

Measuring the economic, social, cultural and environmental value of Marine Protected Areas in New South Wales

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Marine protected areas, marine parks, economic, social, cultural effect, aboriginal, marine environment.

Abstract

New South Wales has a system of Marine Protected Areas (MPA) which encompasses a large area of coastline in the form of Marine Parks, Aquatic Reserves and protected estuarine and oceanic habitats. These MPAs have been established to provide a means to manage the marine estate, support marine science and education and conserve biodiversity. While the main aim of an MPA is protection of the marine environment, visitors and community members can still enjoy a broad range of activities within MPAs including fishing, swimming, surfing, boating and diving. However, specific forms of commercial and recreational fishing are limited to protect biodiversity and habitats. Although many activities are permitted in the MPAs some community groups feel they have been ostracised by the banning of fishing or other activities in certain areas such as aquatic reserves and sanctuary zones. There is also general confusion about what can and can't be taken from a Marine Park. This confusion has led to political debate over recent years as to whether or not MPA really make any difference to the conservation of marine life. Raising fears they are just another way of impinging on the rights of fishers and other aquatic users. This paper examines the value of MPAs as a tool for managing the biodiversity of the estuaries and marine zones included within a Marine Park, Aquatic Reserve, National Parks and Nature Reserves. The economic, social and cultural effect MPAs have on various community and cultural groups such as fishers, divers, surfers and indigenous persons is also studied. Particular emphasis is placed on educating the community on the values and threats (if any) of balancing the needs of the community and protecting the marine environment for the use and enjoyment of future generations.

Introduction

Australia has the world's largest network of Marine Protected Areas (MPAs) which covers around one third of Australian waters (DoE 2014). NSW MPAs make up a small but important part of that network. These MPAs have been established to provide a means to manage the marine estate, support marine science and education and conserve biodiversity. Although many activities are permitted in the MPAs some community groups feel they have been excluded by the banning of fishing or other activities in certain areas such as aquatic reserves and sanctuary zones. There is also general confusion about what can and can't be taken from a Marine Park. This confusion has led to political debate over recent years as to whether or not MPA really make any difference to the conservation of marine life. Raising fears they are just another way of impinging on the rights of fishers and other aquatic users. However, whilst protecting the marine environment is paramount some stakeholders feel they have not been consulted whilst others feel totally alienated by the process. This paper examines the importance of MPAs as a tool for managing the biodiversity of the estuaries and marine zones within a Marine Parks and Aquatic Reserves whilst balancing community needs and expectations.

Marine Protected Areas

The declaration of marine protected areas is a fundamental part of ecosystem-based management. In 1992 the *Convention on Biological Diversity* called for nation states to establish marine protected areas for the conservation and sustainable use of threatened species, habitats, living marine resources and ecological processes (*Convention on Biological Diversity 1992*, Article 8 (a), (b) and (e)). Since then Australia has set aside a large number of marine areas for protection under various State and Federal legislation. By the late 1990s the number of MPAs increased following their inclusion as a core component of Australia's premier policy document for offshore areas the *1998 Oceans Policy* (Gullett 2003).

MPAs in NSW come in a number of forms including aquatic reserves, marine reserves and marine parks. The key criteria identified for establishing MPAs are that they contain a comprehensive, adequate and representative sample of marine biological diversity (MPA 2008). For many years Australia's marine environments have been impacted by a wide range of human activities such as over fishing, coastal development, catchment activities, pollution and introduced marine pests particularly from ballast water. Over time this has contributed to the loss of habitats such as seagrasses, mangroves, macro-algal reefs, and a reduction in the numbers of some species to such an extent that they become threatened or endangered (Jackson 2001).

Over fishing and considerable by-catch over many decades has resulted in a significant reduction in the size structure, abundance and productivity of many commercially harvested fish species. In addition to the capacity to significantly reduce the natural size structure and composition of fish populations, some fishing methods can have considerable cumulative impacts on non-commercial by-catch species, threatened and protected species and communities, and marine habitats.

Legislation

MPAs are marine areas set aside under legislation for special management and are an important part of marine estate management. Whilst in NSW, marine areas can be protected as marine parks or aquatic reserves, the boundaries of some national parks

may also extend into aquatic areas. These areas and some rivers may be protected under the *National Parks and Wildlife Act 1974* (NSW). The Commonwealth also protects some marine areas which fall within its jurisdiction under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth).

Aquatic Reserves in NSW are declared by the Minister for the Environment under Part 7 of the *Fisheries Management Act 1994* (NSW) (Protection of Aquatic Habitats) to conserve the biodiversity of fish and marine vegetation. Aquatic reserves have similar objectives to marine parks, but are generally smaller. There are presently twelve aquatic reserves across NSW with ten of them in the Sydney region with one at Bushrangers Bay south of Sydney and the other at Cook Island near the border of NSW and QLD.

Marine Parks in NSW are regulated under the *Marine Parks Act 1997*. Section 3 defines the objects of Act as follows:

- (a) to conserve marine biological diversity and marine habitats by declaring and providing for the management of a comprehensive system of marine parks,
- (b) to maintain ecological processes in marine parks,
- (c) where consistent with the preceding objects:
 - (i) to provide for ecologically sustainable use of fish (including commercial and recreational fishing) and marine vegetation in marine parks, and
 - (ii) to provide opportunities for public appreciation, understanding and enjoyment of marine parks.

Permits

Permits can be issued for various activities such as research, aquaculture, Aboriginal cultural fishing or other prescribed purpose in a MPA. These permits are issued either under *Fisheries Management Act 1994* or *Marine Parks Regulation 2009* (NSW). Under s37 *Fisheries Management Act 1994* (NSW) the Minister may issue a person a permit which authorises them to take and possess fish or marine vegetation for research or other authorised purposes. This includes Aboriginal cultural fishing purposes (s37(c1)).

Under the *Marine Parks Regulation 2009* (NSW) a restricted number of permits can be issued for the carrying out of an activity in a marine park. In making a determination under this clause, the relevant Ministers must have regard to any existing use within the marine park or zone as at the time the marine park or zone came into existence, the environmental, cultural, social or economic impact of the activity, and whether or not any such activity is consistent with the assessment criteria. A marine parks permit cannot authorise any activity which is contrary to the *Fisheries Management Act 1994*.

Benefits of MPAs

Scientific studies have shown that by protecting certain marine areas not only was there a reduction in the loss of threatened and vulnerable species, but there were also benefits such as an increase in the abundance, biomass, diversity and productivity of many organisms. A Tasmanian study of marine reserves discovered when fishing was removed from certain areas natural productivity returned to levels higher than expected, suggesting the impact from overfishing on Tasmania's rocky reefs was far greater than first thought (Edgar 1999).

A 2004 NSW Department of Primary Industries (DPI) study identified a number of species as having a high to moderate risk of population decline as a result of fishing pressure. Many of these species are sharks, which are particularly vulnerable because

of their slow growth, low recruitment and long life span (NSW DPI 2004). Fishing has contributed to the significant declines in population numbers of species now listed as endangered, such as the grey nurse shark (*Carcharias taurus*) (Otaway et al 2004).

Indirect changes to marine habitats can also occur due to the removal of target and by-catch species. One example is the development of barren reef areas due to the over-grazing of macro-algae by sea urchins caused by the reduction of urchin predators due to fishing. Such barren areas are estimated to cover around 50% of shallow rocky reefs along the central and southern NSW coast (Andrew 2000).

Five sanctuary zones in the Ningaloo Marine Park in Western Australia compared areas where recreational fishing was permitted but commercial fishing prohibited. Significantly greater biomass, size, and abundance of legal-sized emperors (Lethrinidae) were found in the sanctuary zones, but no differences in other families/genera (Westera 2003). Shears et al (2006) found similar trends in the abundance of the spiny lobster (*Jasus edwards*) in New Zealand. Legal sized lobsters were 11 times more abundant and biomass 25 times higher in the no-take MPA. However in the MPA where commercial fishing was excluded but recreational fishing was permitted there has been no significant change in lobster numbers. Four sanctuary zones around the Palm and Whitsunday Islands in Queensland were shown to contain around four to six times the density and abundance of coral trout (*Plectropomus* spp) compared to similar unprotected fished areas (Williamson et al 2004).

In more recent studies Edgar et al (2014) found MPAs often fail to reach their full potential as a consequence of factors such as illegal harvesting, regulations that legally allow detrimental harvesting or emigration of animals outside boundaries because of continuous habitat or inadequate size of reserve. They also found the efficacy of MPAs was strongly influenced by the five planning and management features (no take, enforced, old, large and isolated or NEOLI), with MPAs that scored highly with multiple NEOLI features typically having highly elevated biomass of exploitable fishes compared to fished sites (Edgar et al 2014).

This work and that of other marine scientists provides an insight into the importance of marine conservation. As the health of the world's oceans continues to decline, resource management agencies, policy makers, conservation organisations and other stakeholders are increasingly turning to marine protected areas for support (Smyth et al 2003).

Zoning

Marine parks in NSW are divided into zones that have specific fishing restrictions placed on them by the *Marine Parks (Zoning Plans) Regulation 1999* (NSW). The following zones and restrictions may be found in marine parks:

- Sanctuary zones - provide the highest level of protection for biodiversity and do not permit fishing, collecting, dredging, aquaculture or mooring on designated sites;
- Habitat protection zones - also provide a high level of protection, but allow for some recreational and fishing activities which do not harm habitat or affect fish populations;
- General use zones – allows for fishing that is in accordance with the specific marine park management plan; and
- Special purpose zones – allows for fishing that is in accordance with the specific marine park management plan.

An example of the zoning in the Batemans Marine Park is as follows:

- Sanctuary zones make up around 19% of the total area. Recreational fishing is prohibited however swimming, diving, sailing and snorkeling are permitted;
- Habitat protection zones make up around 43%. Recreational fishing and some commercial fishing are allowed;
- General use zones account for around 37% of the total area. Most recreational and commercial activities are permitted as long as they are ecologically sustainable;
- Special purpose zones make up approximately 0.4% of the area and allow for activities such as aquaculture and research¹.

As can be seen many activities including fishing can still be undertaken in most areas of a Marine Park.

Community Consultation and opposition

Although the scientific literature overwhelmingly supports the use of MPAs as a method of preserving marine biodiversity it may be surprising that anyone would oppose them. However, there are many strong opponents to the MPAs mainly from the recreational fishing groups.

With the declaration of the Batemans Marine Park on the Far South Coast of NSW in 2006 some of the consultancy meetings between various stakeholders became outright hostile. One submission was from the *Narooma Port Committee* who professed to be informal representatives of the interests of the recreational and commercial line fishermen, charter boat operators and tackle stores in Narooma. They argued the key issue was the financial effect the then proposed Marine Park would have on the tourism industry. The submission stated that the current *exceptional pressures* on Australian fish stocks and coastal biodiversity were not caused by fishing but from pollution, introduced organisms and inappropriate coastal development. A Report to NSW Recreational Fishing Saltwater Trust by McIlgorm et al (2005) found the financial and flow-on benefit to the Narooma and Bermagui community from recreational fishing was calculated at \$36.5 million in 2004. What this submission did not consider was the other tourist attractions to the area that would be enhanced by the Marine Park. These include diving, kayaking, snorkelling, swimming, camping and adventurer boating such as whale watching.

A 2006 report found that fishers surveyed in the Narooma/Bermagui area spend most of their time fishing offshore (69%) particularly in waters more than 3nm miles offshore (47%) (an area which is not affected by the marine park). Only 17% of their time was spent fishing inland, mostly Wagonga Inlet, and another 13% fishing off beaches and rocks (Ernest Young, 2006). Considering the sanctuary zones makes up only around 19% of the total area of the marine park and most fishers are going off shore, the impact on their fishing appears to be minimal (MPA 2014).

Opposition to the Batemans Marine Park continues and many of its key opponents have remained engaged in actively lobbying the State government for changes to marine park management throughout the state and for zoning plans to be overturned or reviewed. This lobbying has resulted in two public inquiries into marine parks in the last four years, the passing of a moratorium on new marine park declarations and the reversal of zoning plan changes made to two NSW parks prior to the last state election (Hodgkinson and Parker, 2011).

¹ Note: Percentages for zones may not add up to 100% due to rounding.

Social implications

Addressing social and economic considerations is crucial to the success of MPA planning and management. Ineffective social assessment can alienate local communities and undermine the success of existing and future MPAs (Voyer 2011). Cognitive science has demonstrated that simply informing people of the facts is not enough to convince them of appropriate responses. People are primarily motivated by their own agendas driven by unconscious and emotional logic, and unless the facts make sense in their terms, they will be ignored (Lakoff, 2010).

Resistance to MPAs is likely to be motivated by a broad range of other factors among a variety of stakeholder groups, including recreational fishers (Chuenpagdee et al, 2013). Perhaps because recreational fishers are less likely to rely on fishing for their livelihoods there has been less research attention on the social impacts of MPAs on this group (Voyer et al 2014). Aligning particular policy or management positions with ideology is not uncommon in news media. Environmental causes are often seen as the domain of progressive parties, while conservative ideologies are more commonly associated with resistance to environmental actions (Lakoff 2010).

Interviews conducted by Voyer et al (2014) found that opponents believed the marine park had affected their lives to varying degrees. Recreational fishers were affected mainly through inconvenience and loss of enjoyment. Professional fishers reported quite profound impacts on their livelihoods, lifestyle and wellbeing. Fifty three fishers were interviewed of which forty two were opposed to MPAs (Voyer et al 2014). These opponents represented themselves as knowledge holders built on personal experience handed down through generations. When contrasting their practical knowledge with the academic knowledge of the scientists involved in the planning process they suggested that their knowledge was not respected or acknowledged despite the many opportunities for involvement. They considered themselves environmentally aware, local custodians who had minimal impacts on the environment and did not deserve the *punishment* of the marine park (Voyer et al 2014).

Understanding the reasons people fish may also provide some insight into how social impacts could be mitigated or compensated in a more meaningful way. Highly specialised fishers maybe motivated by the physical and mental act of catching the fish rather than the end product of the fish (Voyer et al 2014). The development of strategies to compensate for the loss of some fishing enjoyment, such as providing artificial reefs to allow for a diversity of experience (Beeton et al 2012) may also be useful in engaging highly specialised fishers and harnessing their potential as opinion makers within the recreational fishing community. However, further research is required into the needs and aspirations of fishers along the full range of specialisation (Voyer et al 2014).

Economic value of MPAs

There are a number of direct and indirect uses of marine parks generating a range of economic values for the community and associated regional economic impacts for local economies. The main uses of marine parks as identified in this study include commercial or other market activities and non-commercial or non-market activities. Most common commercial activities in marine parks include fishing charter operators; commercial fishing; commercial dive tours; whale and dolphin watching charters; other sight-seeing tours; surf schools; and canoe and paddle board hire. Most Non-commercial or non-market activities in marine parks include recreational fishing; private boating; research and education; beach, rocky shore and headland walks; scuba

diving; snorkeling; surfing; and camping. Ecosystem function values of a marine park may include fish stock recruitment and protection; habitat and biodiversity maintenance; and waste treatment (McGregor 2008).

The correct measures for estimating these values include consumer and producer surplus, net costs to government and flow-on effects or multipliers to the regional economy. The true economic value provided by a marine park is measured as the marginal change in the value of these uses resulting from protection (MPA 2004). Surveys conducted in the Solitary Islands and Jervis Bay marine parks in NSW found broad community support for their local MPA with the majority of respondents (87% and 84% respectively) in favour of conserving the marine parks (McGregor 2008).

Aboriginal Cultural Fishing

In 2014 Voyer interviewed fourteen indigenous fishers from the Worimi nation (mid north coast of NSW) and the Yuin nation (NSW Far South coast) in relation to the effect marine parks had on their cultural fishing. They felt the parks had severely affected their ability to practise their culture rituals, seeing them as a continuation of prejudice and discrimination against Aboriginal people. For cultural fishers the main concerns in relation to the marine park were the restrictions it had placed on cultural use and accessibility to fresh seafood, which they said was an essential component of the local Aboriginal people's diet (Voyer 2014). Authorities have endeavoured to take this into account when establishing marine parks and reserves.

Aboriginal people in NSW may undertake Aboriginal cultural fishing without a license wherever recreational fishing is permitted, including general purpose areas of marine parks (s34C 2 (f) *Fisheries Management Act* 1994). In keeping the special nature and importance of cultural fishing the Marine Parks Authority has developed a policy titled *Aboriginal engagement and cultural use of fisheries resources policy* that outlines a number of options that Aboriginal people can pursue to negotiate to use marine parks for cultural purposes.

However permits may be required by Aboriginal people who wish to undertake cultural activities that involve taking fish contrary to the marine parks and fisheries laws, including bag limits, fishing closures, gear and method restrictions. The two main permits are those under the *Marine Parks Regulation 2009* and s37 permits under the *Fisheries Management Act* 1994. A different management and permit system exists for Commonwealth marine reserves and parks managed under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth).

The Marine Park Authority has a memorandum of understanding with local Aboriginal communities regarding their involvement in the management of a marine park (NSW ALC 2011). Aboriginal people can request a short-term permit to undertake cultural resource use that involves fishing contrary to marine park and fisheries laws. For example specific community and cultural events and gatherings including cultural camps. Event based permits do not normally authorise fishing in sanctuary zones, the harvesting of protected species or the use of fishing gear and methods that are not allowed in the marine park zone where the activity is to occur (NSW ALS 2011).

There are positions for Aboriginal persons on local marine park advisory committees. These committees provide advice to the Marine Park Authority and Ministers on the zoning and management of each Marine Park. Aboriginal people are encouraged to nominate for membership when vacancies arise. The Marine Park Authority will establish and support an Aboriginal Advisory Group for each marine park at the request of Aboriginal people. This group discuss how to manage issues of concern to the community in relation to the marine park (MPA 2014).

Education

Community understanding and education are central to the effective management of marine parks. However, some fishers have resisted marine park planning and declarations since the first parks were declared in 1998. Some find trying to educate them offensive as they feel it dismisses their own knowledge, seeing over simplified messages, such as marine parks and sanctuary zones are good for fishing, as deceitful and patronising (Voyer et al (2) 2013). The value and role of sanctuary zones in particular needs to be communicated in an honest and open way, even if it means the messages are more complex (Voyer et al (2) 2013). Changing the views of some people may be difficult. However, education should be encouraged by those who want to learn about the benefits and opportunities MPAs offer.

There is no shortage of useful information available to the general public and the Marine Parks Authority provides a number of excellent resources via the website. The three most useful are zoning maps for each Marine Park, the *Recreational Fishing in NSW Marine Parks Guide* and the NSW Marine Parks Education Kit for primary schools. Each boat ramp within a MPA also has a map of the local area including zoning. The Department of Primary Industries website also provides a comprehensive guide to MPAs in NSW.

Conclusion

Australia has made a commitment to ensure the protection of marine biodiversity and ecological processes, and to the sustainable use of marine resources through the principles and goals of ecologically sustainable development. Marine protected areas aim to conserve marine biodiversity and habitats whilst providing opportunities for sustainable fishing, public appreciation and enjoyment and play a crucial role in safeguarding the rich diversity of life in our oceans. MPAs have been developed on the basis of sound scientific evidence that MPAs (in particular sanctuary, conservation or no-take, zones) to protect and enhance marine biodiversity and provide a useful tool for the sustainable management of some fisheries.

It is not possible to please everyone in the community in relation to changes such as these, but if we are to conserve marine life for future generations then some hard choices must be made. Specialised fishers may feel they have been driven from their favourite fishing site. Although special consideration has been made to ensure Aboriginal people have some access to cultural fishing practices, they may still feel disadvantaged. However, overwhelmingly the community supports MPAs and without them the future of our marine ecosystems and resources looks bleak.

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