



LARGE-SCALE EXPANSION OF MARINE PROTECTED AREA NETWORKS: LESSONS FROM AUSTRALIA

James A. Fitzsimons^{1,2*} and Geoff Wescott²

*Corresponding author: jfitzsimons@tnc.org

¹The Nature Conservancy, Suite 2-01, 60 Leicester Street, Carlton VIC 3053, Australia

²School of Life and Environmental Sciences, Deakin University, 221 Burwood Highway, Burwood VIC 3125, Australia

ABSTRACT

Australia was one of the first countries to declare a marine protected area (MPA) in 1879, but it was not until the 1960s and 1970s, in efforts to protect the Great Barrier Reef, that marine protection was considered in a concerted way. The more recent development of MPA networks (or systems) by governments in state, territory and national (Commonwealth) jurisdictional waters has again placed Australia in the global spotlight in MPA development. We assembled the experiences of MPA representatives from government agencies, non-government organisations, academia and industry (in the form of commissioned written book chapters) to describe various aspects of MPAs in Australia, from the history, successes and challenges in creating jurisdictional networks, to the science, economics and legal aspects of Australian MPA networks, to different sectoral perspectives. Key themes are discussed and include: 1) Marine protected areas are always contested (at first), 2) Jurisdiction-wide network declaration versus single MPA declarations, each have pros and cons, 3) For federal systems of government, coordination between the jurisdictions is important, 4) Fishery reserves as the first MPAs ‘muddy the waters’ for the objectives of modern MPAs, 5) A multitude of categories and zones and uses has also confused the MPA concept, 6) Multi-use versus no take: proving the benefits and the need for clear targets for each type, 7) Acknowledging the gap between pure science and realpolitik in the placement of MPAs, 8) Involvement of Indigenous communities in MPAs has been slower than for terrestrial protected areas but improving. The recent and substantial changes to the Australian Government’s historic 2012 declaration of a network of MPAs across its exclusive economic zone are also discussed.

Key words: marine protected areas, marine parks, protected area networks, zoning, marine conservation, land use allocation

INTRODUCTION

Australia was among the first countries in the world to establish a national park on land, with the Royal National Park near Sydney declared in 1879. Less well known is that the Royal National Park included an area of intertidal and close inshore marine areas, constituting what could be the oldest marine protected area (MPA) (in the modern sense) in the world (Brown, 2002), noting that there were traditionally managed marine areas managed for conservation in other parts of the world pre-dating this.

Although the national park network (or system) grew in popularity on land and expanded progressively since that early declaration, it was not until the late 1960s and early 1970s when there were proposals to drill for oil on the Great Barrier Reef that serious attention was paid to establishing protected areas in marine waters in Australia. The declaration of the Great Barrier Reef

Marine Park in 1975 drew international attention to Australia at the time. The more recent development of MPA networks¹ by governments in state, territory and national (Commonwealth) jurisdictional waters has again placed Australia in the global spotlight in MPA development.

Australia is an island continent with an ocean territory that is the third largest on Earth and Australians are mostly coastal dwellers – 85 per cent of Australians live within 50 km of the coast (Trewin, 2004). Today, Australia has more than 327,790,000 ha of sea declared as MPAs, comprising almost 36 per cent of its waters. This represents a nearly five-fold expansion from 7.1 per cent in 2002 (Taylor et al., 2014). The global coverage of MPAs in late 2014 was 3.4 per cent of waters reserved (Spalding & Hale, 2016; up from 1.6 per cent in 2010, Tratham et al., 2012). Marine national parks and other highly protected areas (IUCN Categories I–III) grew

nearly seven-fold, to cover from 2 per cent to 13.5 per cent of Australian waters, up to 2014 (Taylor et al., 2014) (Figure 1 – but see ‘Recent developments’ section below).

Like the approach on land, the development of MPA networks in Australia has, over the past two decades, been guided by the principles of comprehensiveness, adequacy and representativeness, using bioregions as a basis to guide priorities (ANZECC TFMPA, 1998; Commonwealth of Australia, 2006; Australian Government, 2007). As a federated nation, the six state governments and the Northern Territory generally have responsibility for waters within 3 nautical miles of the coast and the (federal) Australian Government for waters beyond 3 nautical miles within Australia’s Exclusive Economic Zone. Thus, separate MPA networks have been created for each of these jurisdictions under different approaches, policies and legislation, but with the more recent aim of a more consistent and uniform approach to MPA network principles.

However, the establishment of MPAs has not been without controversy and, in some cases, a decline in political support. Despite the significant activity, discussion and debate around MPAs in Australia, there have been few attempts to bring together the history, current status and future directions of each of the Australian MPA networks (national, territory and state) or to align different perspectives from the various sectors on MPA concepts more broadly. To fill this void, a recent project has assembled the experiences (in the form of commissioned chapters for a book, *Big, Bold and Blue: Lessons from Australia’s Marine Protected Areas* (Fitzsimons & Wescott, 2016), of MPA representatives from government agencies, non-government organisations, academia and industry to describe various aspects of MPA networks in Australia. These experts were chosen by the authors based on their strong knowledge of the particular topic relating to MPA networks (e.g. Indigenous involvement, legal frameworks, etc.) and/or involvement in creating MPA networks in different jurisdictions, and they were asked to write to predefined chapter templates. This book covered from the history, successes and challenges in creating jurisdictional networks (in states and Northern Territory coastal waters within 3 nautical miles and in Australian Government-controlled waters – Australia’s Exclusive Economic Zone beyond 3 nautical miles, the Great Barrier Reef and Australia’s Antarctic and sub-Antarctic waters), to the science, economics and legal aspects of Australian MPA networks to different

sectoral perspectives (Fitzsimons & Wescott, 2016). The findings from these chapters are synthesised in this paper based on the common themes raised.

As most countries around the world seek to build their MPA networks in response to commitments they have made under the Convention on Biological Diversity, the lessons from Australia are likely to be even more timely. Past compilations of differing perspectives of MPA development and implementation have either been at a more general level (e.g. Claudet, 2011; Day et al., 2015) or are not particularly recent (e.g. Beumer et al., 2003). This paper seeks out common lessons, both positive and negative, acquired from the Australian experience during the recent rapid expansion of MPAs, particularly over the past two decades.

KEY THEMES

There were a number of clearly recurring themes and lessons that emerged from the analysis of lessons for creating MPA networks in Australia, as well as points of difference. These are described under separate headings below.

Marine protected areas are always contested (at first)

In almost all Australian jurisdictions, and particularly in the last two decades, the establishment of MPAs, either singly or as part of networks, has been contested, especially where this has placed restrictions on fishing or other extractive industries (e.g. Wilson, 2016; Thomas & Hughes, 2016; Wescott, 2016; Clarke, 2016; Edyvane & Blanch, 2016; Meder, 2016). This contestation is reflected in other countries as well (e.g. Spalding & Hale, 2016). In Australia, for example, approximately 740,000 submissions were received in the public consultation periods process for the establishment of the Commonwealth Marine Reserve networks and related management plans (prior to their review in 2017) (see also Wescott & Fitzsimons, 2011). The majority of these were campaign submissions (both for and against the marine reserve networks proposals; Cochrane, 2016; Smyth, 2016). This contestation involved non-coastal waters that most Australians have never seen, or are likely to ever visit. The subsequent review of the reserve network (and further rounds of public consultation) was prompted by the considerable pressure from user groups, with the appointment of two “expert panels [to] help restore confidence in Commonwealth marine reserves” by providing “advice to the [Australian] Government, based on the best available science and after genuine consultation with stakeholders” (Hunt & Colbeck, 2014).

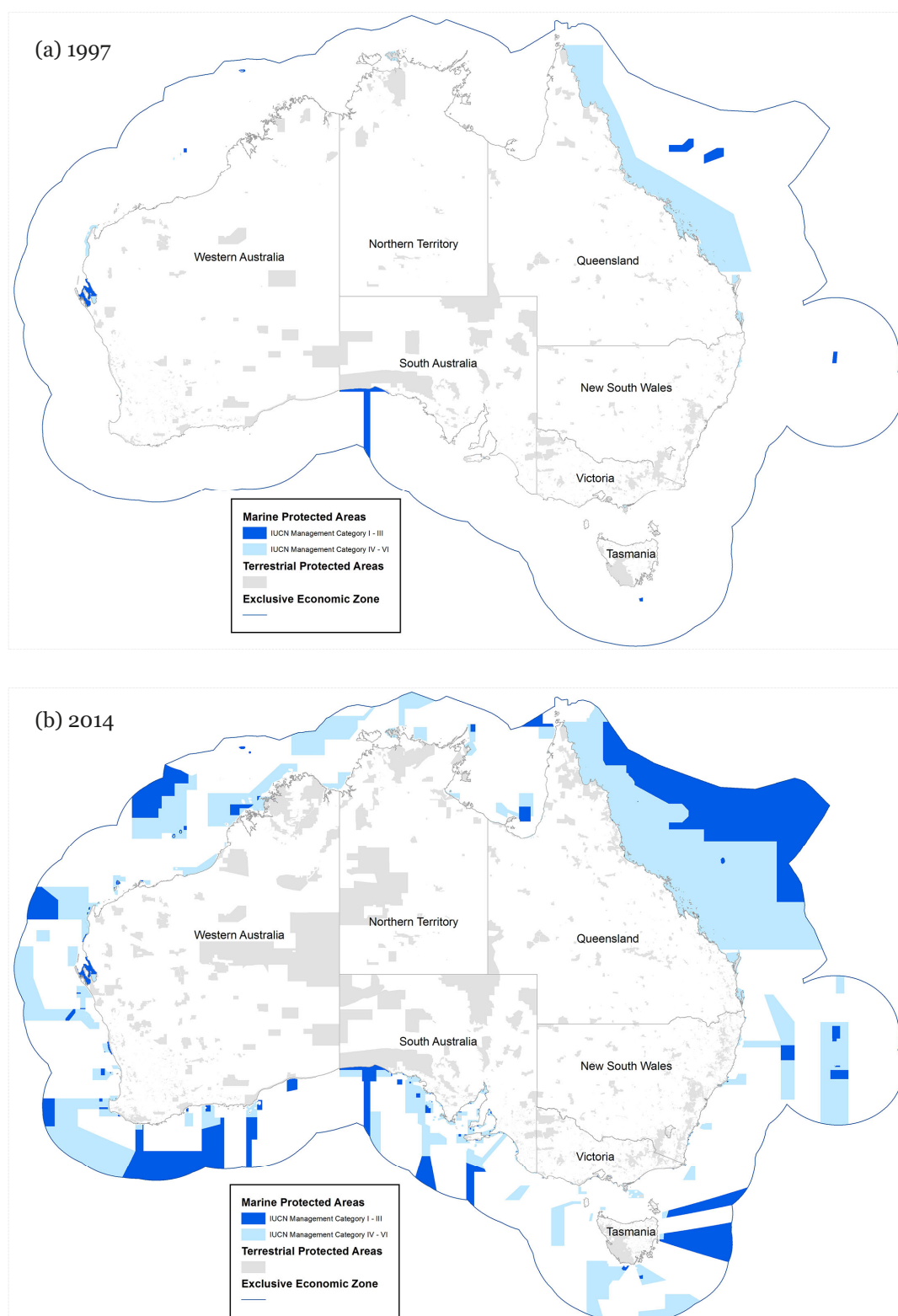


Figure 1. Australia's Marine Protected Area estate in a) 1997 and b) 2014. External waters of Heard and McDonald Islands, Macquarie Island, Norfolk Island, Christmas Island and Cocos (Keeling) Islands not shown. Note changes to some zones occurred post 2014 (see Figure 7c). Source: Collaborative Australian Protected Areas Database Marine 2014 (Department of the Environment, 2014)

This resistance has been driven by fishing groups in particular, despite apparent strong public support for MPAs in principle (Meder, 2016). Strong fishing lobbies are considered the reason for the lack of concerted establishment of networks of MPAs in Tasmania and the Northern Territory (Edyvane & Blanch, 2016).

However, experience in other states suggests that this early discontent and negative reactions from fishers and some locals mostly changes to neutral or positive perceptions over 5–10 years after an MPA is established (e.g. Western Australia [Wilson, 2016], New South Wales [Clarke, 2016], Great Barrier Reef [Day, 2016]). Despite this, there have been campaigns by the fishing lobby in some states for an opening up of strict MPAs (Clarke, 2016; Wescott, 2016). This pressure to actually reverse reservation decisions, although relatively unknown in terrestrial protected area systems in Australia, seems to be more common in the marine environment.

Jurisdiction-wide network declaration versus single MPA declarations, each have pros and cons

MPAs in Australian jurisdictions have varied in the way they have been created. These differences in establishment are reflected in legislation, which falls into three main categories: specific MPA legislation, fisheries legislation and general national parks legislation (Techera, 2016).

In most jurisdictions, early MPA declarations were a 'one off', typically protecting a small area of particular interest. The advent of the large, multi-zoned Great Barrier Reef Marine Park with its own legislation, and particularly the 2003 rezoning, heralded the beginning of considering the entire extent of a large portion of Australian waters for MPA network designation at the same time. Victoria was actually the first Australian jurisdiction to systematically consider its entire marine waters for the establishment of a comprehensive, adequate and representative MPA network, declared in 2002. South Australia, the Commonwealth Regional Marine Planning processes and the Antarctic MPA proposals being considered by the Commission for the Conservation of Antarctic Marine Living Resources are other examples of MPA networks created from processes considering the entire jurisdiction at one time. Some states, such as Western Australia and Tasmania, have undertaken systematic reviews and declarations for parts of their jurisdiction (the Kimberley in Western Australia; and southeast Tasmania), whereas New South Wales and Queensland have implemented relatively large zoned MPAs in

various parts of their jurisdiction but have not assessed all of their waters for this purpose. The Northern Territory (with only two marine parks) seems to be the furthest from developing a comprehensive, adequate and representative MPA network (Edyvane & Blanch, 2016).

Establishing an MPA network based on considering the entire jurisdiction (or a large proportion of it) at once has several advantages, including (i) the consideration of the comprehensiveness, adequacy and representativeness of their MPA estate with consistent ecological data and the ability to adjust boundaries to accommodate other uses, (ii) a dedicated process with public consultations and public submissions (see also Wescott, 2006; Coffey et al., 2011). Disadvantages include a potential inability to campaign and make a good case for MPAs over the entire jurisdiction by MPA advocates due to lack of resources or limited public attention (particularly if the region is large) (Smyth, 2016), or claims that resource use stakeholders have not been properly consulted or have become 'drained' by the process (Boag, 2016).

For federal systems of government, coordination between jurisdictions is important

As with many federal nations, Australia divides control over its marine environment between a federal (national) government and governments of states and territories. The result in Australia is that coastal waters (accessible to many recreational and commercial uses by ordinary citizens) come under the state/territory government's control while waters beyond the 3 nautical mile limit (which have more industrial uses and require significant infrastructure and resources to be exploited), in general, come under national government control.

In realpolitik terms, this means that state and territory governments will bear the brunt of any anger and disputes over the loss of access to a previously available resource (e.g. fish) while the national government will see far less pressure from voting members of their electorates.

This results in far more disputation directed at the more poorly resourced state/territory level and hence greater difficulty for state and territory governments in implementing MPAs in Australia. It also means that it can take considerably longer to establish a network of MPAs in coastal waters (see Edyvane & Blanch, 2016; Thomas & Hughes, 2016; Wescott, 2016), where their need is higher because of greater human use impacts, than in national offshore waters (Beaver, 2016).

This would appear to be an argument for the national government to directly (i.e. financially) assist the states in establishing their MPA networks if Australia is to establish a genuine comprehensive, adequate and representative MPA network that considers all the nation's waters.

Fishery reserves as the first MPAs 'muddy the waters' for the objectives of modern MPAs

In most Australian jurisdictions, either the first area-based protection mechanisms covering marine areas were specifically declared to protect fish resources (e.g. nursery grounds, or temporary closures of fisheries to prevent over-fishing); or fishery regulations were used to establish MPAs for biodiversity conservation reasons (perhaps because other legislative/regulatory processes were not available, at the time, for reservation in the sea) (e.g. Harold Holt Reserve in Victoria).

This historical legacy may well be the reason for the continued perception by some, such as those in fishery circles, that MPAs are fishery management tools rather than biodiversity conservation tools (Boag, 2016; Goldsworthy et al., 2016; Wilson, 2016).

This confusion has led to significant heat in the debate about the location of individual MPAs and broader MPA networks, with those from a fishery perspective often debating the need for an MPA in a particular location based on its value for fishery management (Goldsworthy et al., 2016; Wilson, 2016). This in turn creates 'heat' in politicians' and senior decision makers' minds as well – particularly if they see conservation in terms of the sustainable use of natural resources rather than including nature conservation for the intrinsic value of the nature itself (e.g. Taylor, 2013).

Some jurisdictions do have some element of their MPA networks focused on fishery management and this may complicate the understanding of the purpose of MPAs more generally. For example, Queensland's network of Fish Habitat Areas (declared under the *Fisheries Regulation 2008*) consists of 70 declared areas covering more than 1 million ha and is spread across the state, complementing larger, zoned MPAs declared under the *Marine Parks Act 2004* (Ogilvie, 2016). In addition, conservation groups do promote MPAs as a means to prevent overfishing (Boag, 2016; Sheridan, 2016; Smyth, 2016) and it may be that the public also perceive MPAs for that purpose, at least in part (Sheridan, 2016).

This may be a communication problem rather than an institutional one and if the nomenclature system for MPAs and broader sea use classification system (e.g.

Smyth & Wescott, 2016) more clearly separated out the reasons for a specific reservation (e.g. biodiversity conservation, temporary fishery grounds closure, habitat protection for breeding stock, etc.) an area of conflict might be substantially reduced (see also Day et al., 2018 for international IUCN guidance on this).

A multitude of categories and zones and uses has also confused the MPA concept

There are more than 30 different named designations given to MPAs in Australia (e.g. marine parks, marine national parks, marine sanctuaries, etc.). Even where a designation has the same name in multiple jurisdictions (e.g. 'marine park') they might have quite different allowable activities (e.g. New South Wales, Great Barrier Reef, South Australia: Clarke, 2016; Day, 2016; Thomas & Hughes, 2016). This potentially adds to the confusion among the public about what MPAs are and what they are trying to achieve (which is a global problem the IUCN has sought to address through the *Guidelines for Applying the IUCN Protected Area Management Categories to Marine Protected Areas* – Day et al., 2018). It is likely the concept of a 'national park' or 'nature reserve' on land has much greater community understanding of purpose and allowable activities.

There are two general models followed by jurisdictions in Australia for MPAs. One is the zoned MPA model where generally larger MPAs have a variety of legal zones within their outer boundaries, which typically include a mix of high protection (no-take) zones, semi-restrictive zones and zones that are very lightly restrictive of some extractive uses, such as recreation and commercial fishing (Figure 2). The benefits of such an approach (i.e. multiple use in MPAs) is that a greater



Figure 2. Batemans Marine Park in New South Wales, Australia with multiple zones © James Fitzsimons

variety of users can access and appreciate an MPA, including those that are in many cases (initially) opposed to MPAs. Conversely, having such a diversity of activities within a single protected area can make it hard for the public, who are not regular users, to determine an ‘identity’, or specific purpose, for such a sea use. This zoning approach is adopted in Queensland, New South Wales, South Australia, the Great Barrier Reef Marine Park and some of the Commonwealth Marine Reserves.

The historical use of the term ‘marine park’ to describe what was in reality a spatial zoning system with a majority of areas designated for ‘general use’ (i.e. containing few restrictions for the entire Great Barrier Reef Marine Park) certainly confused the public in other jurisdictions in Australia (and perhaps globally) and may well have made it harder to convince the community of the value of MPAs (see Wescott, 2006).

The other model is the non-zoned approach such as Victoria’s no-take system of marine national parks and marine sanctuaries (Wescott, 2016) (Figure 3), and the multi-use but not-zoned MPAs (where certain activities are regulated) in the Northern Territory (Edyvane & Blanch, 2016) and some Tasmanian reserves (Kriwoken, 2016). The benefit of this approach is a clear articulation of the purpose of the reserve or the network (see Wescott, 2006), although these areas are typically smaller and potentially engage fewer users.

The Commonwealth Government, Western Australia and Tasmania have MPAs that are both zoned and not zoned (Cochrane, 2016; Kriwoken, 2016; Wilson, 2016). The proposed East Antarctic Representative System of Marine Protected Areas is based on a ‘multiple use’ approach, where research and exploratory fishing activities would be allowed when they are judged consistent with the maintenance of the objectives of the MPAs and considered sustainable under existing conservation measures (Goldsworthy et al., 2016).

Multi-use versus no take: proving the benefits and the need for clear targets for each type

Much emphasis in the development of MPA networks by scientists and conservationists focuses on the establishment of strict protection MPAs, particularly no-take zones (Kenchington, 2016; Smyth, 2016; Ward & Stewart, 2016). This in part may be due to the historic prevalence of multi-use MPAs (e.g. Costello & Ballantine, 2015) and the clearer ecological benefits of MPAs where there is less human exploitation (e.g. Edgar et al., 2014). There is a current lack of international criteria, or guidance, on the mix of no-



Figure 3. Churchill Island Marine National Park, Victoria, Australia. One of three, non-zoned marine national parks in Western Port that are strict no-take MPAs © James Fitzsimons

take and multi-use in targets such as the 10 per cent Aichi Target 11 of the Convention on Biological Diversity. However, there are moves from other international forums to be more explicit. For example, the final declaration of the 2014 World Parks Congress called for bolder targets – “at least 30 per cent of each habitat type to be afforded strict protection” (although this is not binding), while the 2016 World Conservation Congress supported a motion to encourage IUCN State and Government Agency Members to designate and implement at least 30 per cent of each marine habitat in a network of highly protected MPAs by 2030 (motion #53; <https://portals.iucn.org/congress/motion/053>).

In Australia, the 1998 *Guidelines for Establishing the National Representative System of Marine Protected Areas* pre-dates these international agreements and is silent on percentage targets, but states “NRSMPA will aim to include some highly protected areas (IUCN Categories I and II) in each bioregion” (ANZECC TFMPA, 1998; although, somewhat confusingly, this does not always equate to ‘no take’, see Fitzsimons, 2011). Updating Australia’s national policy to better recognise area/percent-based targets while honouring the existing national commitments to bioregional representation in highly protected MPAs should be a priority.

Acknowledging the gap between pure science versus realpolitik in the placement of MPAs

The principles of comprehensiveness, adequacy and representativeness guide the establishment of MPA networks in Australian jurisdictions and it is the stated

wish that the full range of habitats are included in Australia's MPA network (ANZECC TFMPA, 1998).

The Aichi targets of the Convention on Biological Diversity have included the need for connectivity and consideration of ecosystem services in addition to the representation of habitats. Globally, MPA coverage appears to show some level of inverse correlation with coastal population densities, despite many ecosystem services being tightly linked to local human populations who receive direct benefits from coastal protection, food provision, tourism income, etc. (Spalding & Hale, 2016). Nonetheless, ecosystem services and other socio-economic benefits have been demonstrated for several Australian MPAs (Marshall, 2015; Hoisington, 2016) (Figure 4).

Different groups of people have quite different perspectives on the reasons for declaring MPAs, the methodology and decision-making processes for deciding where to place these MPAs and the various restrictions on use within different categories of MPAs. In particular, there seems to be one most overt dichotomy: the difference between the belief among some that the scientific data should solely determine, or

at least be the primary determiner of (e.g. Devillers et al., 2015), MPA location and extent, and the recognition by interested parties from many different sectors that a range of factors (historical and future uses, social acceptability, etc.) need to be considered in the placement of MPAs.

In the end it is a political decision to determine how, where and when a system of MPAs is to be established for biodiversity conservation purposes, and how this is balanced with other legitimate uses of the sea. Although such decisions are difficult at the best of times (there are going to be clear winners and losers), bipartisan support is usually required to see the declaration of MPAs through a parliament of the relevant jurisdiction. This usually involves some compromises in locations and uses (e.g. Cochrane, 2016; Clarke, 2016; Day, 2016; Wescott, 2016).

If there is not bipartisan, or multi-partisan, political support, then a second level of politics occurs – alternatives are offered up to the electorate complete with electoral tactics of marketing and misleading information. This has certainly occurred in Australia in recent years and, while science is predominantly used to



Figure 4. Great Barrier Reef Coast Marine Park at Cape Tribulation, Queensland, Australia protecting ecosystem services such as shoreline protection © James Fitzsimons

justify the establishment of MPA networks, it is naïve to think science alone will overcome party electoral rhetoric (see ‘Recent developments’ section below).

Involvement of Indigenous communities in MPAs has been slower than for terrestrial protected areas, but improving

Much like the slower development of protected areas in the marine realm compared with the terrestrial realm, recognition of Indigenous rights, ownership and access to sea country has been slower than on land. But this is changing. Legal recognition in the Torres Strait, the intertidal zones of the Northern Territory and various other jurisdictions is seeing greater Indigenous involvement in formal management arrangements, including MPAs (Smyth & Isherwood, 2016).

The current lack of inclusion of Indigenous Protected Areas (IPAs) in marine environments when accounting for progress towards national conservation targets (such as the National Representative System of Marine Protected Areas: ANZECC TFMPA, 1998; Rose, 2012) is inconsistent with the treatment of IPAs on land (where IPAs are considered part of the terrestrial National Reserve System). With the number of sea country IPAs likely to increase, including over existing MPAs such as the Great Barrier Reef Marine Park and Commonwealth Marine Reserves, this policy position seems antiquated and in need of updating (see also Smyth et al., 2016).

FUTURE DIRECTIONS FOR RESEARCH AND POLICY FOR MPAS IN AUSTRALIA

One of the striking contradictions in the attempt to increase MPAs is the outcome of public polling and surveys that suggest strong general community support for declaring protected areas in the marine environment (Meder, 2016; Sheridan, 2016) juxtaposed to the strident public opposition from other interests. Apparently, from the decision-makers’ point of view, the negativity towards declaring MPAs evidenced in the popular media (e.g. Compas et al., 2007) is not offset by the polling which suggests a majority of constituents want MPAs declared (Sheridan, 2016). Exploring the sociological element of the ‘MPA debate’ is a potentially fruitful and useful area for further research.

Clearer guidelines on which reservation targets are being applied are clearly needed at the national and international level (for example, in Australia, are they the ANZECC TFMPA (1998) national policy targets, the Convention on Biological Diversity’s Aichi Target 11 ‘10% in a representative, well connected network’, or the 2016 World Conservation Congress resolution of 30 per cent strict protection, or a combination of these?). The benefits provided by strict protection might be used to set a subsidiary target for no-take MPAs, to ensure the development of a network of sites delivering the highest possible value in terms of biological controls, fisheries enhancement and recreational value.



Figure 5. Twelve Apostles Marine National Park, Victoria, stretches to high-water mark, and adjoins (and overlaps with) the terrestrial Port Campbell National Park which extends to low-water mark © Dean Ingwersen



Figure 6. Macquarie Island Nature Reserve, Tasmania, includes both terrestrial and marine environments © Bob Zuur).

Considering international obligations under the Convention on Biological Diversity to meet spatial targets for protected areas on land and sea, the need for accurate geospatial data is critical for conservation planners and policy makers to assess progress. In developing summary statistics for MPAs in Australia, several significant errors were discovered within Australia's national protected area dataset relating to MPAs (i.e. the 2014 Collaborative Australian Protected Areas Database; Department of the Environment, 2014). These included counting the entire area of several mostly terrestrial protected areas in the marine figures and including most of the Victorian MPA network in the terrestrial geospatial dataset.

Although primarily terrestrial protected areas on the coast may include intertidal areas down to low-water mark (Figure 5), or estuaries, and some MPAs may extend to high-water mark, there are few examples of single protected areas that incorporate significant areas of both land and sea (although notable exceptions include Kent Group National Park and Macquarie Island Nature Reserve [Figure 6] in Tasmania and Nooramunga Marine and Coastal Park in Victoria). This has the impact of fragmenting management, particularly on the coastal fringe where use of an MPA is likely to be most exposed to public use and potential misunderstanding. Here, lessons for government institutions may be drawn from the use and

management of land and sea country by Indigenous Australians. Indigenous Australians do not see a rigid boundary between the sea and the land but a continuum of 'country', which reflects the ecology of the transition far better than rigid legalistic and cultural views of Western-based approaches. At the very least, stronger management of intertidal zones in primary terrestrial coastal MPAs (which occur in all Australian states and the Northern Territory) for their marine values should be considered.

The final observation is that a possible explanation for why it appears to have been so difficult to establish networks of MPAs around the globe may be that the development, understanding and support for marine protected areas lags a century behind terrestrial protected areas (see also Wells et al., 2016). Nonetheless, this 'gap' appears to be rapidly closing.

RECENT DEVELOPMENTS IN MARINE PROTECTED AREAS IN AUSTRALIA

The largest contribution in terms of area to Australia's MPA estate has come from networks of MPAs established in waters controlled by the Australian Government between 3 nautical miles from the coast to the edge of the exclusive economic zone. These MPA networks were established in 2007 and 2012 (Cochrane, 2016) (Figure 7a) and made Australia a world leader with its science-based, bioregional approach and public

consultation process. However, developments since that time, and since the analysis described earlier in the paper, which have seen reductions in high protection zones, have put this reputation, and Australia's conservation of its marine environment, at risk. The developments are outlined below as both an update of the Australian MPA system and to highlight that despite seemingly widespread public support, changes to networks can occur for (partisan political) reasons that are not always made explicit.

Independent Review of Commonwealth Marine Reserves

In 2013, the incoming Australian conservative Coalition Government instigated an Independent Commonwealth Marine Reserves Review through two parallel processes – a review of the science underpinning Commonwealth Marine Reserve management by a five member Expert Scientific Panel, and stakeholder consultation at the national and regional level through the establishment of five Bioregional Advisory Panels. That review started in

September 2014 and was completed in December 2015. The review (which did not include the South-east network) recommended reductions to the size of highly protected zones in the Coral Sea but the addition of some high protection zones elsewhere, negotiating boundary changes to reduce the impact on the fishing sector while maintaining the scientific integrity of the system (Beeton et al., 2015; Buxton & Cochrane, 2015) (Figure 7b). Overall, while the review process recommended retaining the outer boundaries of Commonwealth Marine Reserves, it recommended altering some of the internal highly protected zones (reducing these to 33 per cent of the MPA area, slightly down from the 36 per cent in the 2012 declaration).

Draft Management Plans for Commonwealth Marine Reserves (Australian Marine Parks)

On 21 July 2017, the Australian Government Director of National Parks released draft management plans for Commonwealth Marine Reserves (Figure 7c, Table 1) (with a proposed name change to 'Australian Marine

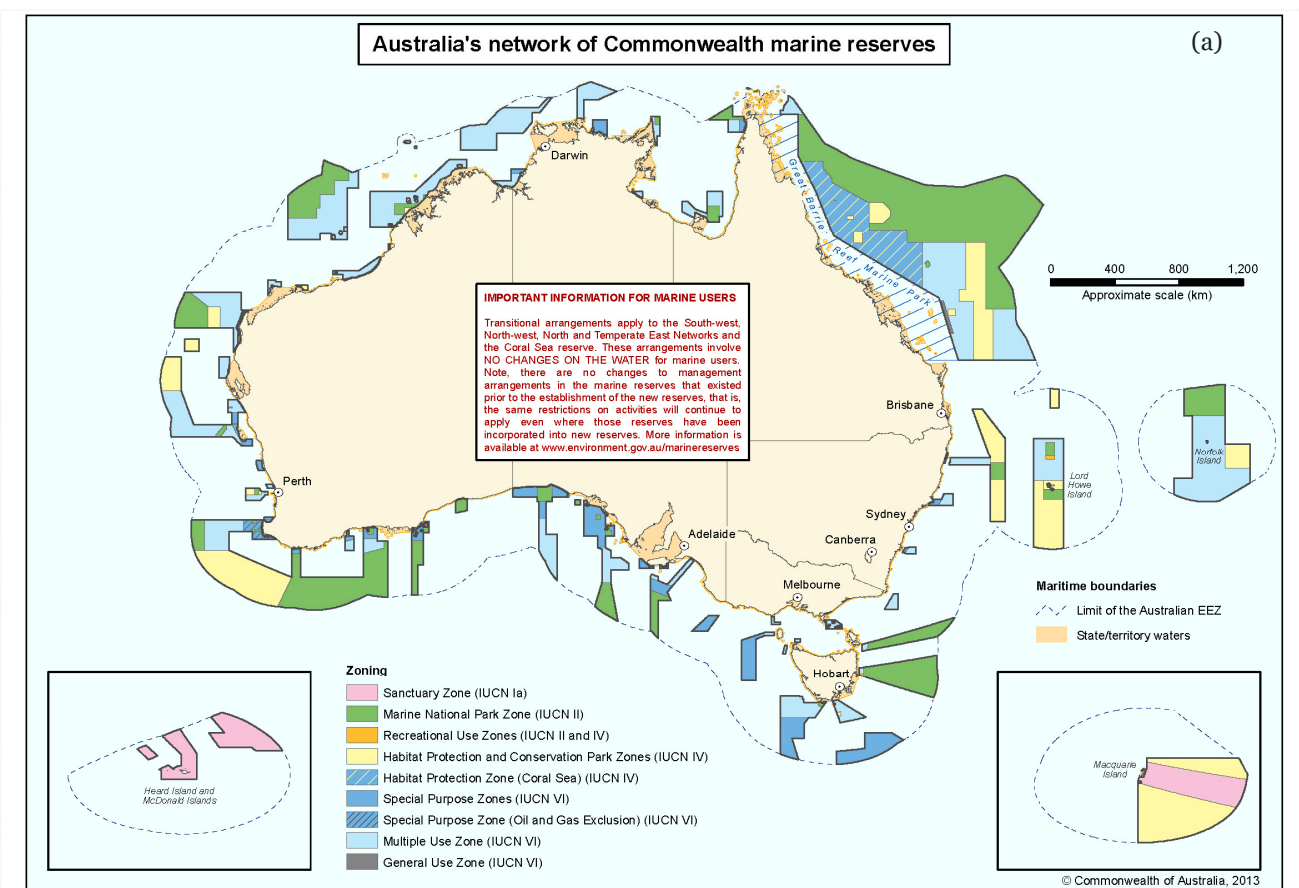


Figure 7 a) Commonwealth Marine Reserves and zoning at 2012 declaration of South-west, North-west, North, Temperate East and Coral Sea networks, b) Recommended rezoning of Independent Commonwealth Marine Reserves Review Bioregional Advisory Panel of these networks, c) Zoning proposed in 2017 Draft Management Plans (accepted by the Australian Parliament in 2018) Source: Australian Government.

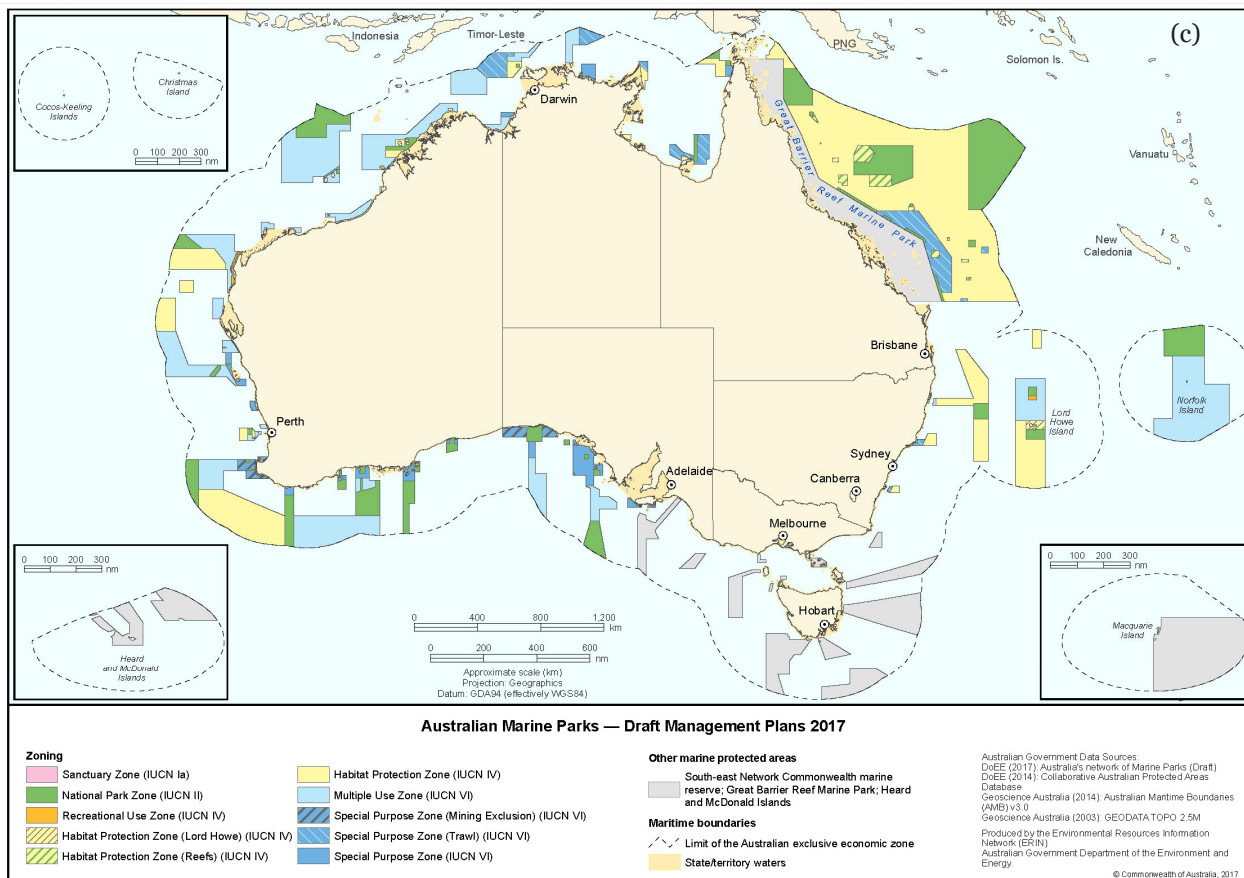
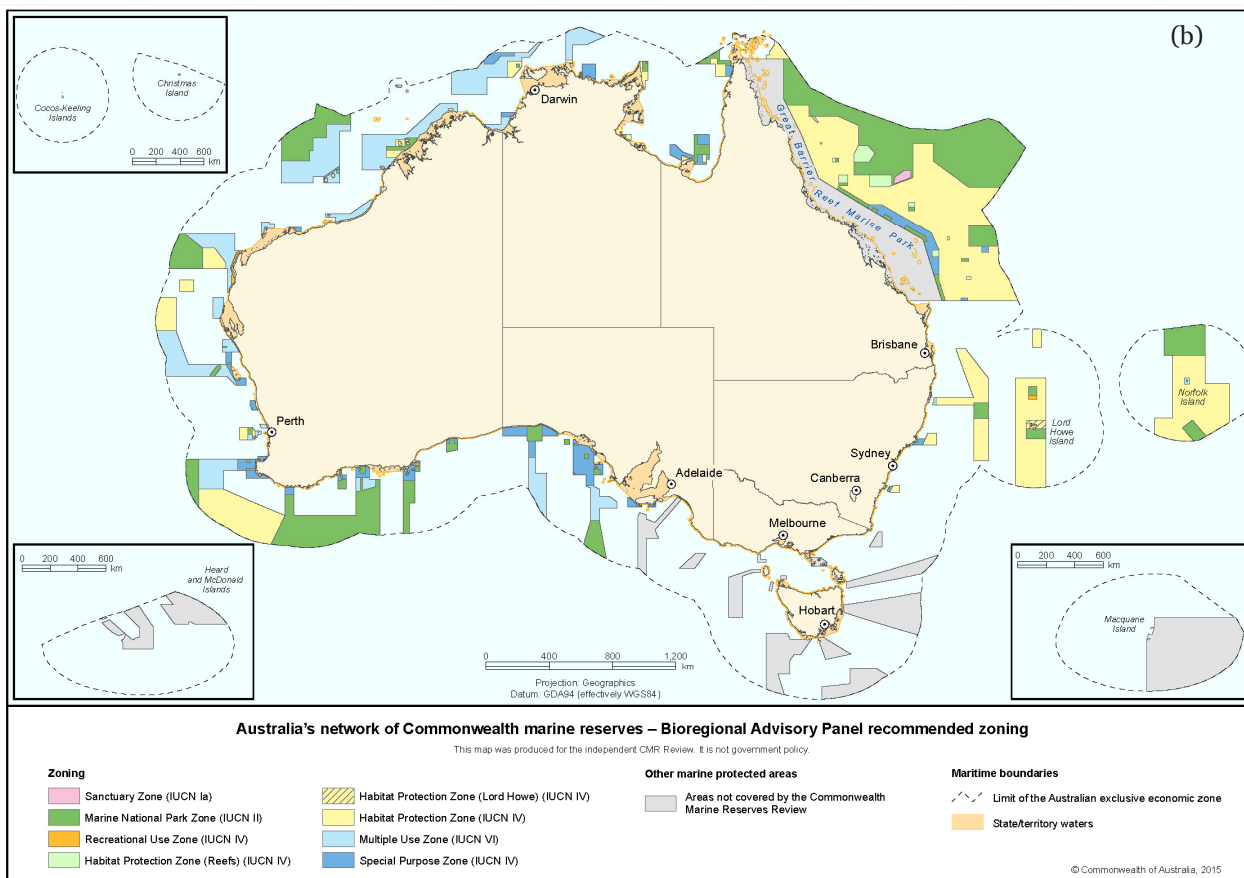


Table 1. Summary of proposed changes to zoning of Commonwealth Marine Reserves from 2012 declaration to release of draft management plans (adapted from Director of National Parks, 2017)

| Zone | At proclamation (2012) | Draft plans (July 2017) | Additional note |
|--|--|--|--|
| Green zones (high level of protection) | <ul style="list-style-type: none"> • 866,335 km² • 36% • 331 conservation features protected | <ul style="list-style-type: none"> • 465,327 km² • 20% • 331 conservation features protected | <ul style="list-style-type: none"> • Of 509 conservation features, such as canyons, seamounts and reefs, a total of 331 or 65% are protected under sanctuary or national park zones – the highest level of protection possible. • 63% of marine parks covered by green and yellow zones compared to 60% in 2012. • 63% of marine parks closed to oil and gas extraction, compared with 60% today. |
| Yellow zones (allows for sustainable use, so long as seafloor not harmed) | <ul style="list-style-type: none"> • 564,132 km² • 24% • 192 conservation features protected | <ul style="list-style-type: none"> • 1,017,877 km² • 43% • 265 conservation features protected | <ul style="list-style-type: none"> • Another 265 conservation features are protected under habitat protection zoning, protecting the seafloor. |
| Blue zones | <ul style="list-style-type: none"> • 944,253 km² • 40% | <ul style="list-style-type: none"> • 891,250 km² • 37% | <ul style="list-style-type: none"> • Allows for sustainable use. |

Parks') for the South-west, North-west, North, Coral Sea and Temperate East network. The draft management plans proposed to reduce the area of high level protection ('green zones') proposed in the 2012 proclamation from 36 per cent (and 33 per cent in the Review mentioned immediately above) to 20 per cent. The draft management plan zoning suggested that the same number (331) of conservation features were to be protected in green zones in the 2012 and draft management plans (Director of National Parks, 2017). While this seemed encouraging from a representation perspective, it is not clear how many conservation features were not represented. The nationally-agreed *Guidelines for Establishing the National Representative System of Marine Protected Areas* stated clearly "the NRSMPA will aim to include some highly protected areas (IUCN Categories I and II) in each bioregion" (ANZECC TFMPA, 1998). In the 2012 zoning, 17 of Australia's 85 bioregions had no high-protection MPAs, and a further 22 had 1 per cent or less in high-protection MPAs (Beaver, 2016). Further reductions in the area of high protection are likely to impact this representation, while the significant reduction in green zone area is likely to impact the adequacy of the network.

In making the proposed changes, the Director of National Parks (2017) considered comments from "over

54,000 submissions providing feedback on the preparation of draft plans", as well as "the recommendations from the independent review of Commonwealth marine reserves released in 2016; the best available science; the expertise of traditional owners on managing sea country; and experiences from those managing Australian and international marine parks". Furthermore, the Director of National Parks (2017) stated "Our more balanced approach means there is a significant increase in yellow zones – where the seafloor is protected, but activities like diving and fishing are allowed. Our green zones are based on the best available science – while minimising impacts on our important tourism and fishing industries". Despite this emphasis on 'best available science', no scientific analysis nor public consultation analysis was presented to justify the significant reduction in highly-protected zones (especially in the South-west and the Coral Sea) subsequent to the recommendations of the Independent Review process and the substantive process leading up to the 2012 declaration. WWF-Australia claimed "the Federal Government's proposed changes to marine parks would be the largest downgrading of protected area the world has ever seen" (WWF-Australia, 2017).

The management plans passed both houses of Parliament in early 2018 and came into effect on 1 July 2018 (see <https://parksaustralia.gov.au/marine/>).

CONCLUSIONS

Guided by a science-based approach in the past two decades, the Australian MPA estate has grown rapidly but has faced (and continues to face) a number of challenges, many of them political. Some of the lessons from the Australian experience presented here may be applicable to other nations and states as they seek to build their MPA networks to meet international targets for marine conservation (e.g. Convention of Biological Diversity, especially Aichi Target 11 (CBD, 2010)).

ENDNOTES

¹A Marine Protected Area Network can be defined as “a collection of individual MPAs or reserves operating cooperatively and synergistically, at various spatial scales, and with a range of protection levels that are designed to meet objectives that a single reserve cannot achieve” (IUCN-WCPA, 2008).

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ABOUT THE AUTHORS

James Fitzsimons is the Director of Conservation for The Nature Conservancy’s Australia Program where he oversees the organisation’s conservation planning, science, implementation and policy functions. He is an Adjunct Professor at the School of Life and Environmental Sciences, Deakin University, with particular research interests in the fields of protected area policy, practical conservation planning and mechanisms to integrate conservation outcomes on public and private lands. He has previously worked in the fields of conservation policy and planning for government environment departments and agencies, and for non-government environment organisations.

Geoff Wescott was Associate Professor of Environment (and is now an honorary Research Fellow) at Deakin University, Melbourne. He is also an

honorary Principal Fellow at the University of Melbourne. He is a previous Chair of the Marine and Coastal Community Network which he also represented on the National Oceans Advisory Group. He was a Deputy Chair of Parks Victoria, a member of the Victorian Coastal Council and has served on the steering committee of the past three Nature Conservation Reviews of the Victorian National Parks Association. He is the immediate past President of the Australian Coastal Society, a Director of Zoos Victoria and sits on the Victorian Environmental Assessment Council. He has just completed a review of Victoria’s marine and coastal legislation as the Chair of the Minister’s Expert Panel. He has published over 100 articles on marine and coastal matters including a popular field guide to rocky shores in south-eastern Australia.

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RESUMEN

Australia fue uno de los primeros países en declarar un área marina protegida (AMP) en 1879, pero no fue sino hasta las décadas de 1960 y 1970 que, con motivo de los esfuerzos emprendidos para proteger la Gran Barrera de Coral, la protección marina se consideró de forma concertada. El desarrollo más reciente de redes (o sistemas) de AMP por parte de los gobiernos en las aguas jurisdiccionales estatales, territoriales y nacionales (Commonwealth) ha situado a Australia nuevamente en el centro de atención mundial en el desarrollo de AMP. Recogimos las experiencias de representantes de AMP de organizaciones gubernamentales y no gubernamentales, de la industria y la academia (en forma de capítulos de libros escritos por encargo) para describir diversos aspectos de las AMP en Australia, desde la historia, los éxitos y los desafíos en la creación de redes jurisdiccionales, pasando por los aspectos científicos, económicos y legales de las redes australianas de AMP, hasta diferentes perspectivas sectoriales. Se examinan e incluyen temas clave como: 1) Las áreas marinas protegidas son siempre cuestionadas (al principio); 2) Declaración en relación con redes de AMP para todas las jurisdicciones frente a declaraciones de AMP individuales, con sus respectivas ventajas y desventajas; 3) Para los sistemas federales de gobierno, la coordinación entre jurisdicciones es importante; 4) Por ser las primeras AMP establecidas, las reservas pesqueras "enturbian las aguas" para los objetivos de las AMP modernas; 5) Un sinnúmero de categorías, zonas y usos también ha confundido el concepto de AMP; 6) Uso múltiple versus protección total: poniendo en evidencia los beneficios y la necesidad de objetivos claros para cada tipo; 7) Reconocer la brecha entre la ciencia pura y la realpolitik o pragmatismo político en el establecimiento de AMP; 8) La participación de las comunidades indígenas en las AMP ha sido más lenta que en las áreas protegidas terrestres, pero está mejorando. También se examinan los cambios recientes y sustanciales en la histórica declaración de 2012 del Gobierno australiano sobre una red de AMP en su zona económica exclusiva.

RÉSUMÉ

L'Australie a été l'un des premiers pays à installer une aire marine protégée (AMP) en 1879, mais ce n'est que dans les années 1960 et 1970, dans le cadre des efforts déployés pour protéger la Grande Barrière de Corail, que la protection marine a été envisagée de manière concertée. La création plus récente de réseaux d'AMP par des états, des territoires et des juridictions nationales (du Commonwealth) a de nouveau placé l'Australie au premier plan dans le développement des AMP. Nous avons rassemblé (sous forme d'écrits commandés pour un livre) les retours d'expérience de représentants des AMP, tels des universitaires, des industriels, des membres d'administrations ou d'ONG, afin de donner une présentation complète des AMP, en partant de leur histoire, pour retracer ensuite les succès et les difficultés rencontrées lors de la création de réseaux juridictionnels, puis aborder les aspects scientifiques, économiques et juridiques, à partir des différentes perspectives sectorielles. Les thèmes clés abordés comprennent : 1) Les aires marines protégées se trouvent toujours contestées (du moins au début), 2) Les avantages et les inconvénients de la mise en place d'un réseau d'AMP à l'échelle d'une juridiction, par rapport à une AMP unique, 3) L'importance de coordination entre les juridictions dans un système de gouvernement fédéral, 4) Les réserves de pêche constituant les premiers exemples d'AMP ont 'brouillé les pistes' pour les AMP modernes dans réalisation de leur objectifs, 5) Le concept d'AMP s'est trouvé dilué par une multitude de catégories, de zones et d'utilisations, 6) Entre la protection totale et la gestion des activités : démontrer les bénéfices des différentes intensités de protection et la nécessité d'objectifs clairs pour chaque cas, 7) La reconnaissance de l'écart entre la science pure et la realpolitik dans l'installation des AMP, 8) L'implication des communautés autochtones a été plus lente dans les AMP que dans les aires terrestres protégées, mais est en progrès. Nous examinons également les importants changements récents apportés par le gouvernement australien à son décret historique de 2012 concernant la création du réseau d'AMP dans sa zone économique exclusive.