

**The case for moderation of marine bioregional planning processes  
in Australia**

By Ben Diggles PhD

A submission to the Parliamentary Inquiry into the Environment Protection and Biodiversity  
Conservation Amendment (Bioregional Plans) Bill 2011

For the attention of:

The Committee Secretary  
Senate Standing Committees on Environment and Communications  
PO Box 6100  
Parliament House  
Canberra ACT 2600  
Australia

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## Executive Summary

Australia has achieved substantial marine environmental conservation to date via inclusion of 10% of its EEZ in MPAs. Together with fisheries management arrangements throughout the EEZ that effectively meet ICUN Categories IV, V, VI, this means that Australia is likely to have already fulfilled its international marine conservation obligations under the Jakarta Mandate. Yet the scale of the marine bioregional planning process that is currently underway in Australia is unparalleled in any other maritime nation, with the country at the threshold of greatly exceeding its international obligations for marine conservation over the next 2 years.

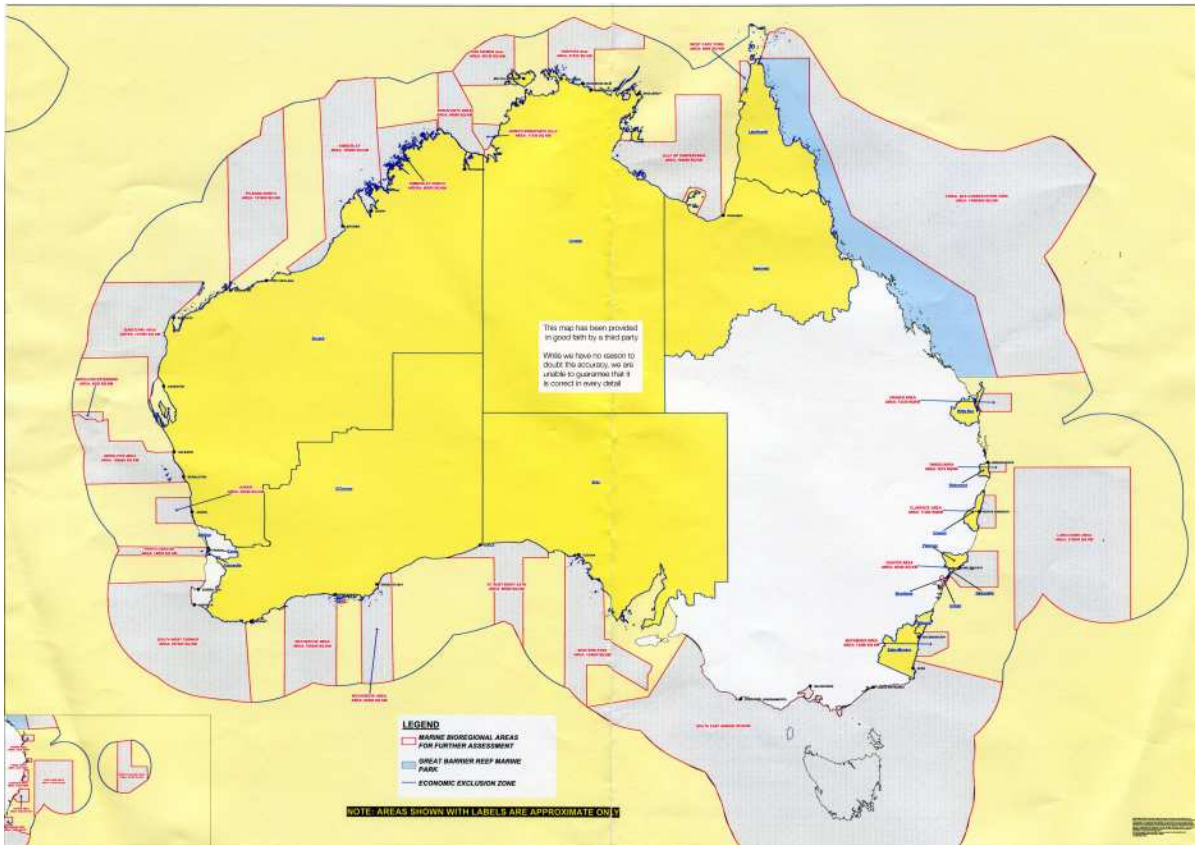
It is important for the Federal Government to get the process and balance right in order to avoid unnecessary hardship for Australias commercial and recreational fishing industries. The confidence of fishing stakeholders and fishing, tourism and marine related industries in the planning process has been eroded and their uncertainty increased through misinformation spread by environmental NGOs and some Governments. Displaced activities advice appears to suggest that rights held by fishing and tourism industry stakeholders can be extinguished by the crown without any compensation whatsoever, which has also increased uncertainty substantially.

Calls by environmental NGOs and some scientists for large “no –take” sanctuaries are based mainly on philosophical grounds, rather than science. MPAs are no panacea, and indeed in Australia they have been demonstrably incapable of protecting biodiversity, especially in areas where environmental degradation is occurring. There is scientific justification for establishment of small “no-take” marine sanctuary areas (ICUN Category Ia, Ib) inside larger multiple use MPAs where they have clear, measurable objectives that relate to achievable benefits for research, tourism, biodiversity and other ‘no-take’ outcomes (which can also include some forms of recreational fishing). There is, however, no scientific justification supporting large no-take MPAs where they are advocated as a precaution against hypothetical ‘bad practices’ in the management of fisheries.

Marine conservation in a developed country like Australia with strong governance and largely effective fisheries management means “all or nothing” management arrangements that call for large “no-take” sanctuary zones are simply not necessary. Indeed, the bigger the no-take zones, the bigger the problems that will come with them. This is why a moderate science-based approach to establishment of the NRSMPA is required. A pragmatic approach to MPAs that maximizes stakeholder involvement during the NRSMPA process and embraces adaptive and/or co-management arrangements after zoning is completed (including transparent regulation of research activities), will be the one most likely to ultimately achieve conservation objectives. Even then, significant resources will be required to administer the new MPAs or else they will fail to meet their objectives. The Government must be careful not to bite off more of the EEZ than it can chew. Given the fact that Australias international obligations for marine protection are largely fulfilled by its existing MPA network, 9 years ahead of the new international target, there is no need to rush the remaining NRSMPA assessment process. Given the uncertainties and national interest in this process, it seems logical to add some additional checks and balances into it, to make sure its done right. This could be assisted by making bioregional plans disallowable instruments for the purposes of section 46B of the *Acts Interpretation Act 1901*.

# 1 *Bioregional planning generates uncertainty within Australian marine industries*

The scale of the marine bioregional planning process that is currently underway in Australia is unprecedented and probably unparalleled in any other country. As can be seen in Figure 1, a considerable proportion of the EEZ is under assessment for further protection within Marine Protected Areas (MPAs) under the Environmental Protection and Biodiversity Conservation (EPBC 1999) Act.



**Figure 1. Map showing the extent of the regions being considered for further assessment under the current marine bioregional planning process.**

The bioregional planning process encompasses Commonwealth waters from 3 nautical miles to 200 nautical miles from the Australian coast. The Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) (formerly Department of Environment, Water, Heritage and the Arts (DEWHA)), states on its website that “*Commonwealth waters are protected as a Matter of National Environmental Significance under the EPBC Act*”<sup>1</sup>. DSEWPC further states that “*The aim of marine bioregional planning is to improve the way our oceans are managed and ensure they remain healthy and productive so we can continue to use and enjoy them into the future.*” While further protection for the marine environment is a laudable

<sup>1</sup> <http://www.environment.gov.au/coasts/mbp/index.html>

objective, what does this actually mean for stakeholders in real terms ? In recent times, from my correspondence and conversations with representatives from the various fishing, marine and regional tourism industries throughout the country, the marine bioregional planning process has brought unprecedented uncertainty, as well as social and economic costs, to the millions of stakeholders these industries represent. Much of this uncertainty has stemmed from the tools being used to direct the final stages of the planning process, the way that the planning process has been managed in recent years by the Federal Government, and the activities and media generated by several prominent environmental Non Government Organisations (NGOs) who have become more involved with the process in recent years.

The information contained in the DSEWPC website indicates that this process began in 1992, when Australia became a signatory to the Convention on Biological Diversity and the major components of the Jakarta Mandate developed under that Convention. The agreement was ratified on 18 June 1993 and came into force on 29 December 1993. Guidelines for establishing a National Representative System of Marine Protected Areas (NRSMPA) were developed by the Australian and New Zealand Environment and Conservation Council (ANZECC) in 1998 (ANZECC 1998) and a strategic plan for action was produced in 1999 (ANZECC 1999). This plan adopted the 6 categories outlined by the International Union for the Conservation of Nature and Natural Resources (ICUN) guidelines for protected area management (Table 1), as did the draft Australian Handbook for Application of ICUN Protected Area Management Categories (WCPA 2000). Then in 2002, the Australian government made an international commitment at the World Summit on Sustainable Development to establish a representative network of marine reserves by 2012<sup>2</sup>, an international target that has since been revised to 2020<sup>3</sup>. The fact that the USA did not ratify the Convention on Biological Diversity<sup>4</sup> may explain why US environmental NGOs have become so active in Australia during the bioregional planning process (see below).

Since 2002, a lot of very good scientific work has been undertaken characterizing Australias various marine and coastal ecosystems (e.g. Brewer et al. 2007) through the Interim Marine and Coastal Regionalisation for Australia (IMCRA) classification process (Commonwealth of Australia 2006). The IMCRA classifications provide the national and regional planning framework for developing the NRSMPA, with ecosystems used as the basis for determining representativeness.<sup>5</sup> The stated goals of the NRSMPA relate primarily to the conservation of biodiversity and sustainable and equitable management of human usage through establishment and management of a “comprehensive, adequate and representative” system of MPAs. The DSEWPC website states that these MPAs are expected to “*contribute to the long-term ecological viability of marine and estuarine systems, to maintain ecological processes and systems, and to protect Australia's biological diversity at all levels*”. This broad statement has already been falsified in several existing MPAs in Australia, so the assumptions underlying the statement deserve closer scrutiny, and they will be examined elsewhere in this document. The NRSMPA process is understood to aim to include some highly protected areas (IUCN Categories Ia, Ib and II) in each bioregion.

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<sup>2</sup> <http://www.environment.gov.au/coasts/mpa/southeast/index.html>

<sup>3</sup> <http://www.cbd.int/decision/cop/?id=12268>

<sup>4</sup> <http://www.cbd.int/information/parties.shtml>

<sup>5</sup> <http://www.environment.gov.au/coasts/mpa/nrsmpa/index.html>

**Table 1. Categories for protection as defined by the IUCN World Commission on Protected Areas.**

<b>CATEGORY Ia:</b>	<b>Strict Nature Reserve: protected area managed mainly for science</b>
<b>Definition</b>	Area of land and/or sea possessing some outstanding or representative ecosystems, geological or physiological features and/or species, available primarily for scientific research and/or environmental monitoring.
<b>CATEGORY Ib</b>	<b>Wilderness Area: protected area managed mainly for wilderness protection</b>
<b>Definition</b>	Large area of unmodified or slightly modified land, and/or sea, retaining its natural character and influence, without permanent or significant habitation, which is protected and managed so as to preserve its natural condition.
<b>CATEGORY II</b>	<b>National Park: protected area managed mainly for ecosystem protection and recreation</b>
<b>Definition</b>	Natural area of land and/or sea, designated to (a) protect the ecological integrity of one or more ecosystems for present and future generations, (b) exclude exploitation or occupation inimical to the purposes of designation of the area and (c) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible.
<b>CATEGORY III</b>	<b>Natural Monument: protected area managed mainly for conservation of specific natural features</b>
<b>Definition</b>	Area containing one, or more, specific natural or natural/cultural feature which is of outstanding or unique value because of its inherent rarity, representative or aesthetic qualities or cultural significance.
<b>CATEGORY IV</b>	<b>Habitat/Species Management Area: protected area managed mainly for conservation through management intervention</b>
<b>Definition</b>	Area of land and/or sea subject to active intervention for management purposes so as to ensure the maintenance of habitats and/or to meet the requirements of specific species.
<b>CATEGORY V</b>	<b>Protected Landscape/Seascape: protected area managed mainly for landscape/seascape conservation and recreation</b>
<b>Definition</b>	Area of land, with coast and sea as appropriate, where the interaction of people and nature over time has produced an area of distinct character with significant aesthetic, ecological and/or cultural value, and often with high biological diversity. Safeguarding the integrity of this traditional interaction is vital to the protection, maintenance and evolution of such an area.
<b>CATEGORY VI</b>	<b>Managed Resource Protected Area: protected area managed mainly for the sustainable use of natural ecosystems</b>
<b>Definition</b>	Area containing predominantly unmodified natural systems, managed to ensure long term protection and maintenance of biological diversity, while providing at the same time a sustainable flow of natural products and services to meet community needs.

After a 15 year gestation period, the process of finally implementing a representative system of MPAs began in 2007 with the declaration of 14 MPAs totalling 381,314 km<sup>2</sup> within the South East Commonwealth Marine Reserve Network. These included reserves under ICUN Categories, Ia, II, and IV, with 154,435 km<sup>2</sup> (40.5%) of the reserve area declared as ICUN Category Ia (sanctuary), 104,000 km<sup>2</sup> (27%) declared as ICUN Category IV (habitat protection), 122,556 km<sup>2</sup> (32%) declared as ICUN IV (multiple use or special purpose), and 389 km<sup>2</sup> declared as ICUN II (Recreational use). The sanctuary zones are managed primarily for scientific research, monitoring and where appropriate, passive uses, and exclude all fishing<sup>6</sup>. The special purpose zones are closed to commercial fishing, but allow recreational fishing<sup>7</sup>, while 21% of the network is classified multiple use where low-impact commercial fishing methods and other activities are permitted. Feedback from representatives of recreational and commercial fishing industries that I have spoken to about the process of establishment of the South East Commonwealth Marine Reserve Network suggests that the engagement and consultation with industry leading up to its declaration in 2007 was generally constructive, and the outcomes are generally well accepted. However, it remains to be seen whether these MPAs will be able to achieve their stated primary management objective of biodiversity conservation (see below and Sections 3, 6, 7).

Since 2007, there has been a significant increase in the activity of environmental NGOs in relation to the marine bioregional planning process, and their involvement has significantly increased the uncertainty experienced by fishing industry stakeholders regarding the process. One publication was produced by the US based Pew Charitable Trust in 2008, advocating establishment of a Coral Sea Heritage Park in the eastern bioregion that encompasses a 1 million km<sup>2</sup> no-take sanctuary zone (ie. ICUN Ia) (Pew Charitable Trust 2008). The position advocated by Pew Charitable Trust originates from their international Global Ocean Legacy campaign, that aims to establish a worldwide system of very large no-take marine reserves that exclude fishing<sup>8</sup>. Their campaign in the Coral Sea is being supported by several other local marine conservation groups, and even some scientists involved with marine planning processes (Pew Charitable Trust 2008). This was despite the fact that two Commonwealth MPAs covering an area of 17,280 km<sup>2</sup> already existed in the Coral Sea Conservation Zone, namely Coringa-Herald and Lihou Reef National Nature Reserves, both of which are classified ICUN Ia (sanctuary zones). Together, these two reserves represent over 60% of the coral reef and bank area of the Coral Sea region (Diggles 2010). However, even though these substantial MPAs have been established since 1982, the advent of large scale coral bleaching at Coringa Herald and Lihou Reefs and storm damage resulting in massive losses of live coral cover (Oxley et al. 2003, 2004), provides empirical proof that closing these areas to fishing has done nothing to protect them from the main threatening processes identified by researchers working in the region, namely natural perturbations (physical damage from storms) and the projected threats related to ocean acidification and climate change (Chin et al. 2008, Diggles 2010).

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<sup>6</sup> <http://www.environment.gov.au/coasts/mpa/southeast/activity.html>

<sup>7</sup> <http://www.environment.gov.au/coasts/mpa/publications/pubs/southeast-recreational-conditions.pdf>

<sup>8</sup> <http://www.pewenvironment.org/news-room/other-resources/success-story-protecting-marine-treasures-in-the-pacific-ocean-8589942919>



While Pew Charitable Trusts' publically stated aim is to have the worlds largest MPA in the Coral Sea, they never seem to mention that it is possible to have the worlds largest MPA in the Coral Sea while still allowing fishing, nor do they mention that declaration of a large ICUN Ia category MPA will do nothing to protect the area from the key threatening processes that occur in the region. Repeated efforts by the recreational fishing sector to try and engage with representatives of the Pew Charitable Trust to discuss the possibility of finding common ground (ie. a position that does not involve a 100% closure of the Coral Sea to all fishing) have proven unsuccessful<sup>9</sup>.

The Federal Government also contributed to the increased uncertainty experienced by fishing industry stakeholders when the DEWHA cited discredited scientific literature (including studies that were originally funded by the Pew Charitable Trust) to justify its decision to declare a Coral Sea Conservation Zone in 2009 (Diggles 2010). If stakeholders are to retain confidence in a management process, it is important that governments use high quality science and demonstrate objectivity and independence at all times when analysing scientific information that informs policy decisions. Confidence in the process was further eroded and uncertainty increased when advice provided to the Government on displaced activities appeared to suggest that any rights held by key stakeholders such as the commercial fishing industry, and particularly recreational fishers, the recreational fishing industry and tourism industries, can be extinguished by the crown without the need for any compensation whatsoever (Macintosh et al. 2009).

Environmental NGOs have also funded scientific research that appears to have been considered as part of the bioregional planning process itself. A report prepared by The Ecology Centre at the University of Queensland (Possingham et al. 2009), was funded by the Pew Charitable Trust, and reportedly presented to both Pew and DEWHA in November 2010. Press releases from The Ecology Centre and The Federal Green Party were released on the same day. The Ecology Centre release claimed the report was a *"blueprint (that) provides the Federal Government with a detailed roadmap to make accurate decisions about its plans for new marine sanctuaries in the south west of Australia later this year. The Ecology Centre blueprint establishes that 50 per cent of the oceans in the south west of the country will need to be protected in a network of marine sanctuaries to minimise risks to marine life, fish stocks and ecosystems"*<sup>10</sup>.

The press release from the Greens stated: *"This report sets the benchmark that must guide the Federal Government's approach to planning in the SW marine bioregion", said Greens Marine spokesperson Senator Rachel Siewert today. "The research demonstrates that extensive marine sanctuaries are needed if we are to properly protect the biodiversity of the south west marine bioregional area. 90% of species in the south west bioregion are found no where else in the world. 50% of the world's whale and dolphin species use the area. The science shows that large marine sanctuaries need to be established in order to ensure protection of this unique biodiversity, Senator Siewert said"*<sup>11</sup>

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<sup>9</sup> <http://www.fishingworld.com.au/news/pew-won-t-budge-on-coral-sea>,  
<http://www.fishingworld.com.au/news/opinion-no-compromise>, <http://www.fishingworld.com.au/news/pew-too-busy-to-take-up-coral-sea-invite>

<sup>10</sup> <http://www.uq.edu.au/ecology/index.html?page=146340>

<sup>11</sup> <http://www.bob-brown.greensmps.org.au/content/media-release/greens-welcome-marine-sanctuary-roadmap>



Upon reading Possingham et al. (2009), it became clear how a blueprint that required 50% of the ocean in the southwest of the country to be placed in marine sanctuaries was determined. The Marxan computer model used required definition of minimum levels of representation, and on page 78 of the document, in the methods Section 5.1.4, *Levels of Representation*, subsection 5.1.4.1, *Minimum Levels of Representation*, the authors stated:

*“This has been addressed through the target setting process for the Marxan analysis with conservation feature targets set at a minimum of 30% in sanctuary as a proportion of their distribution within each bioregion, as shown in Table 5.1 below. Targets for listed species were incremented by 20% above the base level of 30%, consistent with the principles relating to features with special protection needs”*

More information was contained on page 80, in section 5.1.4.6, Output Area Achievement, where the authors stated: *“In the post-Marxan analysis, we report the solutions that result in a reserve network covering at least 30% of each bioregion”*

Now I am no expert on Marxan, but I am familiar with the workings of other models. The methods outlined in Possingham et al. (2009) appear to suggest that the Marxan model was programmed to produce results that dictated a minimum 30% of areas should be encompassed in MPAs, and that anywhere listed species of high conservation value occurred, that an additional 20% above the base level would be added on. Then only those solutions that resulted in a reserve network covering at least 30% of each bioregion were reported. Since many listed species (e.g. whales, pelagic fish and seabirds) are highly migratory, they would occur over the entire region being assessed, so it is possible the Marxan model simply added the incremental 20% figure in most ecosystems to the original 30% to give a final result that suggested 50% of the ocean in the southwest of the country “needs to be placed in marine sanctuaries”. While this may be a gross simplification of the inner workings of such a complicated model, it demonstrates that to provide realistic outputs, the model requires realistic inputs, and **it appears that the Marxan model faithfully outputted an analysis containing the same percentage areas for closure that the modellers themselves originally decided upon during the target setting process, ie. The % closure was decided before the analysis was made. This is very different to the message that was given to the public via the two press releases, which gave the impression that “The research demonstrates that extensive marine sanctuaries are needed”**. In reality, existing data was simply reviewed and plugged into a model, and a particular % “Minimum Level of Representation” was determined before the model was run. The outcomes of the analysis were then interpreted as meaning 50% of the region should be placed in ICUN Category Ia (no-take sanctuary), with no mention to the public of the possibility of multiple use scenarios encompassing other ICUN categories that still encompass very high conservation values, such as Category Ib or II.

While discussing percentages, it is notable that Penn and Fletcher (2010) stated *“Whilst simplistic solutions (e.g. all fisheries need sanctuary zones) and generic management rules (‘x’% always needs to be closed) are often promoted by lobby groups, this review suggests that they will rarely be optimal or appropriate when dealing with the management of complex, marine ecosystems and resources”*.

The reasons why particular representative numbers like 30% + 20% were chosen appear to stem from another component of the work The Ecology Centre conducted for the Pew Charitable Trust, namely development of a “Guidance Statement on Scientific Principles for Design of Marine Protected Areas in Australia” (The Ecology Centre 2009). It states “*This document represents a broad consensus of the contributed opinions of more than 40 scientists who have an active involvement in the planning and management of marine protected areas in Australia. Development of the document has been moderated by researchers from The University of Queensland’s Ecology Centre.*” It also stated that the “*principles are specifically focused on managing the uncertainty and risks inherent in designing effective and efficient MPAs in the absence of full knowledge of the biodiversity, the contemporary and developing threats, or the effectiveness of management strategies within and outside MPAs. The principles also provide a basis for MPA-based conservation to assist in maintaining the resilience of Australia’s marine populations, habitats and ecosystems in the face of the world’s changing ocean climate.*”

It is illuminating to compare this document, moderated and prepared by The Ecology Centre, under contract from the Pew Charitable Trust, to earlier documents that were produced by representative committees during the first 15 years gestation period of the NRSMPA. The latter include several documents produced by the Australian and New Zealand Environment and Conservation Council (ANZECC) taskforce that set guidelines for establishing the NRSMPA (ANZECC 1998), the strategic plan which outlined various scientific guiding principals (ANZECC 1999), and numerous other publications produced by or for the government over the previous 15 or 16 years<sup>12</sup>. Given that the documentation of the scientific principals underpinning the rollout of the NRSMPA was already very comprehensive, an interested observer might well ask why did Pew Charitable Trust see fit to ask The Ecology Centre to develop and moderate yet another, separate scientific principals document ?

Dr Gary Morgan (who is a prominent and respected fisheries scientist with decades of experience as a research director of both SA and WA State Fisheries Departments, as well as an adviser to the FAO, United Nations Environment Program, and the European Commission on Fisheries Sustainability and Marine Biodiversity Protection), may have answered this question when **he identified Possingham et al. (2009) and its supporting papers as political documents, based on flawed science. He was quoted as saying the contents of the document were extremist and, if implemented, would devastate the SA and WA fishing industries.**<sup>13</sup>

The lead author of these reports and Director of The Ecology Centre, Professor Hugh Possingham, had previously supported the Pew Charitable Trust in their efforts to close the entire Coral Sea region to all fishing as part of their international Global Ocean Legacy campaign (Pew Charitable Trust 2008). Unfortunately for Possingham, there is no rational scientific basis for establishment of such a large ICUN Ia Category MPA in that region, especially given that the area would still remain unprotected from the key threatening processes that already effect the two ICUN Category Ia National Nature Reserves that already cover 60% of the coral reef and bank area within the region (Diggles 2010). The Pew Charitable Trust’s desire for a 1 million km<sup>2</sup>, ICUN Category Ia MPA in 100% of the Coral Sea is based on a philosophical position (I.

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<sup>12</sup> <http://www.environment.gov.au/coasts/publications/index.html#nrsmpa>

<sup>13</sup> [http://media.mediamonitors.com.au/newsalert/NewsAlert\\_Order.aspx?alertid=1011150904-9a86a559-d3e3-4603-ab02-7fc36fce2c01](http://media.mediamonitors.com.au/newsalert/NewsAlert_Order.aspx?alertid=1011150904-9a86a559-d3e3-4603-ab02-7fc36fce2c01)

Zethoven, personal communication), and it is unfortunate that The Ecology Centre has chosen to support this philosophy through its Director advocating for such large closures (apparently all categorised as ICUN Ia), in not only the Coral Sea, but also now in the South West of Australia.

For some time after the release of The Ecology Centre Report (Possingham et al. 2009) it was clear (based on correspondence I received about this subject), that many stakeholders in the fishing and marine related tourism industries throughout Australia were unsure which entity was running the bioregional planning process. Such was the initial confusion surrounding the status of the so called scientific document from The Ecology Centre and its apparent simultaneous delivery to both DEWHA and the Pew Charitable Trust in Hobart in November 2010.

**These events demonstrate that considerable efforts have been made in recent times by environmental NGOs (in collaboration with a small group of supporting scientists), to try and redefine the “scientific rules” under which the NRSMPA was originally planned over the preceding 15 years.** When this and all of the other factors outlined above are considered together, it is easy to see why there is a high level of uncertainty, and even mistrust, within the fishing and marine sectors and regional tourism bodies regarding the next stages of the rollout of the NRSMPA.

## ***2 Has Australia already met its international obligations ?***

To meet the requirements for classification as a MPA, a managed area must have several key characteristics that separate it from other marine managed jurisdictions (Dudley 2008). These generally require that the MPA:

- has been established especially for the conservation of biodiversity (consistent with the primary goal of the NRSMPA)
- is able to be classified into one or more of the six IUCN Protected Area Management Categories reflecting the values and objectives of the marine protected area (Table 1)
- must have secure status which can only be revoked by a Parliamentary process

For the area to be included in the NRSMPA, it must also contribute to the “representativeness, comprehensiveness or adequacy” of the national system. It is clearly stated on the DSEWPC website, that “*all existing State and Commonwealth MPAs contribute to the NRSMPA*”, and that without declaration of any more MPAs there are already over 200 of them in Australian waters, covering approximately 88 million hectares or 10% of Australia's EEZ (excluding the Australian Antarctic Territory)<sup>14</sup>. These data suggest that Australia has already achieved substantial marine environmental conservation via MPAs to an extent that surpasses all international benchmarks. Certainly, at a national level Australia has largely achieved its international obligation under the Jakarta Mandate by fulfilling its commitment to having “*At least 10% of each of the world's marine and coastal ecological regions effectively conserved*” by 2012 (United Nations Environment Programme 2004, 2005), although establishment of MPAs that encompass at least

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<sup>14</sup> <http://www.environment.gov.au/coasts/mpa/nrsmpa/index.html>

10% of every ecosystem type remains to be achieved in some regions. As the UNEP target has now been revised to 2020<sup>15</sup>, Australia is now 9 years ahead in achieving the international target.

However, because fisheries management in Australia has a significant Government and institutional presence at both State and Federal levels, the majority of this country's coastal waters already have significant levels of Government mandated protection from fishing, either by closures or controls on the fishing methods that can directly affect marine habitats, to a degree that would be considered equivalent to those found in MPAs in other countries. Indeed, in their Government of Western Australia paper, Penn and Fletcher (2010) noted that “*about 90% of the continental shelf habitats are actually protected in practical terms*”, and that “*As a result of this comprehensive range of historical controls, marine species, marine habitats and therefore biodiversity in WA are already highly protected from negative fishery impacts compared to nearly all other locations elsewhere in the world. In effect, most of WAs continental shelf waters could already meet the IUCN Criteria IV, V, VI to be designated as MPAs in the international context.*” As fisheries management arrangements in WA are typical of those found elsewhere throughout the country, the observations of Penn and Fletcher (2010) can be extended to other States and, indeed, to most (if not all) parts of the Australian EEZ. If this wasn't enough, the huge extent of the areas for further assessment outlined in Figure 1 will mean that Australia is at the threshold of greatly exceeding its international obligations for marine conservation over the next 2 years, if the bioregional planning process continues along its current path.

Given that the DSEWPC website clearly states that over 200 MPAs already occur in Australian waters, covering approximately 88 million hectares or 10% of Australia's EEZ, it is interesting to note that the “scientific principals” document produced by The Ecology Centre (2009) stated “*Australia's progress towards establishing the National Representative System of Marine Protected Areas (NRSMPA) is falling well short of its stated goal of establishing at least 10% of each marine bioregion within MPAs by 2012*”. When seemingly contradictory statements such as these exist in supposedly authoritative documents, stakeholders and the general public could be forgiven for being a little confused. If 10% of the EEZ is already within MPAs, but we are still “well short” of our stated goals for representation of 10% of each bioregion, clearly either some bioregions are considerably over-represented at the moment, or else the public and stakeholders are being misled.

### **3 Are environmental NGOs and some governments misleading the public ?**

Despite this substantial marine conservation effort, the Australian public and fisheries stakeholders are currently being bombarded with media from environmental NGOs that suggests that the current extent of “protection” of the marine environment around the world is “less than 1%”, and that the only way to remedy the situation and “fully protect” the marine environment is to establish large MPAs in Australian waters which are equivalent to ICUN Category Ia (ie. no-take sanctuaries) during the bioregional planning process<sup>16</sup>. By ignoring the fact that Australia's marine environment is already well protected from fishing by international standards, and by suggesting that “full protection” is only given by MPAs, this message fails to inform the public

<sup>15</sup> <http://www.cbd.int/decision/cop/?id=12268>

<sup>16</sup> [http://www.amcs.org.au/WhatWeDo.asp?active\\_page\\_id=164](http://www.amcs.org.au/WhatWeDo.asp?active_page_id=164)

not only of how well Australia's marine environment is already protected from fishing, but it also ignores the multitude of other risks to biodiversity and the marine environment that are NOT addressed by MPAs (see examples in Section 1 re: MPAs in the Coral Sea, and below for other Australian MPAs). This position also fails to educate the public on the differences between destructive and sustainable fishing practices, nor does it discriminate between the various other ICUN categories besides Ia that can be used for management in MPAs to achieve conservation goals (Table 1). Indeed, this message is based on an anti-fishing philosophy and not science<sup>17</sup>, but it is nevertheless being widely promoted in a concerted fashion by several environmental NGOs in an aggressive media campaign with a message that is so simplistic, it acts mainly to mislead a largely ignorant public by failing to even begin to educate them on the multitude of issues and complexities surrounding marine environmental management in today's world.

As an aquatic animal health specialist, I study the actual mechanisms that directly influence resilience and biodiversity within aquatic ecosystems. In other words, I study the nuts and bolts that hold these ecosystems together. The mechanisms I am talking about include relationships between water quality, habitat and organism health, trophic ecology, energy and nutrient flow, microbial processes, predation and parasitism, disease, pathological and biochemical alterations, immunosuppression, reproductive dysfunction, and so on. These are the mechanisms and processes that directly influence biodiversity and tie aquatic ecosystems together, and these are the very nuts and bolts that are being largely overlooked or ignored when ecological motherhood statements are used by environmental NGOs and some scientists to justify large no-take MPAs.

While advocacy from environmental NGOs is not new, a worrying trend is the fact that this perception that MPAs are the only way to provide "full protection from everything" has also permeated some government departments. Professor Robert Kearney touched on some of these issues in his examination of the documents used by the NSW Marine Parks Authority to underpin declaration of the Batemans Bay Marine Park (Kearney 2007). A more recent case study came in late 2010 in a press release from the QLD Government's Minister for Climate Change and Sustainability, relating to the Moreton Bay Marine Park (Appendix 1). The headline was that "*Marine life is thriving in Moreton Bay green zones*". The press release described how increased numbers of male mud crabs above the minimum legal size in sanctuary zones in Moreton Bay showed the sanctuaries were "working", and that "*We expect these levels will lead to greater numbers of fish and crabs moving outside of the green zones*", suggesting that a spillover or increased recruitment effect may ensue, as hypothesized by researchers from The Ecology Centre, the University of QLD (Pillans et al. 2005). **However, the reality is, this sort of research only proves the obvious, that "no fishing" occurs in the sanctuary zones.**

The fact that all female mud crabs are already protected in QLD (i.e. no take), and that the minimum legal size of 15 cm carapace width for male mud crabs is well above the size of first maturity (male crabs mature at around 9-11 cm, see Knuckey 1996), means that all female mud crabs have ample opportunity to be fertilized by males before they move out into the bay to spawn (Heasman 1980). This suggests we can expect minimal or even zero increase in productivity of mud crabs from the increased sanctuary zone areas in Moreton Bay. This is because female mud crabs are already fully protected by law in QLD, and the sanctuary zones are likely to do nothing to boost the numbers of their eggs or improve the survival of the larvae

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<sup>17</sup> I. Zethoven, personal communication to Ben Diggles, c. 2008.

they produce, especially as female mud crabs carrying eggs feed at much lower frequencies and therefore do not tend to enter traps (Heasman 1980, Heasman et al. 1985).

This press release demonstrates a staggering lack of understanding by Government authorities in QLD, and some researchers, of the limits of the utility of sanctuary zones for fisheries and biodiversity enhancement. This misunderstanding is largely based on what Penn and Fletcher (2010) identified as “*misconceptions about the dynamics of fished stocks and a lack of appreciation of the dispersal and recruitment processes for marine species generally*”. Mud crabs live for only 3 or 4 years (Heasman 1980), hence the existence of adult individuals in sanctuary zones will always be temporary. Recruitment of mud crabs is therefore the key to their persistence, and a much better measure of the “effectiveness” of these sanctuary zones would be measurement of the numbers of juvenile male and female crabs within them, because increased numbers of undersized crabs would indicate increased recruitment was occurring, ie. improved survival of mud crab eggs and larvae. However, because egg and larval survival in mud crabs is dictated by water quality (Vijayavel and Balasubramanian 2008), and habitat quality and availability will also determine the number of mud crab recruits, it suggests that the current highly conservative fisheries management arrangements in QLD are adequate to maximise productivity for mud crabs, especially in view of the degraded environmental conditions in Moreton Bay.

In fact, researchers have recorded a widespread and sustained collapse of macrobenthic infauna (97.5 % reduction in abundance since 1970’s) in Moreton Bay (Quinnell et al. 2004), as well as significant dieback of key habitats such as seagrasses (Kirkman 1976, Lee Long et al. 2000), mangroves (Duke and Haller 2009), and oyster reefs (Ogburn et al. 2007, Beck et al. 2011, Diggles 2011). These environmental problems have significantly reduced food and habitat availability for mud crabs in a manner far more likely to have long term detrimental impacts on mud crab populations than fishing for adult male crabs above a 15 cm carapace width minimum size. These exact same environmental problems also explain why researchers from The Ecology Centre found no statistical difference in nekton species richness (= fish biodiversity) between areas in Moreton Bay open and closed to fishing (Pillans et al. 2007). Certainly, they observed large seasonal variations in fish biodiversity, and commercial net fishing did reduce fish species “evenness”, but the highest fish biodiversity recorded in their report occurred in the recreational only fishing area in Pumicestone Passage, not the sanctuary zone (Pillans et al. 2007). Yet, Pillans et al. (2007) concluded that their study “*demonstrates that the small marine reserves in Moreton Bay are protecting marine biodiversity*” and that “*we expect that the reserves in Moreton Bay are too small to have a substantial positive impact on biodiversity*”.

**But without any historical baseline study of biodiversity prior to establishment of the marine reserves (Pillans et al. 2005), there is no way that these researchers could “demonstrate the reserves protected biodiversity” at all. Pillans et al. (2007) therefore had no scientific basis to “expect” that the sanctuary zones in Moreton Bay needed to be larger before they could show they had any real effect on biodiversity.** Nevertheless, this unfounded assertion by The Ecology Centre researchers was used by them, environmental NGOs and the QLD Government to justify increasing the size of no-fishing sanctuary zones during the subsequent rezoning of the Moreton Bay Marine Park. Never at any stage did these researchers appear to consider the most plausible explanation for their results – namely that biodiversity in



all areas was being adversely (and severely) affected by environmental degradation due to poor water quality stemming from adjacent land use and urbanization, as demonstrated by the aforementioned loss of macrobenthic fauna, seagrasses, mangroves, and oysters, including losses of all these in areas of Pumicestone Passage where Pillans et al. (2005, 2007) conducted a significant proportion of their studies (Diggles 2011, Figure 2).



**Figure 2. Decades old oyster clumps at the mouth of Pumicestone Passage, Moreton Bay Marine Park, in January 2011. The formerly monolithic structures are now mushroom shaped, as they decay from the bottom up due to oyster death and spatfall failure due to declining water quality. A rare visible indicator of larval recruitment failure in the marine environment.**

Indeed, kills of fish, crabs and bivalves are now common in the Moreton Bay Marine Park (Diggles 2009), and significant fish kills have also recently been reported in sanctuary zones within the Jervis Bay Marine Park in NSW<sup>18</sup>. Kills of adult fish, crabs and oysters are just visible “tip of the iceberg” stuff, classic telltale signs of declining environmental quality. When adults can’t survive, the unseen mortality of egg and larval stages is enormous and not at all “natural”. In 2009 the Moreton Bay ecosystem received its lowest rating ever, a “D” in the local “Healthy Waterways” Ecosystem Health Monitoring Programme. “D” denotes “*Poor, meaning*

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<sup>18</sup> <http://www.fishingworld.com.au/news/brown-fish-kill-highlights-real-problem>



*many key processes are not functional and most critical habitats are severely affected*<sup>19</sup>. One of the first key ecological processes that is rendered non-functional by declining water quality is recruitment of fish and invertebrates, because it relies on survival of sensitive larval stages. Death of larval stages in the marine environment is invisible, and out of sight is out of mind. However, declines of historic, decades old rock oyster clumps (Diggles 2011, Figure 2) provide rare visual evidence that this process of recruitment failure is actively happening in the Pumicestone Passage where Pillans et al. (2005, 2007) conducted their studies.

The biological and ecological reality of the situation in the Moreton Bay Marine Park is that the “Healthy Waterways” ecosystem health monitoring programme is the most accurate indicator available of the true condition of Moreton Bay in comparison to historical baselines. Because the “Healthy Waterways” results are also publicly available, the media release from the QLD Government stating that “*Marine life is thriving in Moreton Bay green zones*” simply gives the public mixed messages about the real threatening processes to environmental health in Moreton Bay and exaggerated impressions of the benefits (if any) that are likely to flow from establishment of no fishing “sanctuary zones” in an environment which is being degraded. This is an especially important point in light of recent flooding of the Brisbane River in January 2011 that contributed to further significant declines in water quality and associated biodiversity loss, including continuing historical dieoffs of critical ecosystem engineers such as seagrasses, bivalves and benthic infauna.

**To put all of this in laymans terms, the terrestrial equivalent of the Moreton Bay Marine Park would be establishment of a national park on a garbage dump. Science shows that some of the nuts and bolts holding the Moreton Bay Ecosystem together are already missing, while others are very loose and will soon fall off unless something is done about water quality in the area.** Those planning MPAs in other regions of Australia where environmental conditions may also be declining should take careful note of these precedents, and especially the impotence of MPAs to “protect biodiversity and ecosystem resilience” under these circumstances. We don’t want MPA planners using “band-aids” to try to cure a cancer.

In summary, contrary to what environmental NGOs, some researchers and the QLD Minister for Climate Change and Sustainability want the public to think, MPAs are no panacea for marine conservation and management. The revised sanctuary zones in Moreton Bay are likely to have no effect whatsoever on overall productivity of mud crab populations, because the mud crab fishery is already very well managed using conservative conventional fisheries management techniques, and the MPA does not address the underlying mechanisms responsible for biodiversity loss within the ecosystem. Indeed, under current arrangements it is very likely that populations of fish, crabs, bivalves and other organisms in Moreton Bay, including those in sanctuary zones, will continue to decline from historical levels independent of fishing, in line with the ongoing gradual degradation of their habitat and food sources, unless water quality declines in Moreton Bay Marine Park are addressed and reversed. Researchers monitoring the performance of MPAs in other stressed ecosystems (Jones et al. 2004, Page et al. 2009) have also noted a similar impotence, confirming that MPAs established in degrading environments fail to protect the essential ecological processes that underpin biodiversity and ecosystem resilience.

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<sup>19</sup><http://www.healthywaterways.org/EcosystemHealthMonitoringProgram/2010ReportCardResults/CatchmentResults/MoretonBayCatchments/MoretonBay.aspx>

Penn and Fletcher (2010) also noted that there are several basic misunderstandings of the efficacy of MPAs that continue to be propagated by environmental NGOs. More recently, the seafood sector uncovered evidence that some aspects of the Sustainable Seafoods Guide released by the Australian Marine Conservation Society (AMCS)<sup>20</sup> were so inaccurate that the guide risked misleading the Australian public (Ruello 2011). Kearney (2007) found similar problems with the literature cited by the NSW Marine Parks Authority in their “science paper” for the Batemans Bay marine park. It is very unfortunate that this misleading and divisive behaviour is occurring, because environmental NGOs and the fishing industry have much in common in relation to their joint desires for improvement of water quality and protection of habitat and the various trophic levels within aquatic environments that underpin healthy populations of fish, invertebrates and other marine animals.

#### **4 Some overseas examples of recently established MPAs**

Several governments around the world are establishing MPAs under the Jakarta Mandate or otherwise. It appears prudent, then, to briefly summarise some of the developments that have happened overseas in recent times, to observe the international context within which Australias current marine bioregional planning process is taking place.

##### **4.1 Marianas Islands National Marine Monument (US jurisdiction)**

The Marianas Islands National Marine Monument was declared by the Bush Administration under the Antiquities Act of 1906 in proclamation 8335 in January 2009.<sup>21</sup> The MPA covers an area of 246,000 km<sup>2</sup> along the eastern side of the Northern Marianas Islands, including Guam, around 2250 km south of Japan. The Pew Charitable Trust lobbied for its establishment as a large sanctuary area (ICUN Category Ia) as part of its Global Ocean Legacy program<sup>22</sup>. However, after scientific appraisal and negotiations with all stakeholders the monument was declared as an equivalent to ICUN Categories Ib or II (it does not yet appear to be formerly classified), whereby commercial fishing and other extractive activities are excluded, but sustainably managed recreational and traditional fishing are specifically allowed (Western Pacific Regional Fishery Management Council (WPRFMC) 2010a, 2010b). Other activities that are specifically permitted include scientific research (including research involving fishing) and military activities (Appendix 2). Some residents of the Marianas have observed that the Pew Charitable Trust were not very happy with this decision<sup>23</sup>, and continue to lobby the US Government to remove all fishing from the area. Some commentators have also suggested that invoking the Antiquities Act, particularly in the fashion that was exercised by the Bush Administration with regard to the Marianas and the Pacific Monuments (see below), was “*an inefficient, haphazard way to correct poor fisheries management or to effect conservation, as well as an undesirable way to establish MPAs*” (Laemmle 2010).

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<sup>20</sup> <http://www.sustainableseafood.org.au/>

<sup>21</sup> <http://georgewbush-whitehouse.archives.gov/news/releases/2009/01/20090106-2.html>

<sup>22</sup> <http://www.pewenvironment.org/news-room/other-resources/success-story-protecting-marine-treasures-in-the-pacific-ocean-8589942919>

<sup>23</sup> <http://www.saipantribune.com/newsstory.aspx?cat=15&newsID=90204>

## 4.2 Pacific Remote Islands and Rose Atoll Marine National Monuments (US Jurisdiction)

In January 2009, the Bush Administration also issued proclamations 8336 and 8337 establishing MPAs in the Pacific Remote Islands region surrounding the Wake, Johnston, Jarvis, Howland, Baker, Kingman, Palmyra and Rose Atolls in the Central Pacific (Laemmle 2010, WPRFMC 2010b). Commercial fishing was excluded from a 50 nautical mile radius surrounding each island, while non commercial fishing (sustenance, subsistence, traditional, indigenous and recreational) was permitted in all areas, except for a no-take sanctuary (equivalent to ICUN Category Ia) within 12 nautical mile radius of Rose Atoll (WPRFMC 2010b). Recreational charter-for-hire fishing was permitted in all areas (except the Rose Atoll sanctuary) under a permit and logbook arrangement with their catch not permitted to be marketed for sale, or even for customary exchange in some jurisdictions (WPRFMC 2010b).

## 4.3 Chagos Marine Protected Area (British Indian Ocean Territory)

The Chagos Marine Protected Area in the British Indian Ocean Territory (BIOT), covering around 544,000 km<sup>2</sup>, was designated as the world's largest MPA in April 2010, and all commercial fishing in its waters ended in October 2010<sup>24</sup>. The Pew Charitable Trust lobbied for the establishment of the area as part of its Global Ocean Legacy program, and after the MPA was declared, stated on their website that *“These accomplishments mark a historic victory for global ocean conservation, and provide a protected refuge and breeding site for migratory and reef fish, marine mammals, birds, turtles, corals and other marine life”*.<sup>25</sup> Nevertheless, it is noted that recreational fishing remains permitted in the Chagos MPA, in the only areas it occurs near the US military base at Diego Garcia (Charles Clover, Personal Communication to Martin Salter, January 24, 2011), suggesting that the MPA likely meets ICUN Category Ib or II.

However, diplomatic cables leaked from the US Embassy<sup>26</sup> in late 2010 by Wikileaks demonstrated that the Chagos MPA was, in fact, established primarily for military purposes in order to restrict access and reduce the likelihood of former native inhabitants of the Chagos Archipelago (Chagossians) being able to return to the region after they were forcibly removed to make way for the military base (US Embassy 2009). Establishing a marine reserve in the BIOT was considered to *“be the most effective long-term way to prevent any of the Chagos Islands’ former inhabitants or their descendants from resettling in the BIOT”* (US Embassy 2009). The leaked cable also disclosed observations by diplomats that *“the establishment of a marine reserve would require permitting scientists to visit BIOT, but that creating a park would help restrict access for non-scientific purposes. For example, he continued, the rules governing the park could strictly limit access to BIOT by yachts, which Roberts referred to as “sea gypsies”* (US Embassy 2009).

The leaked cable provided support and vindication for earlier observations from independent analysts who suggested that the declaration of the Chagos MPA was an example of fortress

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<sup>24</sup> <http://protectchagos.org/blog/chagos-becomes-a-no-fishing-zone/>

<sup>25</sup> <http://www.pewenvironment.org/campaigns/global-ocean-legacy-chagos/id/8589940399>

<sup>26</sup> <http://www.guardian.co.uk/world/us-embassy-cables-documents/207149>

conservation at sea (DeSanto et al. 2010). This was due to the fact that the British Government proceeded with designating the area whilst the European Court of Human Rights was deliberating the right of native Chagossians to return to the island (DeSanto et al. 2010). In addition, DeSanto et al. (2010) noted that the scale of the area poses significant management and enforcement challenges, which had not necessarily been taken into consideration in the rush to establish such a large no-take MPA. DeSanto et al. (2010) also noted that the declaration of the Chagos MPA was an example of the type of activities that may occur more frequently from signatories to the Jakarta Mandate in the runup to the 2012 (now 2020) deadline for the establishment of a global 10% (minimum) network of MPAs (The British Government is a signatory to the convention). Santos et al. (2010) also considered that *“it is worth reflecting on the recent rush for ‘bigger is better’ and ‘no-take is best’ designations<sup>27</sup> that lack clear management and enforcement frameworks, as well as related implications for the access and benefit sharing provisions of the Convention for Biological Diversity.”*

Indeed, the various issues highlighted by Santos et al. (2010) are all worth serious consideration by decision makers globally, especially if the rush to declare MPAs before international deadlines results in widespread “fortress conservation” policies, unjustified access restrictions and even possible human right violations. The vast size of the Chagos MPA will no doubt be challenging for the British Government to manage, given the remote location (Santos et al. 2010), especially considering the fact that the marine parks authorities in Victoria (Parks Victoria), with much easier access and less than 1% of the area to manage *“could not demonstrate that it is effectively managing MPAs or that it is being effective or efficient in protecting marine biodiversity within MPAs* (Victorian Auditor General 2011).

## **5 Fortress conservation or adaptive management ?**

By way of further background, the term “fortress conservation” was initially coined to describe authoritarian conservation activities, such as those which resulted in the displacement of Maasai from the Mkomazi Game Reserve in Tanzania (Brockington 2002, 2004). The basic tenet behind the theory of fortress conservation is that it is OK to inflict and promote injustices on locals and/or indigenous peoples with the complicity of Government and the support of international conservation bodies, provided that the conservation objectives are achieved, because indigenous peoples *“have been forcibly removed from their lands and violently treated for hundreds of years, why should injustices perpetrated by conservation be any different”* (Brockington 2004).

Brockington (2004) comments further on how fortress conservation “gets the job done”. *“All societies distribute misfortune unequally, the least powerful people tending to experience it the most. Misfortunes inflicted by protected areas can be concentrated upon a minority, who in their weakness and want of numbers are unable to do anything effective about it. In such situations, even if the protected area generates few benefits, the unaffected majority can ignore the harm it does.”* There are quite a few people in the commercial and recreational fishing industries in Australia at the moment who would understand what Brockington (2004) is talking about here.

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<sup>27</sup> <http://www.pewenvironment.org/campaigns/global-ocean-legacy/id/8589941025/>

In contrast to the fortress conservation method used to achieve “*a historic victory for global ocean conservation*” by establishment of the worlds newest and largest MPA, alternatives likely to be far more palatable to Australians should instead encourage increased stakeholder involvement in the management process. Indeed, authoritarian fisheries management and conservation activities have been poorly accepted in many countries, and particularly developing countries, usually because they threaten cultural and socio-economic activities, food security, and conflict with traditional management methods (Johannes 1978, DeSanto et al. 2010). For example, MPAs with large areas permanently closed to fishing are often not well accepted in Pacific Island communities, resulting in lack of compliance (Bartlett et al. 2009a), but smaller (c. 1 km<sup>2</sup>) permanently closed areas are increasingly becoming accepted again at scales related to individual villages (Bartlett et al. 2009b) in a manner similar to traditional reef and lagoon tenure (Johannes 1978). Of significance to the current MPA debate in Australia is the fact that periodic closures (a form of adaptive management which do not seem to be part of the Australian MPA toolbox) have traditionally been used in the Pacific Islands to meet social, cultural, or conservation goals (Johannes 1978, 1998), and this form of adaptive management is well accepted, requires little data to implement, and has more or less successfully managed marine resources for centuries (Johannes 1978, 1998, Bartlett et al. 2009a). However, in many instances, traditional management has broken down as traditional societies became westernized (Johannes 1978). Under these circumstances, because developing nations in general tend to otherwise have rather rudimentary fisheries management arrangements (compared to western benchmarks), often massive improvements in ecological protection are realized when even the most basic fisheries management principles are borrowed from the western world and implemented (Cinner et al. 2009).

Indeed, from both an ecological and fisheries management perspective, establishment of a no-take sanctuary zone is virtually identical to implementing very conservative size limit regulations (Botsford et al. 2003). This is why effective conventional fisheries management essentially achieves protection at least equivalent to IUCN Categories IV, V, and/or VI (Penn and Fletcher 2010), and why more sophisticated fisheries management techniques used for some recreational fisheries (such as no-take-away wilderness fishing zones and catch and release management areas), are equivalent to ICUN Categories Ib, II and even Ia for marine protection. An example of the latter is the existence of a catch and release bonefish fishery in the Palmyra Atoll National Wildlife Refuge (Friedlander et al. 2008). **Given that a population of only 300,000 bonefish underpins a catch and release sportfishery in Florida worth one billion US dollars to their economy annually (Ault et al. 2008), governments in Australia would be very silly if they did not consider these opportunities for adaptive management of recreational fisheries that allow them to have their “conservation cake”, whilst eating it too by realizing the significant socio economic benefits that arise from well managed recreational fisheries.**

Another example of sophisticated ecological management involving a recreational fishery in a developed nation is a form of co-management employed in the worlds oldest national park, namely Yellowstone National Park in the USA. Yellowstone was first established in 1872, and today the park meets ICUN Category II.<sup>28</sup> The notable point about Yellowstone is the fact that it boasts a vibrant and healthy recreational sportfishery, which has existed for nearly 140 years

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<sup>28</sup> [http://www.unep-wcmc.org/protected\\_areas/categories/eng/ex-ii.pdf](http://www.unep-wcmc.org/protected_areas/categories/eng/ex-ii.pdf)



since the parks inception. According to the official Yellowstone National Park website, “*Fishing has been a major visitor activity (in the park) for well over a century. Because of this history, fishing continues to be allowed and can complement, and in some cases even enhance, the park’s primary purpose to preserve natural environments and native species*”.<sup>29</sup> The enhancement component of this relationship stems from the prominent role recreational anglers play in habitat restoration, research and conservation of threatened species and management of exotic pest species in the park.<sup>30</sup>

Environmental extremism in the form of fortress conservation may be considered acceptable by some environmental NGOs, and this might still be the only way forward in some developing countries with weak governance and little or no fisheries management. But in Australia this approach is unnecessary, and indeed likely to be rejected as unacceptable by the majority of Australians. **Marine conservation in a developed country with strong governance and effective fisheries management means “all or nothing” management arrangements are simply not necessary.** This is why a moderate approach to establishment of the NRSMPA is suggested, so that the resulting MPAs can be based on sound science, identification and prioritisation of the various risks to the marine environment, and proper stakeholder consultation and engagement. I think a pragmatic approach to MPA implementation that maximizes stakeholder involvement during the NRSMPA process and embraces adaptive and/or co-management arrangements after the zoning is completed (as has been done recently in many other countries) will ultimately be a more effective arrangement most likely to achieve the NRSMPA conservation objectives. The alternative to this seems to be a process that advocates rigid adherence to philosophical positions on achievement of large percentages of the environment captured within IUCN Category 1a MPAs, an approach that has proven to alienate fisheries and marine tourism stakeholders in Australia that rely on sustainable access to the marine environment for their cultural and socio-economic well being.

## 6 *Are small IUCN Category Ia sanctuary zones sufficient ?*

The NRSMPA process aims to include some “highly protected” areas (IUCN Categories I and II) in each bioregion. No one disputes that the community wishes for some areas with Category Ia designation (no-take sanctuary zones) to be set aside as scientific benchmarks, but the tricky questions still remain, namely **how big do these Category Ia areas need to be, and where should they be placed ?** The IUCN Guidelines do not have any absolute requirement for size, apart from the area being sufficient to accomplish the principal objectives of management (World Commission on Protected Areas (WCPA) 2000). DeSanto et al. (2010) noted that the current emphasis on large sanctuary zones being promoted by environmental NGOs and some scientists risks promoting an “all or nothing approach” to protection of aquatic environments. “*An exclusionary fortress approach to conservation as implemented via no-take MPAs raises equity concerns regarding ‘access’ as well, in this case to marine living resources. It is this ‘all or nothing approach’ that alienates stakeholders and breeds fear and mistrust towards MPAs*” (DeSanto et al. 2010). This is exactly what has happened in Australia with fisheries stakeholders. They feel alienated by the current emphasis on large sanctuary zones that is being

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<sup>29</sup> <http://www.nps.gov/yell/planyourvisit/fishing.htm>

<sup>30</sup> [http://www.nps.gov/yell/naturescience/fishing\\_ecology.htm](http://www.nps.gov/yell/naturescience/fishing_ecology.htm)

promoted in the media by environmental NGOs who support their claims with their own dubious research. **Widespread implementation of large ICUN Category Ia sanctuary zones is typical of a fortress conservation approach one might expect from a banana republic with weak governance, rudimentary or no fisheries management, an international deadline to meet, and government officials unduly influenced by the activities of environmental NGOs.**

Indeed, advocacy for a shift to an “all or nothing approach” to protect aquatic environments in Australia borders on the absurd, especially when you consider that Australia has effective fisheries management that provides the majority of the EEZ with ecosystem protection consistent with IUCN Categories IV, V, and/or VI (Penn and Fletcher 2010). Nevertheless, Laemmle (2010) observed that *“because achievement of sustainable fishing is a somewhat complicated science, it is much easier for Government to completely ban fishing than dedicate itself to extensive scientific study to ensure that the interests of conservationists and fishermen can coexist”*. But while it may be the “easy out option”, there are several drawbacks to an “all or nothing” approach that incorporates large fishing bans. These drawbacks make it clear that moderation with sanctuary areas is the key, and that there is much, much more to marine conservation than drawing lines on maps and locking up large areas of ocean from all fishing.

Perhaps the most compelling case for limiting the size of sanctuary zones is that as their size increases, the remaining fishing is redistributed into smaller and smaller areas. Advocates of large sanctuary zones state that they end up containing more adult fish that spawn more eggs, and that a “spillover effect” is “bound to occur”, resulting in recruitment of additional larvae or juveniles/adults from sanctuary areas into adjacent areas open to fishing. However recruitment in marine species which broadcast spawn larval stages is usually independent of the number of adults over a wide range of population sizes (Johannes 1978) such that the increased spillover theory only holds for extremely overfished populations that are “recruitment overfished”. In other words, for sanctuary zones to have substantial benefits for an ecosystem, fishing must be a key threatening process to the particular ecosystem in question. At this point it is pertinent to point out that suggestions by some scientists that overfishing alone is the one threatening process that has caused massive environmental changes (Jackson et al. 2001), are greatly overstated (Boesch et al. 2001). In many cases, overfishing has either followed on after “natural” mortality increased due to habitat degradation and pollution, such as for herring affected by the Exxon Valdez oil spill (Thorne and Thomas 2008), or both processes proceeded simultaneously (Boesch et al. 2001). Indeed, habitat degradation and pollution are primarily responsible for significant ongoing reductions in fisheries productivity in many parts of the world where pollution and/or human development has occurred (Thorne and Thomas 2008; Rochette et al. 2010).

The spillover theory also assumes that the additional eggs and larvae that may be spawned from adult fish in the MPA “must survive”. However, this is a big assumption that is violated wherever environmental degradation occurs (see examples from Moreton Bay Marine Park in Section 3). Indeed, recruitment failure can occur in the absence of fishing if habitat and water quality are sufficiently degraded, because the eggs or sensitive larvae die before they settle (Figure 2), or juveniles that manage to settle do not survive because they succumb to disease, cannot find adequate food or cannot shelter from predators. Because of these reasons, in jurisdictions where fishing is already well managed there are *“few species with breeding stock levels that are reduced to a point where the increased egg production generated from a general*



*sanctuary zone is likely to measurably improve their recruitment. Consequently, (MPAs) will probably not improve the quality of fishing within other areas of the coast and, if not managed appropriately, the re-direction of fishing effort removed from new sanctuary areas could in some cases reduce the local abundance of species in nearby areas” (Penn and Fletcher 2010).*

The main drawback from this is obvious, when fishing is concentrated into smaller and smaller areas, the exploited species (and hence wider ecosystem) outside the MPA begins to suffer, and connectivity between the remaining sanctuary areas decreases, a process that if allowed to continue results in protected “islands” of higher biodiversity (assuming no pollution) that are surrounded by a “sea” of low fish production (Buxton et al. 2005, AMSA 2008). An “all or nothing” condition starts to eventuate. Evidence that this may already be happening in Australia has come from a study near Ningaloo Marine Park in Western Australia. There, populations of spangled emperor from the fishery in the North Gascoyne (which includes the Ningaloo Marine Park, containing 30% sanctuary areas) are showing signs of overexploitation, while populations of the same species in the adjacent South Gascoyne region (which is managed using conventional fisheries management techniques), remain in good condition (Marriott et al. 2010). It is very possible that concentration of fishing into the remaining 70% of the marine park has been detrimental to populations of spangled emperor in those regions. Any contribution to the fishery from the fish that remain in the 30% sanctuary area of the marine park (via spillover) is not obvious, very hard to quantify, so must be ignored by fishery managers (Marriott et al. 2010).

The upshot of all of this is, if large no- take sanctuaries are implemented in a fishery that was originally well managed in a conventional manner, the fishing in the areas that remain open will subsequently have to be managed even more tightly than they were previously to avoid an “all or nothing” situation developing. This leads to a “double whammy” situation for the commercial and recreational fishing industries that is seldom discussed. Obviously this is one good reason why moderation should be exercised when applying ICUN Category I and II criteria during MPA planning processes. This is also why Penn and Fletcher (2010) stated *“there is a rational basis to support the establishment of marine sanctuary areas where they have clear, measurable objectives that relate to achievable benefits for tourism, biodiversity and other ‘no-take’ outcomes. There is, however, little scientific basis within the WA context to support their justification where they are proposed as a precaution against undefined and hypothetical ‘bad practices’ in the management of fisheries.”*

## **7 Will the Commonwealth be able to manage such a large MPA network ?**

A second drawback of establishing MPAs with large sanctuary zones is the risk that management agencies will be unable to manage them effectively without wide stakeholder acceptance. This, together with the third drawback which relates to an increased likelihood of reduced stakeholder and community acceptance of the sanctuary zones as they get bigger, can result in establishment of “paper parks” where the lines are drawn on maps, but no management is being effected by the management agencies involved due to non-compliance. DeSanto et al. (2010) noted that the management and enforcement challenges increase with the scale of the MPA, and that these crucial details have not necessarily been taken into consideration in the rush to establish large MPAs before the original 2012 (now 2020) deadline. Indeed, it is worth noting that the ability of

administrators of some of the State MPAs in Australia to meet their management objectives has not held up under official scrutiny. The verdict of the Victorian Auditor General (2011) relating to administration of MPAs in Victoria was scathing. The Auditor General report states “*Parks Victoria could not demonstrate that it is effectively managing MPAs or that it is being effective or efficient in protecting marine biodiversity within MPAs. An absence of regular risk assessment review, detailed action plans and a lack of evaluation—both of management plans and activities—undermine planning at the park level. Parks Victoria has not reviewed its MPA risk assessments since 2005, and it therefore has no reliable basis to judge whether the risks identified then remain current, and whether their respective risk ratings still apply*”.

The Victorian Auditor Generals report did not even attempt to measure the performance of Victorian MPAs in relation to their management objectives for biodiversity protection, but if a similar audit examined the state of the environment in Moreton Bay Marine Park as well as several others, we would have many more “fail” result on our hands. So at this stage it is worth reminding the Federal Government that one of the conditions for application of ICUN protected area management categories is possession of the ability to manage them. **The World Commission on Protected Areas (2000), in its discussion on the eligibility for classification as a protected area, states as such in section 3.2.4, that “The designated management authority should be capable of achieving the management objectives”**

**The Federal Government must consider the warnings of DeSanto et al. (2010), and note the findings and conclusions of the Victorian Auditor General (2011), to ensure that in rolling out the NRSMPA, it does not bite off more of the Australian EEZ than it can chew.** Indeed, the department responsible for management of these areas will need very significant funding on a permanent basis for staff resourcing and enforcement, not to mention bottom up support from stakeholders, if it is to successfully achieve the stated management objectives for the NRSMPA. It will certainly not be possible to run these parks from a desk in Canberra. When all of these factors are considered, it becomes obvious that the Federal Government needs all stakeholders to buy into the process, which means a moderate and pragmatic approach to the roll out of the NRSMPA appears necessary if success is to be achieved.

If a pragmatic risk based management approach is taken that identifies the complete range of risks to biodiversity and ecosystem resilience, and then manages them on a prioritized basis, relatively small ICUN Category Ia zones set aside primarily for research will be more than adequate to meet the conservation objectives of the NRSMPA. Combine these with effective fishery management delegated to the professionals in the various State Fisheries Departments, the (no doubt) limited resources that will be available for MPA maintenance can then be better directed at addressing the most significant processes threatening biodiversity and ecosystem resilience, which are likely to be water quality related, such as runoff threatening coastal and offshore environments with pesticides, herbicides and sediment (McCulloch et al. 2003, Bainbridge et al. 2009, Lewis 2009a, 2009b), eutrophication and chemical pollution from sewage outfalls (Bailey et al. 2000), and so on. These processes are insidious and can result in habitat degradation even many km offshore (Lewis 2009a, 2009b). And lets not forget the threats from shipping, whether they be collisions with fauna, reefs, or oil/fuel spills, illegal fishing by foreign and local vessels, seismic surveys and other geological exploration/exploitation activities, or the significant biosecurity threats of introductions of exotic species and diseases via ballast water. There will certainly be plenty for the parks authority to do, resources will be limited, so they will

have to maximize stakeholder co-operation to make it all work. And indeed, I predict that fisheries stakeholder co-operation would be forthcoming, provided they retain fair and reasonable access, are adequately compensated for any losses, and observe that genuine efforts are being made by the park authorities to combat these various other threats to biodiversity. Sounds great, but the skeptical reader may well ask, are there any real examples that can be given to show such a marine conservation nirvana is possible ?

As an example of what can be done when a genuine co-ordinated ecosystem-based management approach is undertaken with stakeholder co-operation, we need look no further than the model provided by the various components of the Chesapeake Bay Restoration Program<sup>31</sup>. Chesapeake Bay is a large coastal ecosystem on the east coast of the USA which faces virtually identical problems and challenges to those I have previously described as being encountered in the Moreton Bay Marine Park. However, in contrast to the situation in Moreton Bay, where the marine conservation emphasis has been on expanding the MPA and its sanctuary areas, the Americans have gone about tackling the same problems in a very different way, using a risk based management approach that has identified and prioritized the difficult process of tackling the main threatening processes to the ecosystem. The 5 main components of the restoration program include reducing pollution<sup>32</sup>, restoring habitats<sup>33</sup>, managing fisheries<sup>34</sup>, protecting the catchment<sup>35</sup>, and education aimed at fostering public stewardship of Chesapeake Bay<sup>36</sup>. Each component of the program has goals that the stakeholders have agreed upon and aim towards, striving for improvement year on year. The whole program is done virtually without area management or full no-take sanctuary zones, though taking oysters is prohibited in those areas where oyster reef restoration is being undertaken, because the oysters are being used mainly for their ecosystem engineering benefits to the environment, rather than as a fishery (Chesapeake Research Consortium 1999, Schulte et al. 2009).

So on one hand in the USA (a country which did not even ratify the Jakarta Mandate) we have stakeholders working towards agreed prioritized conservation and rehabilitation goals that focus on tackling the actual mechanisms of degradation that represent real threats to vital ecosystem functions. On the other hand, in Australia (where we have ratified the Jakarta Mandate and are required to reach certain percentages of MPAs by certain deadlines), the management emphasis has been on establishment of marine parks, which in Moreton Bay has simply lead to one section of the government measuring declining water quality that equates to massive ecosystem dysfunction and loss of biodiversity and fisheries productivity, while at the same time the Minister and environmental NGOs are trying to justify the expansion of the MPA by misleading the public that the sanctuary zones are somehow protecting the environment and allowing the marine animals living in Moreton Bay to thrive. While the problems are the same, the contrasts between the solutions being used in Chesapeake Bay and Moreton Bay could not be more stark.

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<sup>31</sup> <http://www.chesapeakebay.net/restrtn.htm>

<sup>32</sup> [http://www.chesapeakebay.net/status\\_reducingpollution.aspx?menuitem=19691](http://www.chesapeakebay.net/status_reducingpollution.aspx?menuitem=19691)

<sup>33</sup> [http://www.chesapeakebay.net/status\\_restoringhabitats.aspx?menuitem=19696](http://www.chesapeakebay.net/status_restoringhabitats.aspx?menuitem=19696)

<sup>34</sup> [http://www.chesapeakebay.net/status\\_managingfisheries.aspx?menuitem=19716](http://www.chesapeakebay.net/status_managingfisheries.aspx?menuitem=19716)

<sup>35</sup> [http://www.chesapeakebay.net/status\\_protectingwatersheds.aspx?menuitem=19720](http://www.chesapeakebay.net/status_protectingwatersheds.aspx?menuitem=19720)

<sup>36</sup> [http://www.chesapeakebay.net/status\\_fosteringstewardship.aspx?menuitem=19776](http://www.chesapeakebay.net/status_fosteringstewardship.aspx?menuitem=19776)

I hope this particular example assists the reader in understanding the various components required for proper ecosystem based management in the marine environment. This obviously means that less attention needs to be paid to spatial models that draw lines on maps, and much more attention needs to be paid to maintaining the actual nuts and bolts that hold these ecosystems together. The only way this can be done is through use of a risk based approach that prioritizes management responses to key processes that threaten biodiversity and ecosystem resilience in aquatic environments, sets management goals, and measures progress towards those goals over time. This is currently not being done well in Australia (Victorian Auditor General 2011), but if we don't do this well, we risk ignoring threatening processes that occur outside the lines on the map, which will simply result in more band-aids on cancers, and establishment of more MPAs that will poignantly stand as marine equivalents of terrestrial national parks built on garbage dumps.

## **8 *Transparency and accountability required for management of Commonwealth MPAs***

One issue that requires increased transparency and accountability with respect to Commonwealth managed MPAs is the question of management of scientific access to these areas. In 2007 on behalf of an international group of scientists I submitted to the then DEWHA a scientific research proposal for tagging of sportfish at Lihou Reef in the Coral Sea. Our objective was to determine their movements and gather other biological data that would assist with the management of the reserve and also to inform decisions made during the bioregional planning process. Lihou Reef is a MPA designated ICUN Category Ia, set aside primarily for research. The tagging programme was designed with assistance from the worlds foremost researchers in the field. The tagging methods to be used were identical to the non-lethal and non-destructive methods that are commonly used to study sportfish in no-take MPAs in other jurisdictions. DEWHA asked for modifications to the original application, which were made to meet their requirements, and the proposal was resubmitted. No progress on the proposal was made for some time, then after repeated phone and e-mail correspondence and a meeting with DEWHA staff, further revisions were made and the proposal was resubmitted again in 2009, after which time it was ignored. Given the paucity of information on fish movements in the Coral Sea, I am mystified as to why the research proposal was ignored, as the information that would have been gathered was (and still is) badly needed to inform management decisions in the region. No explanation for the failure to acknowledge the revised research proposal has ever been received from the department.

Recently, I became aware that other permits had been approved around the same time, providing access for a group who undertook an "11 day luxury conservation cruise" called "Project Lihou" in December 2009 and 2010<sup>37</sup>. The main objective of this trip appeared to be recreational diving and collection of video footage that was broadcast live at the Copenhagen Climate Change Conference and subsequently on the websites of several environmental NGOs. This lack of consistency and transparency in the decision making process for issue of research permits is a

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<sup>37</sup> <http://home.wilddiaries.com/2009/11/10/67/>

legitimate concern, especially given that a huge increase in the area of Commonwealth MPAs is likely in the near future as the bioregional planning process continues.

It is interesting to note that transparent regulation of scientific research in the Marianas Trench Marine National Monument is specifically enshrined in the founding proclamation for the monument as delivered by the Bush Administration (Appendix 2). This specifically mentions activities such as fishing, which is required during tagging research conducted on highly mobile sportfishes. “*The Secretary of Commerce may permit fishing within the monument for scientific exploration and research purposes to the extent authorized by the Magnuson-Stevens Fishery Conservation and Management Act*” (Appendix 2). It is recommended that a similarly transparent mechanism is developed for acknowledging, appraising and granting research permits for scientific activities (including fishing) in Commonwealth MPAs, to ensure that a repeat of our research teams experience does not occur in the future.

## **9      *The EPBC Amendment (Bioregional Plans) Bill 2011***

The demonstrable misunderstanding of some governments regarding the utility of MPAs for achieving various marine conservation goals has caused significant uncertainty within the fishing and marine industries throughout Australia. Also, audits of existing State administered MPAs in some parts of the country have found significant shortcomings in their administration and management, including evidence that park administrators cannot demonstrate they are effectively managing their MPAs or protecting marine biodiversity within their MPAs (Victorian Auditor General 2011). Failure of MPAs to meet their objectives means that significant social and economic costs and community hardship have been inflicted, often with little if any environmental benefit ensuing. This sort of news simply adds to increasing uncertainty as to whether existing MPA planning methodologies are sufficient and adequate, especially in instances where spatial mapping is being emphasized rather than proper risk based assessment and management of actual threatening mechanisms and processes.

Given the fact that Australias international obligations for marine protection are already largely fulfilled by its existing MPA network, there is no need to rush the remaining NRSMPA assessment process, especially as the original 2012 deadline has been revised to 2020. The remaining areas under further assessment are huge. There is still potential for nationally significant socio-economic and cultural losses if the government gets this process wrong. Given the national interest in this subject, it seems logical to add some additional checks and balances into the bioregional planning process to get it right. This could be done by providing Parliament with the opportunity to oversee the bioregional planning process, so that all ministers from various areas around the country get the opportunity to accurately reflect the wishes of their constituents, through making bioregional plans prepared under subsection (1) or (2) disallowable instruments for the purposes of section 46B of the *Acts Interpretation Act 1901*.

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## **Appendices**

### ***Appendix 1. Marine Life Thriving In Moreton Bay Green Zones***

**Minister for Climate Change and Sustainability**

**The Honourable Kate Jones**

**Thursday, September 02, 2010**

The Bligh Government's decision to move towards a more sustainable Moreton Bay is already paying dividends, new scientific data is showing.

Climate Change and Sustainability Minister Kate Jones said in State Parliament today that new research indicated Moreton Bay Marine Park's expanded green zones were showing early signs of increased fish numbers.

Ms Jones said since the start of new marine park zoning on 1 March 2009, scientific monitoring led by CSIRO was beginning to point to several promising trends. "Moreton Bay is a favourite spot for thousands of South East Queenslanders to enjoy relaxation and recreation right on Brisbane's doorstep," she said. "But using the Bay cannot come at a cost of reduced habitat and fishstocks, two key features that attract people to the region in the first place.

"That's why green zones were expanded last year to cover 16 per cent of the marine park's total area, to protect each of the marine park's habitat types from fishing and to protect dugongs and turtles with the introduction of go slow zones."

Ms Jones said the latest research showed green zones were acting as a nursery, allowing fish and crab populations to recover to more natural levels. "We expect these levels will lead to greater numbers of fish and crabs moving outside of the green zones," she said. "Preliminary results show mud crabs from the new green zones are already larger and more abundant than they are in adjacent non-green zones." Male mud crabs of legal size (15cm) were found between three and five times more frequently in the old green zones than outside the protected areas. In the new green zones, the numbers of legal size crabs are increasing, but haven't yet got to the levels of the original green zones.

At Willes island, catch rates outside the green zones were less than half a crab per pot, rising to over 1 crab per pot in the new green zone, and more than two crabs per pot in the old green zone. "Data is also indicating that certain fish species are becoming more abundant in the new offshore green zones around St Helena Island and Tripcony Bight," Ms Jones said. "The CSIRO and other research organisations are examining the new zoning plan's effect on commercial and recreational fish species, the effectiveness of go slow zones in reducing impacts on turtles and dugongs and the socio-economic implications of the revised marine park."

A survey of 200 recreational fishers was undertaken a year after the rezoning of the marine park. The survey's findings included:

- the impact of the rezoning on recreational fishers, in relation to closure of favourite fishing areas or crowding at fishing locations, was minimal.
- respondents reported no additional travel costs to access a fishing area as a result of closures or crowding.
- only one per cent of fishers interviewed reported a decrease in catch.
- there was a strong perception that fishing restrictions were actively enforced and that the fishers had access to sufficient information regarding zoning.

“Nature changes slowly, and it’s too early to expect to see any major response to the changed conditions in the marine park,” Ms Jones said. “However, the results from the monitoring program are significant and point to Moreton Bay showing the same positive changes over time as have been observed in other marine park areas across the world.

“Most relevant of these for Queensland has been the equally positive impact of marine park zoning in the Great Barrier Reef.”



## ***Appendix 2. Establishment of the Marianas Trench Marine National Monument***

<http://georgewbush-whitehouse.archives.gov/news/releases/2009/01/20090106-2.html>

### **A Proclamation by the President of the United States of America**

Over approximately 480 nautical miles, the Mariana Archipelago encompasses the 14 islands of the United States Commonwealth of the Northern Mariana Islands and the United States Territory of Guam that sit atop the Mariana Ridge in an area known as the Mariana Volcanic Arc. The Mariana Volcanic Arc is part of a subduction system in which the Pacific Plate plunges beneath the Philippine Sea Plate and into the Earth's mantle, creating the Mariana Trench. Six of the archipelago's islands have been volcanically active in historic times, and numerous seamounts along the Mariana Ridge are volcanically or hydrothermally active. The Mariana Trench is approximately 940 nautical miles long and 38 nautical miles wide within the United States Exclusive Economic Zone and contains the deepest known points in the global ocean.

The Mariana Volcanic Arc contains objects of scientific interest, including the largest active mud volcanoes on Earth. The Champagne vent, located at the Eifuku submarine volcano, produces almost pure liquid carbon dioxide. This phenomenon has only been observed at one other site in the world. The Sulfur Cauldron, a pool of liquid sulfur, is found at the Daikoku submarine volcano. The only other known location of molten sulfur is on Io, a moon of Jupiter. Unlike other reefs across the Pacific, the northernmost Mariana reefs provide unique volcanic habitats that support marine biological communities requiring basalt. Maug Crater represents one of only a handful of places on Earth where photosynthetic and chemosynthetic communities of life are known to come together.

The waters of the archipelago's northern islands are among the most biologically diverse in the Western Pacific and include the greatest diversity of seamount and hydrothermal vent life yet discovered. These volcanic islands are ringed by coral ecosystems with very high numbers of apex predators, including large numbers of sharks. They also contain one of the most diverse collections of stony corals in the Western Pacific. The northern islands and shoals in the archipelago have substantially higher large fish biomass, including apex predators, than the southern islands and Guam. The waters of Farallon de Pajaros (also known as Uracas), Maug, and Asuncion support some of the largest biomass of reef fishes in the Mariana Archipelago. These relatively pristine coral reef ecosystems are objects of scientific interest and essential to the long-term study of tropical marine ecosystems.

WHEREAS the submerged volcanic areas of the Mariana Ridge, the coral reef ecosystems of the waters surrounding the islands of Farallon de Pajaros, Maug, and Asuncion in the Commonwealth of the Northern Mariana Islands, and the Mariana Trench contain objects of scientific interest that are situated upon lands owned or controlled by the Government of the United States;

WHEREAS the United States continues to act in accordance with the balance of interests relating to traditional uses of the oceans recognizing freedom of navigation and overflight and other internationally recognized lawful uses of the sea;

WHEREAS the islands, waters, and airspace of the Mariana Ridge are of particular importance to the national security of the United States;

WHEREAS section 2 of the Act of June 8, 1906 (34 Stat. 225, 16 U.S.C. 431)(the "Antiquities Act") authorizes the President, in his discretion, to declare by public proclamation historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest that are situated upon lands owned or controlled by the Government of the United States to be national monuments, and to reserve as a part thereof parcels of land, the limits of which in all cases shall be confined to the smallest area compatible with the proper care and management of the objects to be protected;

WHEREAS it is in the public interest to preserve the known volcanic areas of the Mariana Ridge, the marine environment around the islands of Farallon de Pajaros, Maug, and Asuncion in the Commonwealth of the Northern Mariana Islands, and the Mariana Trench for the care and management of the scientific objects therein:

NOW, THEREFORE, I, GEORGE W. BUSH, President of the United States of America, by the authority vested in me by section 2 of the Antiquities Act do proclaim that there are hereby set apart and reserved as the Marianas Trench Marine National Monument (the "monument" or "marine national monument") for the purpose of protecting the objects identified above, all lands and interests in lands owned or controlled by the Government of the United States within the boundaries described below and depicted on the accompanying map entitled "Marianas Trench Marine National Monument" attached to and forming a part of this proclamation. The monument includes the waters and submerged lands of the three northernmost Mariana Islands (the "Islands Unit") and only the submerged lands of designated volcanic sites (the "Volcanic Unit") and the Mariana Trench (the "Trench Unit") to the extent described as follows: The seaward boundaries of the Islands Unit of the monument extend to the lines of latitude and longitude depicted on the accompanying map, which lie approximately 50 nautical miles from the mean low water line of Farallon de Pajaros (Uracas), Maug, and Asuncion. The inland boundary of the Islands Unit of the monument is the mean low water line. The boundary of the Trench Unit of the monument extends from the northern limit of the Exclusive Economic Zone of the United States in the Commonwealth of the Northern Mariana Islands to the southern limit of the Exclusive Economic Zone of the United States in Guam approximately following the points of latitude and longitude identified on the accompanying map. The boundaries of the Volcanic Unit of the monument include a circle drawn with a 1 nautical mile radius centered on each of the volcanic features identified on the accompanying map and its legend. The Federal land and interests in land reserved consists of approximately 95,216 square miles of submerged lands and waters of the Mariana Archipelago, which is the smallest area compatible with the proper care and management of the objects to be protected.

Submerged lands that by legislation are subsequently granted by the United States to the Commonwealth of the Northern Mariana Islands but remain controlled by the United States under the Antiquities Act may remain part of the monument, for coordination of management with the Government of the Commonwealth of the Northern Mariana Islands. Any submerged lands and interests in submerged lands within the monument not owned or controlled by the

United States shall be reserved as a part of the monument upon acquisition of title or control by the United States.

### **Management of the Marine National Monument**

The Secretaries of Commerce, through the National Oceanic and Atmospheric Administration, and the Interior, shall manage the monument pursuant to applicable legal authorities and in consultation with the Secretary of Defense. The Secretary of the Interior shall have management responsibility for the monument, in consultation with the Secretary of Commerce, except that the Secretary of Commerce shall have the primary management responsibility, in consultation with the Secretary of the Interior, with respect to fishery-related activities regulated pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.) and any other applicable authorities. The Secretaries of the Interior and Commerce shall not allow or permit any appropriation, injury, destruction, or removal of any feature of this monument except as provided for by this proclamation or as otherwise provided for by law.

The Secretaries of the Interior and Commerce shall take appropriate action pursuant to their respective authorities under the Antiquities Act and the Magnuson-Stevens Fishery Conservation and Management Act, and such other authorities as may be available to implement this proclamation, to regulate fisheries, and to ensure proper care and management of the monument.

### ***Regulation of Scientific Exploration and Research***

Subject to such terms and conditions as the Secretary deems necessary for the care and management of the objects of this monument, the Secretary of the Interior may permit scientific exploration and research within the monument, including incidental appropriation, injury, destruction, or removal of features of this monument for scientific study, and the Secretary of Commerce may permit fishing within the monument for scientific exploration and research purposes to the extent authorized by the Magnuson-Stevens Fishery Conservation and Management Act. The prohibitions required by this proclamation shall not restrict scientific exploration or research activities by or for the Secretaries, and nothing in this proclamation shall be construed to require a permit or other authorization from the other Secretary for their respective scientific activities.

### ***Regulation of Fishing and Management of Fishery Resources***

Within the Islands Unit of the monument, the Secretary of Commerce shall prohibit commercial fishing. Subject to such terms and conditions as the Secretary of Commerce deems necessary for the care and management of the objects of the Islands Unit, the Secretary, consistent with Executive Order 12962 of June 7, 1995, as amended, shall ensure that sustenance, recreational, and traditional indigenous fishing shall be managed as a sustainable activity consistent with other applicable law and after due consideration with respect to traditional indigenous fishing of any determination by the Government of the Commonwealth of the Northern Mariana Islands.

### ***Monument Management Planning***

The Secretaries of the Interior and Commerce shall, within 2 years of the date of this proclamation, prepare management plans within their respective authorities and promulgate implementing regulations that address any further specific actions necessary for the proper care and management of the objects identified in this proclamation. In developing and implementing any management plans and any management rules and regulations, the Secretaries shall designate and involve as cooperating agencies the agencies with jurisdiction or special expertise, including the Department of Defense, the Department of State, and other agencies through scoping in accordance with the National Environmental Policy Act (42 U.S.C. 4321 et seq.), its implementing regulations and with Executive Order 13352 of August 26, 2004, Facilitation of Cooperative Conservation, and shall treat as a cooperating agency the Government of the Commonwealth of the Northern Mariana Islands, consistent with these authorities. The monument management plans shall ensure that the monument will be administered in accordance with this proclamation, and shall, as appropriate to their respective authorities, provide for:

1. management of the Islands Unit of the monument, in consultation with the Government of the Commonwealth of the Northern Mariana Islands, including designation of specific roles and responsibilities and the means of consultation on management decisions as appropriate, without affecting the respective authorities or jurisdictions of the Commonwealth of the Northern Mariana Islands or the Secretaries of the Interior or of Commerce;
2. public education programs and public outreach regarding the coral reef ecosystem and related marine resources and species of the monument and efforts to conserve them;
3. traditional access by indigenous persons, as identified by the Secretaries in consultation with the Government of the Commonwealth of the Northern Mariana Islands, for culturally significant subsistence, cultural and religious uses within the monument;
4. a program to assess and promote monument-related scientific exploration and research, tourism, and recreational and economic activities and opportunities in the Commonwealth of the Northern Mariana Islands;
5. a process to consider requests for recreational fishing permits in certain areas of the Islands Unit, based on an analysis of the likely effects of such fishing on the marine ecosystems of these areas, sound professional judgment that such fishing will not materially interfere with or detract from the fulfillment of the purposes of this proclamation, and the extent to which such recreational fishing shall be managed as a sustainable activity consistent with Executive Order 12962, as amended, and other applicable law; and
6. programs for monitoring and enforcement necessary to ensure that scientific exploration and research, tourism, and recreational and commercial activities do not degrade the monument's coral reef ecosystem or related marine resources or species or diminish the monument's natural character.

The management plans and their implementing regulations shall impose no restrictions on innocent passage in the territorial sea or otherwise restrict navigation, overflight, and other

internationally recognized lawful uses of the sea, and shall incorporate the provisions of this proclamation regarding Armed Forces actions and compliance with international law.

This proclamation shall be applied in accordance with international law. No restrictions shall apply to or be enforced against a person who is not a citizen, national, or resident alien of the United States (including foreign flag vessels) unless in accordance with international law.

Nothing in this proclamation shall be deemed to diminish or enlarge the jurisdiction of the Commonwealth of the Northern Mariana Islands.

### **Advisory Council**

The Secretaries of the Interior and Commerce, within 3 months of the date of this proclamation and after considering recommendations from the Governor of the Commonwealth of the Northern Mariana Islands, the Secretary of Defense, and the Secretary of Homeland Security, shall establish the Mariana Monument Advisory Council to provide advice and recommendations on the development of management plans and management of the monument. The Advisory Council shall consist of three officials of the Government of the Commonwealth of the Northern Mariana Islands and one representative each from the Department of Defense and the United States Coast Guard.

Members of the Advisory Council will be appointed for a term of 3 years by the Secretaries of the Interior and Commerce after nomination by the head of the pertinent executive branch agency or, with respect to the officials of the Government of the Commonwealth of the Northern Mariana Islands, by the Governor of the Commonwealth of the Northern Mariana Islands. The Advisory Council will adopt such procedures as it deems necessary to govern its activities. Each participating agency shall be responsible for the expenses of its representative and the Departments of the Interior and Commerce shall be equally responsible for the costs of the Advisory Council.

### **Emergencies, National Security, and Law Enforcement Activities**

1. The prohibitions required by this proclamation shall not apply to activities necessary to respond to emergencies threatening life, property, or the environment, or to activities necessary for national security or law enforcement purposes.
2. Nothing in this proclamation shall limit agency actions to respond to emergencies posing an unacceptable threat to human health or safety or to the marine environment and admitting of no other feasible solution.

### **Armed Forces Actions**

1. The prohibitions required by this proclamation shall not apply to activities and exercises of the Armed Forces (including those carried out by the United States Coast Guard).

2. The Armed Forces shall ensure, by the adoption of appropriate measures not impairing operations or operational capabilities, that its vessels and aircraft act in a manner consistent, so far as is reasonable and practicable, with this proclamation.

3. In the event of threatened or actual destruction of, loss of, or injury to a monument living marine resource resulting from an incident, including but not limited to spills and groundings, caused by a component of the Department of Defense or the United States Coast Guard, the cognizant component shall promptly coordinate with the Secretary of the Interior or Commerce, as appropriate, for the purpose of taking appropriate actions to respond to and mitigate any actual harm and, if possible, restore or replace the monument resource or quality.

4. Nothing in this proclamation or any regulation implementing it shall limit or otherwise affect the Armed Forces' discretion to use, maintain, improve, manage, or control any property under the administrative control of a Military Department or otherwise limit the availability of such property for military mission purposes.

This proclamation is not intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity, by any party against the United States, its agencies, instrumentalities, or entities, its officers, employees, agents, or any other person.

All Federal lands and interests in lands within the boundaries of this monument are hereby withdrawn from all forms of entry, location, selection, sale, or leasing or other disposition under the public land laws, to the extent that those laws apply. The establishment of this monument is subject to valid existing rights. Nothing in this proclamation shall be deemed to revoke any existing withdrawal, reservation, or appropriation; however, the national monument shall be dominant over any other existing Federal withdrawal, reservation, or appropriation. Warning is hereby given to all unauthorized persons not to appropriate, excavate, injure, destroy, or remove any feature of this monument and not to locate or settle upon any lands thereof.

IN WITNESS WHEREOF, I have hereunto set my hand this sixth day of January, in the year of our Lord two thousand nine, and of the Independence of the United States of America the two hundred and thirty-third.

GEORGE W. BUSH