing.

Consideration of any potential impacts should therefore be weighed against actual evidence from studies investigating these impacts in existing marine reserves, and evidence of the views of the wider recreational fishing community should be taken into account, rather than focusing on the views of particularly vocal minority groups. Any decision-making process on existing marine reserves should also be based on comprehensive monitoring of the ecological, social and economic aspects, and any decisions to wind back protections in the absence of credible, widely accepted evidence demonstrating the need for such measures would be an extremely negative development.

This emphasises the need for the development of a research program that assesses and analyses the actual social and economic impacts of the reserves and compares them to the claimed, or estimated impacts prior to the establishment of the marine reserves. Such research will be critical to assisting future decision making processes around marine reserves.

⁸³ De Freitas, Débora M., et al. "Spatial substitution strategies of recreational fishers in response to zoning changes in the Great Barrier Reef Marine Park." *Marine Policy* 40 (2013): 145-153.

CONCLUSIONS

With regard to the deliberations of the Government's marine reserves review the Centre for Conservation Geography draws the following four conclusions:

1. The review should consider the extensive evidence that Australian recreational fishers support, and perceive benefits from, the Marine National Park Zones already established around the Australian coastline in areas of well-documented importance for recreational fishing. In considering arguments that recreational fishers oppose or are negatively impacted by marine parks and sanctuaries, the review should seek supporting empirical evidence of a quantity and quality of that presented here in order for those arguments to be considered credible within the scientific underpinnings of the review.
2. The review's consultation with the recreational fishing community is unlikely to be adequate or credible if it cannot demonstrate that it has effectively consulted and considered the views of the grass roots community beyond peak bodies, clubs and lobby groups. It is clear from recent studies that the views and attitudes of these groups are divergent from the broader recreational fishing community and tend to represent the attitudes of a particular minority. For example, the Save Our Marine Life Alliance who commissioned this report includes tens of thousands of Australian recreational fishers among their active supporters.
3. The review should question the credibility of modelling or impact prediction studies that consider only negative impacts, or do not fully incorporate the evidence of perceived positive benefits, to recreational fishing caused by Marine National Park Zones. Recent experience from other planning processes has demonstrated that these approaches produce spurious results and they are directly contradicted by the empirical, peer-reviewed science on the impacts of Australia's marine reserves; even where Marine National Park Zones have been established in far closer proximity to areas of major importance to recreational fishers than those being reviewed by the Government's marine reserves review.

Centre for Conservation Geography Recommendations: (1) That the Government give greater consideration to how and when traditional owners are involved in decision making and management around marine reserves. (2) That the Government increase its investment in the publishing and periodically updating of spatial datasets on the existing patterns of use in the marine environment to improve the incorporation of social and economic considerations into decision making in future marine planning and management. (3) That the Government establish a research program that monitors and assesses the social and economic impacts of the Commonwealth Marine Reserves.

4. ONGOING ENGAGEMENT WITH REGIONAL STAKEHOLDERS

A key aspect of ongoing engagement with regional stakeholders should be the development of accessible and credible community science programmes. Community science enables regional communities to be involved and invested in the collection of robust data for use in the ongoing monitoring and management processes of the marine reserve. In addition to providing data critical for management, it provides communities with an opportunity to better understand, and contribute towards, the functioning of the marine reserve. Indigenous communities through their ranger programs, recreational fishers through programs like the NSW Game Fishing Tagging Database⁷⁴ and Redmap⁸⁴ and divers via surveys for Reef Life Survey⁸⁵ are already engaged in research activities in the North Marine Region. These opportunities for involvement should be expanded as part of the ongoing engagement with regional stakeholders in the management of the North Marine Reserve Network.

⁸⁴ See <http://www.redmap.org.au/> for more information.

⁸⁵ See <http://reeflifesurvey.com/> for more information.

5. ZONING OPTIONS

Over more than two decades Australian and international scientists have compiled a huge body of evidence on the value and science of Marine National Park Zones (e.g. Edgar et al. 2014⁵²; Lubchenco et al. 2003⁸⁶; Ballantine 1991⁸⁷). Currently Marine National Park Zones are the only zones within the North Marine Reserve Network for which definitive scientific evidence exists for their effectiveness in protecting marine life. Studies into partially protected zones have shown that they don't deliver effective protection for marine life ^{47, 48, 49, 50, 51, 52, 53} but can be useful for preventing habitat damage, or achieving other social, economic, or scientific objectives. Monitoring effort will need to be focussed on the status of marine life in partially protected zones to ensure adaptive management.

In 2009 the Australian marine conservation science and planning community developed a consensus statement to provide scientific guidance to the development of Australia's National Representative System of Marine Protected Areas.⁹ These guidelines establish the Australian scientific benchmarks for the protection of conservation features within Marine National Park Zones at between 30% and 100%. These guidelines are the same as those set by the 2014 World Parks Congress where the nations of the world, including Australia, committed to protecting at least 30% of all marine habitats within Marine National Park Zones across the world's marine bioregions by 2030.⁶¹

In general the zoning plan for the North Marine Reserve Network contains too many multiple use, special purpose zones which fail to protect marine life from destructive fishing practices and/or seabed mining and too few Marine National Park Zones. It is particularly problematic that all of the partially protected zones fail to exclude one or more fishing practices classed as incompatible with the North marine reserves by the Government's risk assessment process.¹⁰ The Centre for Conservation Geography considers that almost all areas within the existing Multiple Use and Special Purpose Zones could be reallocated to a Conservation Park Zone that excluded mining and fishing practices classed as incompatible with the marine reserves by the Government's risk assessment process.¹⁰ This would significantly simplify the management arrangements reducing the costs associated with effectively managing the reserves and improve the integrity and environmental, social and economic outcomes of the network.

MARINE NATIONAL PARK ZONES

The boundaries of the Marine National Park Zones of the North Marine Reserve Network are designed primarily to fulfil the following policy objectives:

1. Maximise the protection of biodiversity (see section: Maximising marine biodiversity protection).
2. Maximise potential social and economic benefits to the Australian community, by securing valuable non-market benefits and providing secure key economic infrastructure for one of the major industries active in the North Marine Region (nature-based tourism) (see section: Social and Economic Impacts).
3. Minimise potential negative social and economic impacts particularly on recreational and commercial fishers (see section: Social and Economic Impacts).

⁸⁶ Lubchenco J, Palumbi SR, Gaines SD, Andelman S (2003) Plugging a hole in the ocean: the emerging science of marine reserves, *Ecological Applications*, 13(1), S3-S7

⁸⁷ Ballantine WJ (1991) *Marine Reserves for New Zealand*, University of Auckland, Auckland, New Zealand.

Some changes are needed to the North Marine Reserve Network to bring the number and size of Marine National Park Zones into line with the recommendations of Australia's science community (see section 1A. Marine National Park Zones).

Centre for Conservation Geography advice:

1. Maintain the existing Marine National Park Zones that play the critical role in achieving the Coalition's policy objective of maximising marine biodiversity protection while minimising negative social and economic impacts.⁴
2. Create additional Marine National Park Zones to address the concerns of the Australian scientific community as outlined in section 1A. Marine National Park Zones.

MULTIPLE USE ZONES

The North Marine Reserve Network contains nine Multiple Use Zones stretching right across the network. The Multiple Use Zones allow seabed mining and oil and gas mining. The marine reserves constitute areas identified by the Australian Government as of particularly high conservation value for marine life. Continuing to allow destructive activities like mining undermines the integrity of the zoning system. Additionally it potentially causes scarce tax payers resources to be wasted by investing money in conservation in locations where destructive activities are being allowed to continue. While it may be too late for those locations where exploration leases have already been allocated (Figure 2) mining and mining exploration should not be allowed within marine reserves outside these existing exploration leases.

Centre for Conservation Geography advice:

1. Change Multiple Use Zones outside of existing mining exploration leases to Conservation Park Zones.

SPECIAL PURPOSE ZONES

The North Marine Reserve Network contains three Special Purpose Zones. This zone appears specially designed to benefit two particular fisheries Queensland's Gulf of Carpentaria Fin Fish Fishery and the Northern Territory's Offshore Net and Line Fishery. Both of these fisheries were assessed as incompatible with marine reserves by the Government's risk assessment process due to their use of set mesh nets (demersal gillnets) and pelagic gillnets.

The Special Purpose Zones appear to reduce the impact on these two commercial fisheries from minimal to zero.¹⁹ This contravenes the Government's policy which is to protect marine life in a way that minimises impact on commercial fishers, not to compromise the protection of marine life by reducing the impact on commercial fisheries to zero.⁴

Centre for Conservation Geography advice:

1. Change Special Purpose Zones to Conservation Park Zones.

GENERAL USE ZONES

The North Marine Reserve Network contains no General Use Zones. However the management plans proposed by the Labor Government in 2013 and set aside by the Coalition Government the Northern Prawn Fishery successfully lobbied the previous Government to allow it to continue trawling in the high conservation value areas around the Wellesley Islands despite this

being in contravention of the Government's risk assessment process. At less than 3% the potential negative impact of the North Marine Reserve Network on the Northern Prawn Fishery is already minimal. This potential negative impact is very unlikely to be realised with the more likely outcome being a similar volume of prawns continuing to be caught in slightly different locations. Regardless this minimal impact (~\$0.04 million per license holder per annum potential change in gross income^{19,88}) should easily be absorbed by a fishery that has experienced an increase in gross income per license holder of around \$0.5 million per annum as a result of tax payer funding of greater than \$50 million to implement structural adjustment in the fishery.^{89, 90}

Centre for Conservation Geography advice:

1. No General Use Zones are required in the North Marine Reserve Network to minimise impact on commercial fishers.

⁸⁸ Fletcher, W.J. and Santoro, K. (eds). (2013). *Status Reports of the Fisheries and Aquatic Resources of Western Australia 2012/13: The State of the Fisheries*. Department of Fisheries, Western Australia.

⁸⁹ Vieira, S, Perks, C, Mazur, K, Curtotti, R and Li, M 2010, Impact of the structural adjustment package on the profitability of Commonwealth fisheries, ABARE research report 10.01, Canberra, February.

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6. RESEARCH PRIORITIES

Future priorities for scientific research and monitoring on marine biodiversity for the North Marine Reserve Network should focus on the status of those key conservation assets for which protection remains low. The top priorities being:

1. Upper slope ecosystems, particularly key ecological features like the Arafura Canyons which currently have 0% protection within Marine National Park Zones.
2. Shelf ecosystems, particularly those bioregions which currently have 0% protection within Marine National Park Zones and biologically important areas like breeding and feeding grounds for sawfish, dugong, seabirds and turtles.
3. Key ecological features and biologically important areas particularly for key species or locations like the plateaux and saddle west of the Wellesley Islands, Van Diemen Rise and the Bonaparte Gulf which currently have 0% protection within Marine National Park Zones.

Research priorities should be on documenting the diversity and abundance of marine life of each of these conservation assets. Research needs to be targeted towards a capacity to monitor changes in condition of these key conservation assets across every zone within the North Marine Reserve Network as well as condition inside and outside the marine reserve network to allow for adaptive management if it becomes clear that either new marine reserves are required or that a zone is not effectively protecting the marine life within it.

7. ADDRESSING INFORMATION GAPS

Australia's science community has done an outstanding job of delivering high quality, world leading science to provide a robust, evidence based decision making environment for the development of Australia's National Representative System of Marine Protected Areas (NRSMPA). Going forward the two key areas for future research will be in monitoring the ecological, social and economic impacts of the existing NRSMPA and continuing to develop the ecological, social and economic data to support the future additions to the NRSMPA.

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