

Criticisms of science, social impacts, opinion leaders, and targets for no-take zones led to cuts in New South Wales' (Australia) system of Marine Protected Areas<sup>1</sup>

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## Introduction

On 12 March 2013 the state Government of New South Wales (NSW), Australia, announced a new approach to managing its marine environment (including calling it the 'marine estate'). This included announcing an amnesty on recreational shore-based fishing in all ocean beach and headland sanctuary zones (i.e. no-take) in its State-wide system of large multiple-use marine protected areas (MPAs), called marine parks, and a moratorium on declaring more marine parks (NSW Government, 2013a). The NSW Government Ministers responsible for marine parks stated "...decisions around the management of the NSW marine estate will now be based on science and in the long term interest of community, marine ecosystems and industry. The NSW Government is delivering on its election commitment for a common sense marine parks policy...After years of political interference and decisions based on poor or incomplete science...the credibility of Marine Parks and our fishing industries has been undermined" (NSW Government, 2013a) and "There is little or no scientific basis for preventing line fishing from land...We are immediately giving an amnesty to that" (The Coffs Coast Advocate, 2013). Despite the relatively minor change in total area of no-take zones in NSW's marine parks this decision attracted the most attention from conservation groups, recreational fishing groups and scientists. However, the changes announced also included a potentially far-reaching shift in policy approach to biodiversity conservation away from the nationally agreed precautionary use of a representative network of MPAs to a risk-based framework.

Australia has been implementing a National Representative System of Marine Protected Areas (NRSMPA) as a uniform national approach to conserve marine biodiversity. In 1998 the governments of Australia with marine coasts (i.e. the Commonwealth, all States, the Northern Territory) undertook to establish the NRSMPA by 2012 to achieve national goals for sustainable development (Commonwealth of Australia, 1992) and biodiversity conservation (Commonwealth of Australia, 1996), and comply with international obligations under the Convention on Biological Diversity. The process of short-listing, selecting and designing MPAs that would form part of the NRSMPA has been guided by goals and principles agreed to by all these governments (ANZECC 1999) to ensure a consistent approach to biodiversity conservation.

The most recent review of the implementation of the NRSMPA documented significant progress in the identification of candidate MPAs, the development of new management plans, and the

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establishment of new MPAs (National Marine Protected Areas Working Group, 2008). But in recent years there have been slow-downs in the establishment of new MPAs and proposed changes in existing MPAs, not only in NSW but also in other Australian states and in Commonwealth waters. In July 2010 the State Government of Victoria announced a moratorium on the establishment of any further MPAs (leaving 11.7% of State's waters as MPAs and gaps in the implementation of Victoria's contribution to the NRSMPA). In February 2014 the Premier of Queensland announced a proposal to reduce the size of a no-take zone within the Moreton Bay Marine Park to allow shore-based recreational fishing within it (16% of the Park is no-take zones) (Queensland Government, 2014) and the State's National Parks Minister invited recreational fishers to nominate other no-take zones in which they would like the right to catch fish (Courier Mail, 2014). The new incoming Liberal State Government in Tasmania said, prior to its March 15 election win, that it would impose a moratorium on any new MPAs in the State's waters (Tasmanian Liberals, 2014). At that time 7.9% of Tasmanian coastal waters was MPA, with most of that being around sub-antarctic Macquarie Island (Tasmania Parks and Wildlife Service, 2014).

In November 2012 the then Australian Government's Minister for the Environment proclaimed the remaining sections of the Australian Government's contribution<sup>2</sup> to the NRSMPA, describing it as "the world's biggest network of marine reserves" (Australian Government, 2012). Management plans were developed, which included large areas of no-take zones. The change of the Australian Government in 2013 led to the scrapping of the management plans (the boundaries of the MPAs were unchanged) and establishment of a Marine Reserves Review to ensure that the network was "based on scientific rigor and genuine consultation with communities and industries" (Australian Government, 2013). During the Review users are allowed to use the marine reserves without the restrictions imposed by the zones and management plans. The Review will be considering the South-west, North-west, North, Temperate East and Coral Sea reserves.

Given the commitments of national governments around the world to implementing the goals of the Convention on Biological Diversity for MPA declaration, the prominent role of Australia in recent decades in the declaration of MPAs (e.g. Fernandes *et al.*, 2009), and the apparent flow-on effects of the changes in NSW's MPAs to other Australian States and the Commonwealth, it is worth reviewing the events that led up to the March 2013 decision by the NSW Government and the underlying forces that shaped the decisions, and reflecting on their broader relevance and meaning for MPA planning and declarations not only in Australia but also elsewhere.

### **Recent changes in MPAs in NSW**

The marine environment managed by the state of NSW has been divided into five meso-scale bioregions that form part of the national planning framework for implementing the NRSMPA. The policy of the NSW State Government was to establish a network of MPAs that met the objectives of the NRSMPA as well as local or State-level conservation needs. This was done by establishing large, multiple-use MPAs (called marine parks) in the bioregions and smaller MPAs (intertidal protected

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<sup>2</sup> In Australia the States and the Northern Territory have jurisdiction over marine waters to three nautical miles offshore from the coast, while the national Australian Government has jurisdiction offshore from the State's waters to the outer limits of the Australian Exclusive Economic Zone (200 nautical miles).

areas, aquatic reserves, marine extensions of terrestrial national parks). Six large marine parks have been established: Jervis Bay (1998), Solitary Islands (1998), Lord Howe Island (1999), Cape Byron (2002), Port Stephens-Great Lakes (2005), and Batemans (2006). Two bioregions do not have a marine park in NSW: Hawkesbury Shelf (which includes the coastal and harbour waters adjacent to Sydney), and Twofold Shelf (which is shared with Victoria). The total area of these marine parks is 345,100 hectares, representing approximately 34% of NSW State waters (NSW Government, 2014a).

The NSW marine parks were selected and designed according to nationally agreed goals and principles for the development of the NRSMPA, which were (i) the use of bioregions as the planning framework, (ii) inclusion of the range of ecosystems within bioregions (i.e. comprehensiveness), (iii) ecological viability of populations, species and communities (i.e. adequacy), (iv) inclusion of the biotic diversity of ecosystems (i.e. representativeness), (v) inclusion of highly protected areas (IUCN Category I and II) in each bioregion, (vi) use of the precautionary principle (but see Kearney *et al.*, 2012a), (vii) consultation with community and interest groups as a means of addressing socio-economic and cultural impacts (but see Voyer *et al.*, 2012), (viii) incorporation of the interests of indigenous people, and (ix) decision-making that considered both short- and long-term consequences.

Conflict and resistance from local communities occurred during the planning processes of all six marine parks in NSW, with opposition becoming more intense with each new declaration. The most recent declaration, the Batemans Marine Park, arguably led to the most concentrated and prolonged opposition. Opposition was focused on the necessity for no-take sanctuary zones when, opponents claimed, there was no evidence that recreational fishing was a risk to marine biodiversity, and other activities with much greater impacts (such as pollution) were not addressed through MPAs and no-take zones. The scientific arguments put forward by managers justifying the use and effectiveness of no-take zones were challenged in the media (Voyer *et al.*, 2013a), online forums, public meetings and scientific conferences (Kearney, 2007) and some published scientific literature (Kearney, 2012; Kearney *et al.*, 2012b). There was particular criticism of the science used to justify no-take zones on beaches. Opponents also argued on the grounds of the effective management of fisheries in NSW and social impacts on the poor, disabled and elderly who, lacking the mobility to find alternative fishing grounds, were disproportionately affected by the establishment of no-take zones that included favoured fishing spots (Kearney, 2007).

In support of the science underlying the use of MPAs as one tool for marine environmental management, the State's peak body of marine scientists, the NSW branch of the Australian Marine Sciences Association (AMSA), issued in 2008 a consensus statement signed by 69 marine scientists and managers<sup>3</sup>. Despite this, the major voices heard in the media about marine parks were government, conservation groups, and fishing groups, with scientists being prominent spokespeople in less than 5% of news articles about the Port Stephens-Great Lakes and Batemans Marine Park (Voyer *et al.*, 2013b).

In response to continued public criticism by recreational fishing groups and some scientists of the science justifying the use of no-take zones, the NSW Government commissioned a review of marine park science. In December 2009 the NSW Government released the report of the Independent Review of Marine Park Science in NSW. The Independent Review Panel agreed with some of the

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<sup>3</sup> Disclosure: I was one of the co-authors of this consensus statement.

criticisms of the science used to support the marine parks strategy, and highlighted the need for “integrating socio-economic studies with biophysical studies to improve the effectiveness of the management of MPAs” and the need to “Clarify marine biodiversity for the wider public of NSW, focussing upon concepts, values and examples, rather than a focus upon any arguable spin-offs for fishing”, and “Be more assertive about the science and other research behind the NSW Marine Park systems but also acknowledge areas of uncertainty or disagreement with public arguments” (Fairweather *et al.*, 2009). This scrutiny of the science underpinning MPAs has also been seen more recently through the current review by the Australian Government of the ‘scientific rigor’ underlying the MPA zoning decisions overseen by the previous government and, in the lead up to the March 2014 election for the South Australian State Government, when the Liberal opposition criticised the science underlying that State’s network of MPAs (ABC, 2014).

In November 2009 the NSW Government announced a parliamentary enquiry into recreational fishing, with its first term of reference addressing “...the process for the creation of Marine Protected Areas and Marine Parks...”. The report, released in December 2010, made several recommendations regarding marine parks, the most significant being a five-year moratorium on the creation of any new marine parks and revocation of the no-take sanctuary zone status for some zones in some parks while their usefulness was assessed.

The public debate about marine parks in NSW was elevated in the months before the March 2011 State Government election. The incumbent Labor Government made a commitment to establish no further marine parks for five years, while agreeing to a revision of the zoning plan of the Solitary Islands Marine Park that would have substantially increased the area of no-take zones. The election led to a change in Government that is a coalition of the conservative Liberal and National parties. The new Government changed the administration of marine parks by transferring responsibility for their management from the environment to primary industries portfolio, maintaining the five-year moratorium on the creation of new marine parks declared by the previous government, reversing the changes that were meant to be implemented in the Solitary Islands Marine Park, and declaring a five-year moratorium on zoning plan reviews. The Government justified the moratorium and the zoning reversals by stating that further community consultation and scientific research were needed (Voyer *et al.*, 2012).

In June 2011, in fulfilment of a pledge made during the election campaign, the NSW Government commissioned an Independent Scientific Audit of Marine Parks in NSW. The Audit was justified by the need to “...ensure that the scientific foundations of the NSW Government’s Marine Parks policy are rigorous, transparent and publicly available... a Marine Parks Policy that is based on science, not on politics.” The Government stated that “The independent scientific audit will provide a firm basis for consultation with communities and enable us to develop balanced policies that provide for protection of the marine environment as well as supporting a wide range of other uses including recreational activities” (NSW Government, 2011).

The report of the scientific audit of NSW marine parks was released in Feb 2012 (Beeton *et al.*, 2012). The report’s recommendations included: a reorganization of the governance of the NSW ‘marine estate’ so that it fell under a single legislative and administrative structure, formation of an independent scientific committee to oversee the science that supported management of the marine estate, maintenance of the current system of marine parks, protection of marine biodiversity in the

two bioregions lacking large multiple use MPAs, greater integration of biophysical, social and economic research, and research into the threats (including fishing) to NSW marine biodiversity and the role of marine parks in mitigating these threats.

More than 12 months later, in March 2013, the NSW Government responded to the Audit's recommendations. These included (1) disbanding the existing management structure (i.e. the NSW Marine Parks Authority) and establishing two new advisory bodies; (2) announcing an immediate amnesty on line fishing in no-take sanctuary zones on ocean beaches and coastal headlands within marine parks (except for sites protecting threatened species); (3) undertaking a threat and risk assessment for the NSW marine estate; and (4) maintaining the moratorium on new marine parks, until advice was received from one of the new advisory bodies, the Marine Estate Expert Knowledge Panel (NSW Government, 2013b).

The amnesty on recreational line fishing in no-take zones was publicly opposed by conservation groups and marine scientists. In January 2014 the NSW branch of AMSA released a 'science statement on marine park zoning in New South Wales' that expressed concern that "...the integrity of the NSW marine parks network and marine conservation objectives will be severely undermined by Government moves to allow recreational fishing in sanctuary zones... represent a considerable step backwards in environmental awareness in the country's most populous state and as such has drawn the attention of inter-state and international marine scientists." The statement was signed by 222 marine scientists from NSW, elsewhere in Australia, and other countries (NSW AMSA, 2014).

The approach to marine conservation in NSW has changed over a relatively short period of time from a commitment by the State Government to implement the State's components of the NRSMPA, including a commitment to the principle of including highly protected zones, to the current situation (March 2014) where the usefulness of MPAs as a tool for biodiversity conservation is being re-evaluated and potentially replaced with a risk-based approach, responsibility for MPAs is vested with the State's agency managing primary industries, where not all bioregions have a large multiple-use marine park, there is an amnesty on recreational line fishing in no-take zone on coastal beaches and headlands in marine parks, and there is a new whole-of-State's waters management framework. The timeline of changes in marine conservation that are occurring around Australia and the changing focus from "biodiversity conservation" to "risk management", suggest that these changes began in NSW. My own involvement in the public debates about MPAs in NSW, in MPA advisory committees and in MPA research with colleagues formed my opinions that the underlying forces that drove these changes in NSW included: perceptions among stakeholders that planning was setting out to meet unrealistic targets for no-take zoning, unacknowledged social impacts, the public arguments of key individuals in the recreational fishing and fisheries science sectors, and the casting of doubt on the legitimacy of the science.

## **Targets**

While the principles of MPA selection and design provided in the ANZECC guidelines included the need to completely protect some area of habitats, a target % was not specified. The NSW State biodiversity conservation strategy that was in action at the time the NSW MPA network was being established had as its performance target 'a comprehensive, adequate and representative reserve

system established for terrestrial (other than forest reserves) and marine ecosystems by 2010' (NPWS, 1997). The guide to implementing the NRSMPA in NSW (NSW MPA, 2001) did not refer to % area targets for NSW MPAs or no-take MPAs. The World Summit on Sustainable Development set out to achieve representative networks of MPAs by 2012, without quantifying targets (WSSD, 2002). In 2006 the 8<sup>th</sup> Ordinary Conference of the Parties to the Convention on Biological Diversity set a target for effective conservation by 2010 of 'at least 10% of each of the world's ecological regions' with the indicator being coverage of protected areas (CBD, 2006). The 5<sup>th</sup> IUCN World Parks Congress (WPC) in 2003 recommended that 20-30% of marine habitats be included in strictly protected areas by 2012 (WPC, 2003). The absence of specific targets in some documents, confusion about whether targets in international agreements were binding or aspirational for signatory national governments (Beeton *et al.*, 2012) and whether they referred to multiple-use MPAs or no-take MPAs, the lack of clear definitions, and the promotion of WPC targets by many conservation groups, created a confusing environment for stakeholders.

In NSW local opposition to no-take zones in some marine parks was fuelled by the perception that these zones were added in areas (such as beaches) where there were few if any threats to biodiversity in order to meet unstated and/or unjustified targets for % area zoned as no-take. At the same time there was the perception among MPA proponents that no-take zones were the ideal form of conservation and the measure by which conservation success should be judged. The issues associated with MPA selection being focused on the achievement of targets for no-take zones have been reviewed elsewhere (Agardy *et al.*, 2003; Pressey, 2013). In NSW the perception that zoning was directed by a pursuit of ill define and arbitrary targets, in contrast to the real needs for conservation and management, entrenched opposition and led to a scrutiny by opponents of the justification for no-take zones, the science underlying their use, and the processes of decision-making around zoning.

### **Criticisms of the science**

Threats to the marine biodiversity of NSW include: climate change, extractive resource use, land-based and marine pollution, and bioinvasions of pest species and disease (Beeton *et al.*, 2012). Supporters of the use of MPAs for biodiversity conservation in NSW pointed to global concerns about the effects of fishing and numbers of over-fished species and the use of MPAs as a precautionary approach (Beeton *et al.*, 2012). Critics argued that fishing was the only threat that was managed by a marine park and that a disproportionate burden for biodiversity conservation was being borne by fishers, especially recreational fishers (Kearney *et al.*, 2012b). Critics also argued that marine parks and especially no-take zones were unnecessary because fisheries management in NSW was effective (Kearney, 2007; Kearney *et al.*, 2012b). The available evidence shows 7.5% assessed finfish and shark species caught predominantly in NSW being over-fished, although the status of 52% is undefined or uncertain (Rowling *et al.*, 2010), and seven marine fish species are listed as threatened (NSW Government, 2014b). The NRSMPA framework approach of establishing a system of representative MPAs in each bioregion was criticised because it did not adopt a risk-based approach, involving the identification of the actual threats to marine biodiversity in a bioregion and the development of an appropriate management response rather than the uncritical establishment of MPAs (Kearney, 2007).

The scientific evidence used to justify the restriction of fishing for biodiversity conservation, through the establishment of no-take zones, was publically criticised. There was especially harsh criticism of the decision to establish no-take zones on ocean beaches, where the decision was said to be flawed because the species targeted by fishers on beaches were mostly not over-fished and the species are mostly migratory and therefore highly unlikely to benefit from a no-take zone (Kearney, 2007). The available knowledge on the biology of most of these species suggests this criticism was valid. The scientific case put forward by the NSW Marine Parks Authority at the time justifying the use of MPAs for biodiversity conservation was hurt by specific and detailed criticisms from scientists (Kearney, 2007) and the Independent Scientific Panel (Fairweather *et al.*, 2009) of its interpretation of the results of published studies of the effectiveness of MPAs. A 2007 workshop into spatial management of fisheries convened by the Australian Society for Fish Biology concluded that “a case study of the recently established Batemans Marine Park in southern NSW found little scientific evidence to support the siting of no-take zones and claims that these would benefit fish populations. The workshop expressed concern at the biased selection of scientific information to justify the creation of these zones” (Treloar and Tilzey, 2007). The use of evidence of the global status of fisheries and the effects of establishing MPAs was questioned by critics, and the public debate was to some extent uninformed by a lack of examples from NSW of the benefits for biodiversity from no-take MPAs or the effects of recreational fishing.

The focus of a lot of the criticism on the justification (or lack of a justification) for no-take zones on beaches had the broader effect of sowing doubts in the minds of stakeholders about the general validity of marine park planning decisions and the need for no-take zones. Although the scrutiny was justified, the extent of scrutiny of this specific issue occurred at the cost of informed debate about the value of no-take MPAs for protecting critical habitats (such as spawning aggregation sites and sites important for threatened species) and for maintaining undisturbed reference sites for research, education and monitoring.

The approach of consulting NSW stakeholders about a proposed MPA, while theoretically sound, assumes that individuals accept the concept of an MPA as the appropriate management response. This assumption was fundamentally rejected in NSW (Voyer *et al.*, 2013a). Stakeholders, who themselves supported the aim of environmental protection, wanted a more active role in deciding the most suitable approach to management of significant environmental threats rather than being part of a process whose ultimate outcome was the establishment of an MPA and no-take zones with, in some cases, an uncertain justification for restrictions of fishing activities.

Putting aside the argument of whether MPAs were the appropriate management response to the threats facing biodiversity, the arguments supporting their use for biodiversity conservation became confused with arguments about their benefits for fisheries. This was never, however, the intention of these MPAs. The primary goal of the strategic plan for the NRSMPA is “to establish and manage a comprehensive, adequate and representative system of MPAs 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” (ANZECC, 1999 p 15). The secondary goals also do not refer to improvements in fisheries or fishing experiences. Perceiving a difficulty in arguing a case for biodiversity conservation where the ‘biodiversity’ concept is poorly understood by the wider community, MPA managers and supporters focussed on the potential collateral benefits for fisheries and fishers from MPAs through spillover and enhancement of larval recruitment in

fished areas (Voyer *et al.*, 2013a). However, at the time this was being done there was little evidence for these benefits, and none from NSW, which weakened the position that was being prosecuted and lent weight to arguments that there was no scientific evidence for the use of MPAs, that MPAs were promoted by people who were anti-fishing in any form, and that marine scientists were acting as conservation advocates.

### **Role of scientists**

Despite collective attempts by NSW marine scientists to promote the scientific evidence supporting the value of no-take zones and MPAs through consensus statements from the peak and submissions to the enquiries into marine park science, recreational fishing and the audit, their public voices were relatively minor compared with the much greater representation by fishing groups, conservation groups, and government spokespeople (Voyer *et al.*, 2013b). Scientists supporting MPAs were accused of being unquestioning advocates and adherents to 'faith-based science' (Kearney, 2012) and the public debate about the science of MPAs was intense and personal on some occasions. Public debate occurs in many arenas of conservation and environmental protection, and scrutiny of the science underlying government decisions is entirely warranted because of the potential social, environmental and economic consequences. Such scrutiny is also part of a healthy scientific process. However, the intensity in which the public debate in NSW was conducted had the effect of discouraging many scientists from publicly participating and of creating an enduring suspicion among some stakeholder groups (especially recreational fishers) about the motives and objectivity of academic marine scientists.

### **Social impacts**

Opposition to the establishment of marine parks and the zoning plans that followed was fuelled by the absence of proper social impact assessments of the groups that were negatively impacted or believed they were going to be negatively impacted such as recreational fishers, commercial fishers, and indigenous people (Kearney, 2007; Voyer *et al.*, in press). Public participation exercises (such as public meetings, requests for submissions of opinion on draft zoning plans) and economic assessments were used as the primary tools for gauging the social impacts of the marine parks and their zoning plans, on the assumptions that people will volunteer their views and that economic impacts are the primary determinants of social impacts. This approach led to participation exercises being hijacked by vocal spokespeople for particular stakeholder groups or coordinated campaigns of online, email, or written submissions often from groups based outside the area where the marine park was being established. The latter further deepened the divisions between local supporters and opponents, who perceived the consultation process was being overly influenced by 'outsiders' representing the opposing view. Economic reporting and forecasting of the potential costs and benefits of marine parks for a town or region did not capture the importance for individuals or groups of individuals of particular traditions, places, food items, or cultural values. Public participation exercises are better used as one of the information gathering tools for a detailed social impact assessment (Vanclay, 2012). These assessments were not done as part of the marine park planning. If they had been done, they may have led to more informed discussions and better

judgements about the impacts and benefits likely to be felt throughout the local communities and built trust with the management agencies.

### **The role of opinion leaders and the media**

At the time that opposition to marine parks and no-take zones in NSW became public a majority of people in communities associated with marine parks supported them and supported no-take zones (Marine Parks Authority NSW, 2008). However the strength of the emerging public debate and the associated language resembled a battle (Voyer *et al.*, 2013b). In the case of the Batemans Marine Park spokespeople in the media either strongly opposed or strongly supported marine parks (Voyer *et al.*, 2013a). This probably discouraged others with more moderate views from participating. As a result, a small number of individuals advocating strongly for a minority position (absolute opposition to no-take zones) played a major part in the fate of NSW marine parks. Despite the fact that many on both sides of the debate were motivated by a desire to protect the environment and support their local community, the public debate in the media and the community consultations were not sufficiently nuanced to allow broader discussion and consideration of alternative approaches or representation of a majority viewpoint.

### **Conclusions**

In many ways the dynamics of MPA planning and implementation that have occurred in NSW since 2007 mirrors other situations where MPAs have either failed or been significantly modified following resistance and opposition from some stakeholder groups (Voyer *et al.*, in press). MPA opponents in NSW were mobilized into more active opposition by their belief that recreational fishing had minor/no environmental impacts and that MPAs were an irrelevant management response to the actual threats to marine biodiversity. People's environmental concerns can focus at the local or global scales (NSW Government and OEH, 2013), and those in the former group are unlikely to be swayed by high profile public conservation campaigns that focus on global environmental issues and Australia's and individual's responsibilities to solve them. A wider lesson from the NSW experience is that a proposal for an MPA needs to be clearly explained and justified in ways that recognise that local communities are comprised of people with a variety of perspectives on the identity, magnitude and scale of issues for biodiversity.

Regardless of the consultation process used or strength of the arguments and evidence justifying the need for some form of state control of people's use of the marine environment or for a more relaxed approach to management, there will be opponents to either position. Many of the arguments opposing MPAs in NSW were based on a refusal to accept any form of restriction of an individual's right to catch fish. There were also arguments, held with a similar intensity, that marine biodiversity was not a resource and that no-take MPAs are the only way to protect it. These ideologies are not amenable to compromise through debate or information. Public consultations, impact assessment and planning cannot be judged by their success or failure to meet the goals of either of these viewpoints. The NSW experience showed that regardless of the high level of community support for MPAs and no-take zones that was evident from community surveys, their validity was effectively

contested. Some of the criticisms were warranted because of poor scientific justification for some planning decisions that unfortunately led to the whole concept of MPAs being tarnished. A wider lesson from this experience is that consultation processes and impact assessments should be designed so that the full range of views and experiences are sought and considered and not overcome by the arguments of extreme positions. Without this these processes are at risk of becoming battlegrounds for influence over the public and political decision-makers.

Recreational fishers, as one stakeholder group with a concern for environmental protection, were marginalized by the approach that focused only on the establishment of MPAs and no-take zones as the most visible response to threats to biodiversity. Valid criticisms were raised about some of the scientific evidence promoted by management authorities to justify no-take zones. The use of arguments about the benefits for fisheries that would flow from marine parks planned for biodiversity conservation, despite the fact that the marine parks were designed for biodiversity conservation and that there was little compelling evidence for fisheries-related benefits, to win over opponents in the fishing sectors further weakened these justifications. Wider lessons from this aspect of the NSW experience are that the aims of MPAs have to be clearly explained and the scientific evidence used to justify the use of MPAs to achieve those aims has to be critically reviewed for its relevance, appropriately applied, and its limitations have to be explained.

Despite some recent research (e.g. Voyer *et al.*, 2013a) the social impacts of MPAs on recreational fishers in NSW are poorly known. The NSW experience revealed that community consultation and education programs are not effective at minimizing social impacts of MPAs. It also revealed that, while there was considerable bio-physical understanding of the marine environment, the lack of social understanding has probably exerted a greater influence on the fate of NSW's MPAs. A lesson for other jurisdictions is that separate social and economic assessments need to be undertaken as part of initial information gathering (and at the same time as information gathering on biodiversity values and environmental issues) and all sources should inform decisions about whether or not to establish an MPA in an area.

The campaign of opposition to some of the planning decisions in marine parks, and the questioning of the need for marine parks, by recreational fishers and some scientists was the dominant force behind the changes that have occurred in NSW. The changes that occurred in NSW, and the arguments used to force these changes, have been taken up in other Australian states. A different approach to the assessment of impacts from establishing MPAs that includes ecological, social and economic aspects as part of a proper impact study, innovative consultation processes that actively seek out a range of views rather than current approaches that are susceptible to domination by a few unrepresentative and uncompromising views, an expansion of the goals of MPAs beyond primarily biodiversity conservation to include fisheries management, and a critical appraisal of the risk-based approaches currently being advocated is more likely to lead to a more durable approach to conservation of marine biodiversity.

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