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Factors that contribute to the establishment of marine protected areas in Western Australia

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1. INTRODUCTION

This thesis focuses on state government processes to establish Marine Protected Areas (MPAs) in five areas in Western Australia (WA) during the period 1998–2012. This chapter provides contextual information relevant to MPA establishment in WA. The structure of this thesis is outlined below.

- Chapter 1 provides background on MPAs in WA, including the history, legal frameworks, approaches to establishment and some broader worldwide context.
- Chapter 2 outlines the methodological approach for this research, including an analytical framework for the review of the five MPA case studies.
- Chapter 3 provides contextual information for each case study area, including location, ecological values and socio-economic settings, as well as an outline of the key steps of the planning and establishment processes.
- Chapters 4–6 are ‘theme’ chapters on which the case study review focused. These chapters provide a summary of the documentation reviewed for the five MPA processes, together with data sourced from stakeholder interviews where relevant.
- Chapter 7 provides an analysis of the three themes, incorporating the results of the stakeholder interviews to test and build upon the documentation review.
- Chapter 8 is a discussion chapter bringing together the results of the research, and in particular, considering cross-cutting issues and recommendations where relevant to improve MPA processes in the future.
- Chapter 9 is a concluding chapter summarising the key findings and recommendations for future MPA establishment programmes.

For this thesis, published references are listed in Chapter 10 and all unpublished documentation is referenced by way of endnotes, which are detailed in Appendix 3.

1.1. AUSTRALIAN CONTEXT

While human societies have allocated land resources into an intricate and detailed system of public and private land tenure and associated land use, in most cases there has been unrestricted freedom of access to the sea and limited systems of spatial allocation (Norse et al. 2003). Formal tenured reserves set aside specifically for the conservation of the marine biodiversity have a relatively brief history, with only 118 MPAs worldwide in 27 nations in 1970, but increasing to 430 MPAs in 69 nations by 1985 (Kelleher & Kenchington 1992). This trend has continued, with 1,300 MPAs established and thousands more in the planning stages by 2003 (Roberts et al. 2003a) and 5,880 by 2010 (Toropova et al. 2010).

The International Union for Conservation of Nature (IUCN) defines an MPA as:

A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values (IUCN 2013).

In this thesis the term MPA refers to one of three types of tenured reserves established under the *WA Conservation and Land Management Act 1984*. The legislative framework and the purpose and management of these reserve categories are explained further in Section 1.3.

The responsibility for Australia's marine waters is separated between the Federal, State and Territory governments in accordance with the *Offshore Constitutional Settlement* (Attorney-General's Department 1980). States and territories are responsible for the management of state waters, which extend three nautical miles from an established territorial baseline.¹ In practice, this can include waters up to 60 nautical miles from the shore in WA (Simpson & Bancroft 2001). The national government is responsible for waters from the state waters limit (i.e., three nautical miles from the territorial baseline) to the 200 nautical mile limit (or continental shelf edge if further).

In 1986 the Australian Committee for the IUCN released *Australia's Marine and Estuarine Areas—A Policy for Protection* to focus attention and encourage the development of a national system of MPAs, and outline possible legislative options

¹ The territorial baseline is generally the low water mark but is defined further offshore where there are islands and/or a complex coastline.

for MPAs. This highlighted that, with the exception of the *Great Barrier Reef Marine Park Act 1975*, there was limited legislation dedicated to the gazettal and management of MPAs for marine conservation, there were few MPAs and most restricted areas were established under fisheries legislation or attached to mainland national parks and nature reserves (Australian Committee for IUCN Resources 1986).

Since the 1980s there has been a progressive increase in national focus on marine conservation and the establishment of MPAs. These national strategies include the *National Strategy for Ecologically Sustainable Development* (Australian National Parks and Wildlife Service 1992) and the *National Strategy for the Conservation of Australia's Biological Diversity, Australia's Oceans Policy* (Australian Government 1998). The Strategic Plan of Action for the National Representative System of Marine Protected Areas provided the framework for development of a national system of MPAs for Australia in both State and Commonwealth waters (ANZECC 1999).

These strategies contribute to meeting the Australian government's international commitments to the conservation of marine biodiversity, maintenance of ecological processes and the sustainable use of marine resources in accordance with the *Intergovernmental Agreement on the Environment* (Australian Government 1992). They also contribute to Australia's international responsibilities and obligations including the *Convention on Biological Diversity*; the *Convention on Migratory Species* (the Bonn Convention); bilateral agreements for migratory birds with Japan (JAMBAⁱ) and China (CAMBAⁱⁱ) and the IUCN *World Commission on Protected Areas Programme* (ANZECC 1999).

In 1998 the Commonwealth Government released *Australia's Ocean Policy*, which included a policy commitment to regional marine planning and the establishment of MPAs in Commonwealth waters (Australian Government 1998). The *Environment Protection and Biodiversity Conservation Act 1999* provides the legal framework for the establishment of MPAs in Commonwealth waters. As at March 2013, 60 Commonwealth MPAs have been established, covering 3.1 million square km of ocean which are managed primarily for biodiversity conservation (Australian

ⁱ JAMBA: Japan Australia Migratory Bird Agreement.

ⁱⁱ CAMBA: China Australia Migratory Bird Agreement.

Government 2013). In some cases Commonwealth and State MPAs adjoin (e.g., Ningaloo Marine Park in WA).

The declaration of MPAs in state waters is the responsibility of the Australian States and the Northern Territory. The policy frameworks applied by the states vary from multiple-use models (e.g., WA) to networks of no-take marine sanctuaries (e.g., Victoria). While these approaches vary, they all contribute to the national representative system of MPAs.

1.2. THE AUSTRALIAN POLITICAL SYSTEM

The Commonwealth of Australia was formed in 1901 when six independent British colonies become states of a new nation. Australians elect parliamentarians to the Federal Parliament of Australia, which is a bicameral body incorporating elements of the constitutions created by the British Parliament at Westminster and often labelled 'the Westminster model'. Australia largely operates as a two-party system in which voting is compulsory.

Under the federal system, powers are divided between a central government and individual states. The Australian Government is often referred to as the 'Commonwealth Government' or the 'Federal Government' and passes laws that affect the whole country. Section 51 of the Constitution defines the areas where the Australian Government can make laws. Under the Constitution of Australia, the States retain their sovereign powers except where power has been assigned to the Federal Government in accordance with the Constitution, or referred to the government by the states by legislation. Territories, on the other hand, are given their autonomous powers by the Federal Government through legislation.

The Commonwealth may still have constitutional rights over State areas where the Australian government is a signatory to international treaties that apply to the area. An example of this was the decision by the Tasmanian government to dam the Franklin River and flood a substantial heritage wilderness area, which led to a challenge in the High Court by the Commonwealth, and a ruling that the Commonwealth had the power under the Constitution to bind the State to any international treaties. In this case the action was stopped because Australia was a signatory to the *Convention Concerning the Protection of the World Cultural and Natural Heritage* (The Constitutional Centre of WA 2013).

State governments have their own constitutions, as well as a structure of legislature, executive and judiciary. The third level of government is 'local government' which is created under State and Territory laws, and uses a number of titles including 'cities', 'shires', 'municipalities' and 'councils'.

The key area of governance for this research is the WA State Government. The WA Constitution is based on the Westminster model providing for the Parliament to make laws for the 'peace, order and good government' of the State (Government of WA 2013). Section 50 of the Constitution Act 1889 specifies that the legislative power of the State shall consist of the Queen, the Legislative Council and Legislative Assembly. The key roles of Parliament include:

- The provision of responsible government. This includes that all members of the government's ministry are Members of Parliament, with the Constitution requiring at least one minister to be a member of the Legislative Council. The ministry will only hold government if it can maintain the confidence or a majority in the Legislative Assembly (or 'Lower House').
- Passing ordinary laws (statutes). This involves debate, amendment, passage and sometimes rejection or repeal of legislation. In the form of a Bill, proposed laws may be introduced in either the Legislative Council (Upper House) or the Legislative Assembly (Lower House).
- Passing money laws granting the finance for services to the people and scrutiny of the government's administration and expenditure.
- Representation of the people by providing a forum for the public's interests and concerns to be presented and debated by their elected representative (Government of WA 2013).

In WA general elections are constitutionally required for both Houses of the Parliament at least once every four years. In the Legislative Assembly the people are represented in districts, and in the Legislative Council the people are represented in regions.

Key implications of the political system for establishment of State MPs include;

- The creation (and amendment or cancellation) of MPs requires the majority support of both Houses of Parliament. Where government holds a slim majority in

either House the passing of an order to create (or disallow) an MPA could be decided by the vote of just one or a few members.

- The representative nature of the political system means that when election polls are close a marginal district may be critical to a political party's hopes of winning government, and hence contentious local issues such as MPA establishment may take on a greater political significance close to elections.
- The Lower House comprises members elected from their local districts. The member's local community constituents may have strong views on MPA creation and may lobby their member. This influence may be more significant where polls are close and members are trying to maximise their chances of election.

1.3. MPA ESTABLISHMENT IN WA

In WA the *Fisheries Act 1905* provided the first legislative base for the management of the State's marine resources, providing the ability to control fishing activities for the purpose of sustainability.

In December 1971 the WA Environmental Protection Authority (EPA) appointed the Conservation Through Reserves Committee (CTRC) to review and update recommendations in respect of national parks and nature reserves as a strategy towards protecting and enhancing the quality of marine and terrestrial environments. The CTRC divided the State into 12 systems based on natural geographic boundaries and developed recommendations which were released for public comment (the 'Green Book' recommendations). The EPA developed recommendations for terrestrial and marine conservation reserves for the 12 'systems' and published four reports between 1975 and 1984 (known as the 'Red Book' recommendations) (Environmental Protection Authority 1987). While this had a strong terrestrial focus, it included recommendations for marine areas including the Ningaloo Reef and Shark Bay.

The *Conservation and Land Management Act 1984* (CALM Act) provided the first legislation to enable the creation and management of MPAs. The WA State Government subsequently (in 1986) appointed an independent marine scientific committee to develop recommendations for a state-wide representative system of MPAs. The Marine Parks and Reserves Selection Working Group (MPRSWG) divided the state waters into broad marine bioregions based on biogeographical criteria. Within these areas candidate MPAs were selected that the group believed

representative of the marine habitats and communities that were found in each bioregion, and applied expert knowledge of areas having high biodiversity, rare or special habitats or other ecological value, with some consideration of socio-economic criteria (MPRSWG 1994).

WA's first MPAs were established under the CALM Act in 1987 (the Marmion and Ningaloo Marine Parks), and by 1990 seven MPAs had been established. MPA selection during this period was largely based on the EPA 'Red Book' recommendations discussed above, and there was no agreed framework for the establishment of a representative network. Between 1990 and 1994 no MPAs were established and the State Government reviewed the MPA legislation and policy framework for the management and establishment of MPAs.

The recommendations of the MPRSWG (MPRSWG 1994) were released in 1994 along with the State Government's new MPA policy *New Horizons in Marine Management* (Department of Conservation and Land Management 1994). This policy committed to the establishment of a representative state-wide system of MPAs based on the recommendations of the MPRSWG. It also confirmed support for a multiple-use approach and to changes in statutory consultation and establishment processes. Legislative changes were implemented in 1997 through the Acts Amendment (Marine Reserves) Act to amend the CALM Act, *Fish Resources Management Act 1994* (FRM Act), and relevant parts of State mining and petroleum legislation to implement the new policy framework (Government of WA 1997).

Key changes included the establishment of a new statutory vesting authority, legislative provisions for compensation for commercial fishing, aquaculture and pearling interests, changes to establishment processes, concurrence provisions for the Ministers for Fisheries and Mines to the creation and re-zoning of MPAs, and the creation of a third MPA type (marine management area, MMA). These legislative changes were completed in 1997 and the government confirmed its policy commitments via publication of the policy; *New Horizons—The Way Ahead In Marine Conservation and Management* (Government of WA 1998).

A major thrust of this policy was the establishment of a state-wide representative system of MPAs based on the recommendations of the MPRSWG. The policy was based on a multiple-use model that allowed flexibility in terms of the type of MPA, and for marine parks and MMA zoning to implement relevant human use restrictions

(Government of WA 1998). In December 1997 the government announced its intention to consider four new MPAs, and allocated increased resources towards implementing the new legislative and policy framework. Planning processes began shortly thereafter; however, six years passed before the first MPA was created under the revised legislation (Jurien Bay Marine Park). This represented a 13 year hiatus (1990–2003) when no MPAs were created.

The period between 2003 and the 2005 state election was a controversial phase in MPA establishment with significant public debate on specific MPAs and future policy directions. Five new MPAs were created and the Ningaloo and Rowley Shoals marine parks were extended. The election platform for the incumbent government (returned in 2005) included major commitments on MPA marine conservation policy frameworks, legislation and implementation of a new marine planning framework for WA (Australian Labor Party 2005). Between 2005 and 2008 these government initiatives were commenced, with varying results and outcomes. Between 2005 and 2011 only one MPA was established (i.e., Walpole/Nornalup Inlets Marine Park in 2009). The key events in the history of MPA policy and establishment between 1984 and 2011 in WA are summarised in Appendix 1.

1.4. THE LEGISLATIVE FRAMEWORK IN WA

In WA MPAs are vested in the Marine Parks and Reserves Authority (i.e., the Marine Authority) with three potential MPA types; marine nature reserve, marine park and MMA. The purpose of the three reserve types in the CALM Act are summarised below.

- **Marine nature reserves** are created for conservation and scientific research, with no recreational or commercial fishing, aquaculture, pearling, petroleum drilling or production permitted. The reservation of a marine nature reserve shall be for:

- (a) *The conservation and restoration of the natural environment; and*
- (b) *The protection, care and study of indigenous flora and fauna; and*
- (c) *The preservation of any feature of archaeological, historic or scientific interest (CALM Act s13A [1]).*

- **Marine parks** are the most common MPA used in WA and are created for the purpose of: *‘allowing only that level of recreational and commercial activity which*

is consistent with the proper conservation and restoration of the natural environment, the protection of indigenous flora and fauna and the preservation of any feature of archaeological, historic or scientific interest' (CALM Act s13B[1]).

Four statutory management zones can be created in marine parks:

- *Sanctuary zones*: no-take areas managed solely for nature conservation and low-impact recreation and tourism.
- *Recreation zones*: provide for conservation and recreation activities, including recreational fishing.
- *Special purpose zones*: are flexible zones managed for a particular priority use or issue (ecological or social). Uses compatible with the priority use or seasonal events are allowed in these zones.
- *General use zones*: conservation of natural resources in general use zones is a priority, but activities such as sustainable commercial fishing, aquaculture, pearling and petroleum exploration and production are permissible provided they do not compromise the conservation values.
- **MMA**s are multiple-use MPAs providing a formal integrated management framework over areas that have high conservation value and intensive multiple uses. The reservation of a MMA shall be for the purpose of '*managing and protecting the marine environment so that it may be used for conservation, recreational, scientific and commercial purposes*' (CALM Act s13C[1]).

The type of management applied and the level of restriction on human activities varies between categories and between zones in marine parks and MMAs. Table 1 summarises the MPA categories and relates these to the IUCN Protected Area Management Categories.

Table 1 MPA reserves in WA and how management equates to IUCN categories

MPA Reserve	Legal Establishment	Equivalent IUCN Category ⁱ	
Marine Nature Reserve	Approval of both Houses of Parliament for creation and amendment	IA	
Marine Park	Approval of both Houses of Parliament for creation and amendment	Sanctuary Zone	IA
		Recreation Zone	IV
		Special Purpose Zone	IV or VI
		General Use Zone	VI
MMA	Approval of both Houses of Parliament for creation and amendment	VI	

1.5. APPROACHES TO MPA ESTABLISHMENT

The nature of marine systems and the historical jurisdictional and governance arrangements provide unique characteristics and challenges for marine conservation planning and management (Kenchington 2010). Carr et al. (2003) consider that traditional conservation reserve design theory has been developed primarily with terrestrial systems in mind, and these differences must be understood to ensure MPA systems meet the required objectives. These differences include ecological, genetic and evolutionary patterns and processes, the nature and scale of contemporary threatening processes and management approaches. The prevalence of an aquatic medium is critical to reserve selection and effective reserve design needs to be informed by larval dispersal (Gaines et al. 2003; Shanks et al. 2003).

The identification process and selection of potential MPAs can be driven by ecological criteria, or a combination of ecological and social, cultural and economic criteria (Leslie 2005). While theoretically ecological criteria should be the primary driver in selecting areas for biodiversity conservation, MPAs may be selected on the basis of little or no ecological information or driven primarily by socio-economic or political criteria (Vanderklift & Ward 2000; Roberts et al. 2003b). Some believe that designation of MPAs has been ad hoc, driven by opportunity rather than strategic and systematic approaches, and that a systematic approach is preferable and more

ⁱ Based on advice from Department of Parks and Wildlife July 2013.

defensible (Leslie et al. 2003). The creation of MPAs on an opportunistic basis is supported (Kelleher & Kenchington 1992; Roberts 2000); however, locating MPAs poorly, particularly where external human impacts cannot be effectively managed, may result in poor conservation outcomes and an opportunity cost in wasting scarce resources on establishment and management of an MPA that is unlikely to meet its conservation objectives (Agardy et al. 2011).

The use of ecological criteria in identifying and selecting MPAs has been discussed extensively in the literature, with the simplest way to select reserves based on representation of habitats in biogeographical regions (Roberts et al. 2001). A survey of 27 MPA cases around the world found that 11 were initially driven by ecological criteria, while the remaining 16 were driven using a combination of both ecological and socio-economic criteria, while no processes were driven primarily and solely by socio-economic criteria (Leslie 2005).

1.6. PUBLIC PARTICIPATION

The establishment of MPAs is a complex and often controversial process, given the varied community viewpoints and the potential for socio-economic impacts. Conservation interventions, such as implementing new MPAs, may have acquisition, management, transaction, damage and opportunity costs (Naidoo et al. 2006). MPA establishment can have positive economic effects, including job creation for harvest of renewable and non-renewable resources and use for non-consumptive purposes such as tourism and recreation (Dixon 1993), but also immediate and negative impacts on fishing communities (Charles & Wilson 2009). While positive impacts may result on fisheries (Pezzey et al. 2000; Russ et al. 2004) and industries such as tourism (Russ et al. 2004), short-term and localised economic impacts remain a major obstacle to the establishment of MPAs.

Imposition of MPAs without community consensus often leads to failure (Christie & White 2007), and given that social factors are often a primary determinant of success (Mascia 2003), stakeholder involvement is an essential ingredient (NOAA 2004). An empowered community can assist in balancing environmental and economic objectives, plus reduce resource conflicts and facilitate improved decision-making and management implementation (Pomeroy 1999; Pomeroy & Douvere 2008), and participation can increase the quality of government decision-making (Fox et al. 2013a).

The benefits of community support include increasing the level of understanding, building ownership and support, increased legitimacy of the MPA, reducing conflicts, utilising local knowledge, acknowledging rights and support for regulations and improved compliance once established (NOAA 2004).

‘Public participation’ in this thesis relates to the active involvement of the community in the development of MPA proposals prior to government statutory decisions (i.e., legal creation and implementation of management arrangements). Public participation approaches vary depending on the level of involvement and participation in decision-making by the public and stakeholders (English Nature 2001; Government of WA 2003). This continuum is summarised in Figure 1.

The complexity of establishing MPAs increases with the diversity of stakeholders (Lundquist & Granek 2005), and this can lead to difficulties, as experienced in the Channel Islands (Davis & Moretti 2005). Key factors in successful MPA processes include the establishment of trust and confidence of stakeholders, the establishment of effective partnerships and acknowledging and effectively managing stakeholder perceptions (English Nature 2001). The role of supporting education and information programmes is also a key feature of successful processes (English Nature 2001; Jones et al. 2001; Lundquist & Granek 2005).

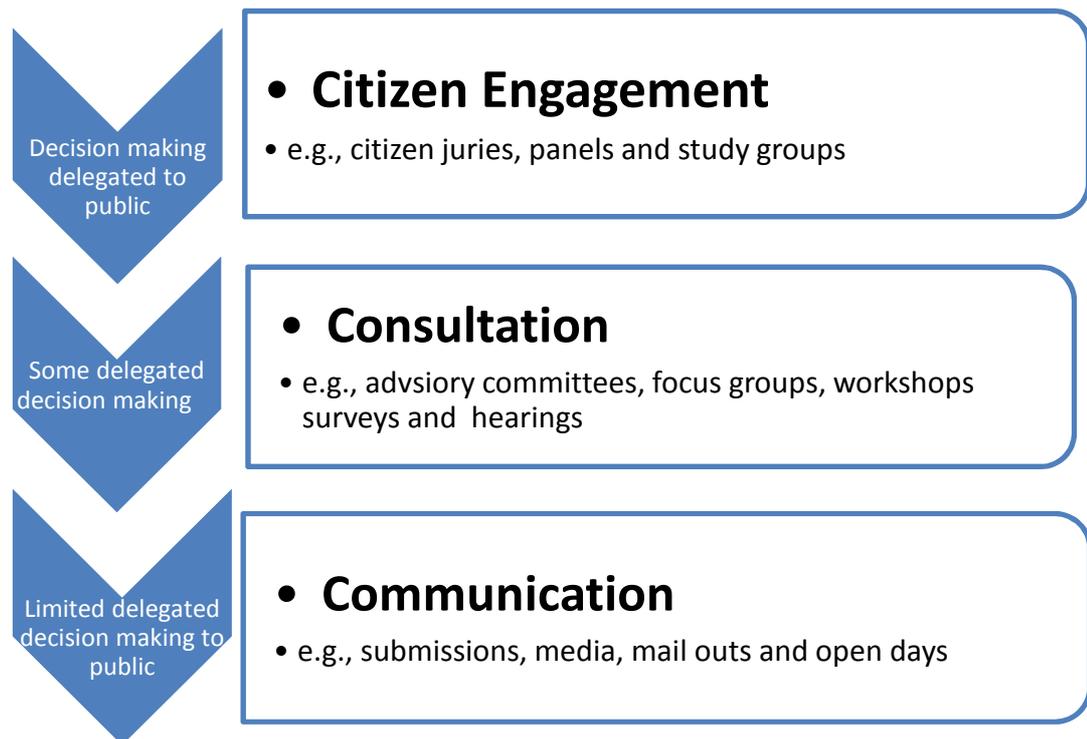


Figure 1 Levels of public involvement and influence in decision-making; from *Consulting Citizens: Planning for Success* (Government of WA 2003)

While public participation programmes can bring a range of benefits, these programmes can be expensive, resource intensive, lead to delays in establishment, create tensions between stakeholders and sometimes lead to a lack of consensus (NOAA 2004). Also, the resulting management outcomes may be ‘watered down’, whereby the MPA delivers a low level of protection for the marine environment (NOAA 2004).

Public participation processes are often categorised as ‘top-down’ approaches (i.e., driven by government) or ‘bottom-up’ approaches (i.e., driven from local users and perspectives), although there is a developing view that a combination of the two approaches is required; i.e., a government-driven process that is highly inclusive of local stakeholders (NOAA 2004). There are key challenges in integrating socio-economic, political and scientific factors in MPA processes (Davis & Moretti 2005; Lundquist & Granek 2005). Participation may also be categorised as ‘one-way’, where agencies inform the community of a course of action, or ‘two-way’, where the community is involved via advisory or citizen groups to collaboratively develop the proposed course of action (Sayce et al. 2013).

Generic approaches to MPA establishment may not be appropriate given the complexity of social, cultural, economic and environmental settings, history, perceptions and values, and the model and approach may need to be tailored to each circumstance (Kelleher 1999; Agardy et al. 2003; NOAA 2004; Lundquist & Granek 2005).

In WA the statutory public consultation requirements are detailed in the CALM Act. The statutory requirements centre on the release of a Notice of Intent (NOI) publishing the intent to establish an MPA. The NOI must include an Indicative Management Plan (IMP), which outlines how the proposed MPA will be managed. The NOI and IMP are publicised for a three-month period to enable public comment on the proposal.

The key statutory steps for establishment of an MPA in WA process are listed below¹.

1. Agreement is sought from the Ministers for Fisheries and Mines to publish a NOI to reserve.
2. The proposed IMP must be issued immediately prior to publication of the NOI.
3. Subject to agreement and availability of the proposed IMP, the NOI is published in the *Government Gazette* and newspapers, and on signs in the area if the Minister so directs.
4. The NOI must contain the proposed boundaries, reserve purpose, an indication with regard to making a proposed reserve Class A, where relevant map and proposed IMP can be inspected and obtained, how written submissions will be dealt with, proposed zoning (and in the case of a proposed marine park any intended declarations about compatibility of activities in recreation and special purpose zones) and other relevant information.
5. A copy of the proposed IMP must be submitted to the Ministers for Fisheries and Mines to provide them with the formal opportunity to make a submission.
6. The minimum period for response to the NOI is three months and each relevant local government must be notified and given a reasonable time to prepare a written submission.

7. The MPRA must provide a report to the Minister on the submissions received in response to the NOI to reserve.
8. The Minister must be satisfied that an IMP gives effect to, or takes into consideration, the submissions of the Ministers for Fisheries and Mines to the extent provided for in legislation.
9. Agreement to reserve must be sought from the Ministers for Fisheries and Mines.
10. If it is proposed that a marine park or MMA be made Class A when reservation is made, then the agreement of the Minister for Mines in this respect is also required.
11. Agreement to the intended management zoning scheme of a marine park or a MMA must be sought from the Ministers for Fisheries and Mines. The intended management zoning scheme would be described in the IMP.
12. After the Minister receives agreement to reservation from the Ministers for Fisheries and Mines, the Governor in Executive Council makes the order to reserve the candidate area and, where applicable, make it Class A.
13. The reservation order must be published in the *Government Gazette*.
14. Every reservation order must be tabled in each House of Parliament, where it may be subject to a motion of disallowance.
15. Subject to receipt of agreement (see Item 16), a Section 62 classified area notice made by the Minister effecting a management zoning scheme must be made as soon as practicable after reservation and published in the *Government Gazette*.
16. Once the reservation order is made the Minister may approve the final IMP and notice of approval must be published in the *Government Gazette*.
17. All marine nature reserves, marine parks and MMAs are automatically vested in the MPRA.

Aside from the publication of the NOI and IMP, the CALM Act does not detail any specific requirements for community consultation. However, the conservation agency has a policy to facilitate and promote public participation and community input into the establishment process, and during the period of this research used

community-based advisory committees as the central mechanism to facilitate this input. The role these committees played in the five case studies is discussed in detail in throughout this thesis. However, broadly, the advisory committees used had the following roles:

- To assist the conservation agency in the planning of the MPA.
- To provide advice on the proposed MPA type, boundaries and reserve class.
- To provide advice to ensure that the IMP included appropriate management strategies that will protect the ecological and social values and take account of community aspirations for the future management of the area.
- To provide community input into the development of an IMP through consultation with the community.

Advisory committee members were encouraged to take an ‘expansive view’ of issues rather than a narrow personal or sectoral view, with members chosen for their knowledge and expertise and general standing in the community. They were expected to take a considered position of the issues and actively promote balanced outcomes that were in the community’s long-term interest. The responsibilities of individual members included:

- Observing an Advisory Committee Code of Conduct.
- Seeking and considering the views of the broader community in advisory committee deliberations.
- Contributing in a positive manner to the development of management options.
- Ensuring they are fully informed of community opinion.
- Working collaboratively with other committee members towards consensus decisions on areas of conflict (MPRA 2000b).

1.7. LEVELS OF PROTECTION

MPAs are an important tool for marine conservation, but may not be successful in protecting ecosystems from human impacts within and outside the MPA. Broader consideration of cumulative impacts and the use of other marine management measures may be essential to ensure MPAs meet their overarching conservation objectives (Day 2008; Ban et al. 2010; Agardy et al. 2011). There has been a

progressive move to ecosystem approaches to address the need for more integrated marine management and consideration of cumulative impacts. Marine Spatial Planning (MSP) has been promoted as a means to achieve more effective marine management and provide a framework in which MPAs are a key part (Douvere 2008; Gilliland & Laffoley 2008; Agardy et al. 2011).

The application of MPAs varies within and across countries, with a complex range of scales, intensity of management and degree of protection. There is general acceptance of the need for comprehensive and representative MPAs for the protection of biodiversity and there is support for fully protected areas as a component of a balanced marine conservation strategy (Scientific Consensus Statement on Marine Reserves and Marine Protected Areas 1997; The Townsville Declaration on Coral Reef Research and Management 2002).

The most debated aspect in implementing MPA systems is the proportion of the environment that needs to be fully protected from extractive activities (i.e., no-take areas) to achieve biodiversity objectives. The proportion (or size) of an ecological unit or MPA that needs to be fully protected from extractive activities to achieve the MPA's objectives is strongly debated, with the critical area of debate in respect to 'adequacy' (Lubchenco et al. 2003).

The principle of adequacy relates to whether the MPAs will be effective in the conservation of biodiversity; i.e., ensuring the viability and integrity of marine populations, species and communities (ANZECC 1999). 'Adequacy' is complex and difficult to define, as it is affected by a range of variables with no accurate data for determining criteria for adequacy (ANZECC 1999). These variables include the size and distribution of MPAs, the degree of protection, extent of degradation and modification outside of the MPAs, as well as ecological differences in species and marine communities. Another key factor is the fluid nature of marine ecosystems, as protection of species cannot usually be linked to one site. Species may have large ranges and genetic material can be carried by water currents over hundreds of kilometres (Kelleher & Kenchington 1992).

There are a range of views within the scientific community of the relative benefits of full protection and the proportion required to achieve conservation objectives. While 100 per cent protection would be ideal in an ecological sense, this is not usually socially or politically acceptable. Ballantine (1997) has stated that 10 per cent is a

minimum, but that 20–30 per cent would optimise benefits, with Roberts et al. (2001) suggesting that no-take MPAs should cover between 20–50 per cent of habitats. Other recommendations have been 30–50 per cent for the Channel Islands, as recommended by a scientific panel (Airamè et al. 2003), while the *Townsville Declaration* called for 30–50 per cent of the available reef to be set aside as no-take (The Townsville Declaration on Coral Reef Research and Management 2002). Boersma et al. (1999) suggest that MPAs can only be effective if they are representative, networked within biogeographical zones and the area per zone is greater than 20 per cent.

In reality, a ‘one size fits all’ approach is unlikely to be relevant, given that the level of protection will depend on a wide range of variables, such as the size of the area, variability of habitat, anthropogenic pressures, stability of the environment and the uniqueness of the biodiversity, among other factors.

In terms of recent Australian examples, the Great Barrier Reef Marine Park (GBRMP) and the Ningaloo Marine Park are both large ‘mature’ multiple-use MPAs that cover complete bioregions with 33 per cent and 34 per cent zoned as no-take zones, respectively. This could be considered adequate protection by governments and provides a potential benchmark. The systematic re-zoning of the GBRMP was based on a bioregionalisation process and driven by 11 biophysical and four operational principles, including that a minimum 20 per cent of each bioregion was represented in highly protected zones (Kenchington & Day 2011).

Some practitioners caution against governments adopting rigid targets for no-take areas, as this can lead to conflict and create an ideological divide between scientists, resource managers and policymakers, leading to derailment of MPA creation processes and abandoning of these projects (Agardy et al. 2003). In the context of MPA establishment, the concept of adequacy is a highly relevant issue and is a significant area of stakeholder disagreement in MPA establishment.

1.8. CASE STUDY RESEARCH

There are many reviews of MPA public participation approaches outside of Australia, including individual establishment processes and reviews of multiple MPA establishment processes within a country and multiple MPA reviews across multiple countries. Examples include 12 UK processes (English Nature 2001), 15 European

case studies (Jones et al. 2001), Thailand (Lunn & Dearden 2006), Alaska (Springer 2006) and the Channel Islands in California (Airamè et al. 2003; Davis & Moretti 2005). Broad-based reviews of multiple MPA establishment processes in a specific country include the establishment of a MPA network in the Red Sea (Gladstone et al. 2003), the United States (Kessler 2003; Bernstein et al. 2004), the Philippines (Pollnac et al. 2001; Beger et al. 2004), the South China Sea (Pitcher et al. 2000); Chile (Fernandez & Castilla 2005) and Canada (Nicholls 1998; Guenette & Alder 2007). Considerable literature focuses on the Californian MLPA Initiative, for example, Sayce et al. (2013).

Research to investigate generic factors and lessons learned include a review and lessons learned from MPA establishment processes in the Philippines, Chile and Brazil (World Bank 2006); a review and lessons learned from case studies in Canada, the United States and Australia (Living Oceans Society and World Wildlife Fund 2005); a review of MPA experiences in Thailand, Philippines, Indonesia, Australia (GBRMP), New Zealand, the United States, Mexico, Belize and the Netherland Antilles (Ticco 1996); a synthesis of information on 27 marine planning cases across the world (Leslie, 2005); a review of characteristics and approaches to MPA establishment and evaluation of stakeholder participation in UK marine sites (Jones et al. 2001); a listing of 25 short case studies from around the world (Salm et al. 2000) and a comparison of the GBRMP and two United States MPAs (Osmond et al. 2010).

Australian MPA case study research on establishment and planning has focused largely on the GBRMP, with reviews and summaries of zoning, adaptive management and lessons learned (Day 2002, 2008; Fernandes et al. 2005; Douvere 2008; Kenchington & Day 2011).

There has been limited research on the legal, planning and political processes associated with the creation of WA's MPAs. Marshall and Moore (2000) considered the role of science, politics and the community in developing management plans for the Shark Bay Marine Park and the adequacy of conservation outcomes. Ingram (2008) explored the local community's perceptions of natural area planning on the Ningaloo Coast and the Ningaloo Marine Park planning process, and research has been undertaken on tourism values of the Ningaloo Marine Park (Wood & Glasson 2005). A study of socio-economic impacts was also undertaken for sanctuary zone

changes in the Ningaloo Marine Park (Northcote & Macbeth 2008). There has been no systematic review of MPA processes in WA which follow the process from inception to establishment, and no research to investigate the factors for the success or failure of MPA establishment using a case study approach.