



Developing a Representative System of Marine Protected Areas in NSW — an Overview

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New South Wales

Developing a Representative System of Marine Protected Areas in NSW — an Overview

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Foreword

In recognition of the important contribution of the coast and our oceans to our Australian way of life, the New South Wales Government is developing a representative system of marine protected areas to conserve the marine biodiversity of NSW.

These marine protected areas aim to conserve marine and estuarine ecosystems, rare and threatened species and communities, and other areas of high conservation value. They also provide for ecologically sustainable use of marine resources and opportunities for public appreciation, understanding and enjoyment.

In addition to conserving marine biodiversity, marine protected areas are important socially, economically and culturally as they contribute to regional communities by creating jobs and services important for tourism and recreation. Marine protected areas also play an important role in sustaining commercially or locally important resources upon which our coastal communities depend.

The NSW Government is systematically assessing the marine bioregions in NSW to identify potential sites for declaration as marine protected areas. An assessment of the NSW portion of the Tweed-Moreton Bioregion has been completed. Assessments of the Manning Shelf, the Batemans Shelf and the Twofold Shelf Bioregions are underway. The Hawkesbury Shelf Bioregional Assessment is due to commence shortly.

It is envisaged that individual marine protected areas will meet a variety of conservation objectives and range in size and design from small, special-use areas to large multiple-use areas.

The community will be encouraged to participate in the selection and management of new areas and will continue to be consulted in the management of existing marine protected areas.

Our commitment is a significant step towards the establishment of a world-class, representative system of marine protected areas in NSW and will provide a lasting legacy for future generations of Australians. This document provides a guide to policy principles and area selection processes.



Eddie Obeid
Minister for Fisheries



Bob Debus
Minister for the Environment

November, 2001.

Executive Summary

NSW is committed, under international and national conventions and strategies, to the conservation of marine biodiversity and the ecologically sustainable use of marine resources. Accordingly, a national representative system of marine protected areas is being developed by Commonwealth, State and Northern Territory government agencies for the conservation and sustainable use of the marine environment. As part of this collaboration, the NSW Government is developing a representative system of marine protected areas for NSW waters.

The Interim Marine and Coastal Regionalisation for Australia (IMCRA) report has provided the general planning framework for developing the NSW Representative System of Marine Protected Areas.

Marine protected areas are coastal, estuarine or oceanic areas that are managed to conserve marine biodiversity. They range from small, highly protected areas that focus on species or community protection to large multiple-use areas that include complex linkages of ecosystems and habitats.

Marine protected areas are not the only means to conserve marine biodiversity in NSW. Other mechanisms that can complement the NSW marine protected area system include fishery management plans, fishing closures, estuary and catchment management plans, conservation agreements, threatened species recovery plans, threat abatement plans, and habitat protection plans.

An integrated system of marine protected areas will aim to contribute to, and take advantage of, all these measures to manage processes that may affect marine biodiversity. Each bioregion will, in most instances, be represented by at least one large marine park, declared under the *Marine Parks Act*. It will be representative of the ecosystems and habitats found in the bioregion.

Aims

The primary goal of the NSW Representative System of Marine Protected Areas is to establish a comprehensive, adequate and representative system of marine protected areas that includes a full range of marine biodiversity at ecosystem, habitat, and species levels.

The NSW Government has adopted the Australian and New Zealand Environment and Conservation Council's (ANZECC) 'Guidelines for Establishing the National Representative System of Marine Protected Areas', and the IMCRA bioregions (IMCRA Technical Group, 1998) as the basis for establishing and managing the NSW Representative System of Marine Protected Areas.

Implementation

An integrated system will be developed, using marine parks, aquatic reserves, national parks and nature reserves to achieve the optimum conservation of biodiversity and habitat protection.

The progressive development of the NSW Representative System of Marine Protected Areas will be achieved through two processes:

- Bioregional assessments, that use scientific and ecological criteria to describe the conservation values of the bioregion and to identify possible marine protected sites that will achieve comprehensive representation of biodiversity at regional and ecosystem levels.
- Site assessments, that describe site-specific conservation values in relation to habitats and species at smaller spatial scales.

The Marine Parks Authority, in consultation with NSW Fisheries and the NSW National Parks and Wildlife Service, will coordinate bioregional assessments, based on biological and biophysical information. The sequence of bioregional assessments will enable NSW to have all bioregions assessed by the year 2003.

The next step, site selection, allows individuals and communities to participate and contribute social and economic information on the effects of the areas on coastal communities and other stakeholders.

The marine environment of NSW is economically very important, particularly at the regional level, and opportunities for resource users need to be provided and appropriately managed. This access, however, should be considered in the context of the cumulative impact of all users on conservation values. The NSW Representative System of Marine Protected Areas will provide for harvesting of biological resources, provided biodiversity and cultural values are conserved.

The type, location and size of the marine protected area will largely be guided by the nature of protection required (purpose) to effectively conserve the species, communities, habitats, or ecological processes for which the site was identified.

Zoning is used within marine parks to identify conservation and management priorities, and operational plans detail the way the Marine Parks Authority manages each marine park and implements zoning. Four generic zones will be used in NSW Marine Parks – sanctuary zones, habitat protection zones, general use zones and special purpose zones.

Other marine conservation areas

Aquatic reserves are relatively small areas declared for the conservation of biodiversity and complement other marine protected areas.

Aquatic reserves are declared under the *Fisheries Management Act 1994*. The primary objective of aquatic reserves is to conserve biodiversity of fish and marine vegetation. Secondary objectives may include the protection of fish habitat, species management, protecting threatened species, populations and ecological communities or facilitating educational activities and scientific research.

National parks and nature reserves are established under the *National Parks and Wildlife Act*. All land (including submerged land) and all native plants and animals (except fish) are protected within parks and reserves. Coastal parks and reserves often incorporate the beds of adjoining lakes and estuaries, and may include marine extensions to low water and beyond.

Liaison and cooperation between the agencies responsible for marine protected areas will be essential to achieve the goals of the NSW Representative System of Marine Protected Areas. There are many opportunities for the different, and complementary, characteristics of the agencies and their legislation to achieve better outcomes than can be achieved by any one agency.

Management

The planning process for managing marine protected areas will be sufficiently flexible to suit local needs and conditions.

Management plans may be developed for a marine protected area. Such plans will detail the management of the area over a given period, generally five years, and provide a framework for the development of work programs that meet the objectives of the area. They will include procedures that link management, research and compliance. Management plans are also important in developing community understanding about management intent.

Permits can be used to manage activities that have the potential to impact on marine life and human use of the park. The regulation of allowable activities within marine protected areas may require permits or licenses.

Building community commitment

Opportunities for community participation, input into management and education on the benefits of marine protected areas should generate a sense of stewardship in the local community that will contribute to the success of the marine protected area.

To ensure effective management of marine protected areas, people who use them must be aware of and understand the values of the areas and comply with the management controls that protect those values. Therefore, there is a need for a widespread education strategy that highlights the impact of human activity on the marine environment, the role of marine protected areas and the reason for management plans and special management arrangements.

Ongoing community and stakeholder participation in marine protected area management is enhanced through advisory bodies representing key stakeholder groups and the community. These committees may advise relevant Ministers and marine protected area agencies on, among other things:

- proposals for marine protected areas
- conservation of marine biodiversity and ecologically sustainable use within marine protected areas
- matters relating to the application of marine protected areas legislation
- planning and management of marine protected areas.

Evaluation

Evaluating the effectiveness of marine protected areas in conserving marine biodiversity is recognised by the NSW Government as a priority in establishing and managing the NSW Representative System of Marine Protected Areas.

Research and monitoring outputs will be tailored to link closely with marine protected area management. All research will adhere to the ASTEC guidelines for the ethical conduct of research in protected and environmentally sensitive areas.

The overall ecological effectiveness of the NSW Representative System of Marine Protected Areas will depend largely on the design of the marine protected area system and the management of each area. Accordingly, detailed performance criteria will be developed to evaluate the effectiveness of individual areas in achieving their respective biodiversity conservation objectives.

This overview provides a context for the declaration of marine protected areas created under the *Marine Parks Act 1997*, the *Fisheries Management Act 1994*, and the *National Parks and Wildlife Act 1974*.

1 Introduction

The New South Wales marine environment contains a wide diversity of ecosystems, habitats and species along its coastline that stretches over 1,000 kilometres. Between its latitudes of 28° 15' S and 37° 30' S, subtropical waters flow south from the Coral Sea, mixing with warm temperate waters that extend to the far south where cool temperate conditions dominate. Over time, the prevailing environmental conditions have created unique coastal and offshore seascapes, resulting in a rich natural and cultural resource that is enjoyed by millions of people.

Human activities, however, have the potential to degrade marine environments and threaten the survival of marine species. In comparison with the rest of Australia, the NSW coast is highly developed with many threats and pressures on the marine environment. Large parts of the coastline and most estuaries have already suffered through *ad hoc* planning and development. Only a small number of lagoons, catchments and estuaries remain relatively pristine and loss of marine habitat is still occurring.

NSW is committed, under international and national conventions and strategies, to conserve marine biodiversity and to the ecologically sustainable use of marine resources. National strategies include the Intergovernment Agreement on the Environment, the National Biodiversity Strategy, and the National Ecologically Sustainable Development Strategy (see Appendix 1 for an overview of policies and strategies). At the State level, the NSW Government has developed complementary strategies, including the NSW Biodiversity Strategy and the NSW Coastal Policy. A key component of all these strategies is to establish a **comprehensive, adequate and representative system of marine protected areas**.

A national representative system of marine protected areas is being developed by Commonwealth, State and Northern Territory government agencies for the conservation and sustainable use of the marine environment. A strategic plan of action has been developed under direction of the Australian and New Zealand Environment and Conservation Council.

As part of this collaboration, the NSW Government is developing a representative system of marine protected areas for NSW waters. The Interim Marine and Coastal Regionalisation for Australia report provides the general planning framework for developing the NSW Representative System of Marine Protected Areas (Chapter 3). This report identified six discrete regions in NSW, made up of five coastal bioregions and one marine province: the Tweed-Moreton, Manning Shelf, Hawkesbury Shelf, Batemans Shelf, Twofold Shelf bioregions; and the Lord Howe province (Figure 2).

Marine protected areas are coastal, estuarine or oceanic areas managed to conserve biodiversity. They range from small,

highly protected areas that focus on species or community protection, to large multiple use areas that include complex linkages of ecosystems and habitats. Marine protected areas may include reefs, seagrass beds, rocky platforms, mangroves, estuarine waters, mudflats, salt marshes, shipwrecks, archaeological sites, and coastal and offshore areas of airspace, seabed and water. Internationally, marine protected areas are considered an important tool for achieving conservation objectives in the marine environment.

Marine protected areas are not the only means by which marine biodiversity is conserved in NSW (Appendix 2). Others include fishery management plans, fishing closures, estuary and catchment management plans, conservation agreements, threatened species recovery plans, threat abatement plans, and habitat protection plans. An integrated system of marine protected areas will aim to contribute to, and take advantage of, all these measures to manage processes that may affect biodiversity within marine or estuarine environments. The NSW Biodiversity Strategy¹, when finalised, will detail how these protective measures work together to achieve on-going conservation of our marine biodiversity.

The NSW Government is adopting a systematic approach to identifying marine protected area sites and for prioritising new areas for marine biodiversity conservation in NSW waters. It may take some time for all the marine protected areas identified in the bioregional assessments to be created as it will not be possible to resolve all potential conflicts immediately. When gaps in the representation of biodiversity are identified, they will be addressed through the selection of additional marine protected areas to achieve a comprehensive, adequate and representative system.

The representative system of marine protected areas will have many benefits for coastal communities, including tourism and regional and national economies. The NSW Representative System of Marine Protected Areas will include marine parks, aquatic reserves, national parks and nature reserves.

This overview provides a context for the declaration of marine protected areas created under the *Marine Parks Act 1997*, the *Fisheries Management Act 1994*, and the *National Parks and Wildlife Act 1974*.

1. NSW Government is amending the existing terrestrially-based NSW Biodiversity Strategy to include fish and marine components, forming a single biodiversity strategy for NSW.

2 Goals and Principles for Establishing a NSW Representative System of Marine Protected Areas

National guidelines (ANZECC, 1998) have been prepared to assist agencies in establishing the national representative system of marine protected areas. These guidelines recognise that individual States and Territories have existing processes that can be used to collectively develop a national system of marine protected areas. NSW has adopted the guidelines and used the goals and principles of the national representative system as a basis for developing the NSW Representative System of Marine Protected Areas.

The Primary and Secondary goals of the NSW Representative System of Marine Protected Areas:

To establish a comprehensive, adequate and representative system of marine protected areas that includes a full range of marine biodiversity at ecosystem, habitat, and species levels.

Secondary goals are to:

- protect areas of high conservation value
- protect important habitat, threatened ecological communities and rare and threatened species
- provide for ecologically sustainable use of marine resources within the NSW Representative System of Marine Protected Areas through management of human activities including recreation, tourism and fishing
- provide opportunities for public appreciation, understanding and enjoyment, including recreational and cultural needs of Indigenous users
- provide for education and scientific research.

2.1 PRINCIPLES FOR ESTABLISHING A NSW REPRESENTATIVE SYSTEM OF MARINE PROTECTED AREAS

The framework for identifying and establishing a representative system of marine protected areas in NSW is based on World Conservation Union (IUCN) and national guidelines.

1. The NSW Representative System of Marine Protected Areas will contain a comprehensive, adequate and representative sample of marine biodiversity, including a full range of ecosystems within and across all six bioregions (Figure 2).
- **Comprehensiveness:** is the degree to which the areas encompasses the full range of NSW marine biological/biophysical diversity and includes a full range of habitats within and across all six bioregions. Under recently published ANZECC guidelines, comprehensiveness applies at bioregion, ecosystem and habitat levels. To be comprehensive, the full range of ecosystems across the marine environment needs to be represented in the marine protected area system (ANZECC Taskforce on Marine Protected Areas, 1999).
 - **Adequacy:** is the capability of the areas to maintain biodiversity and ecological patterns and processes and other values, given both natural and human-induced disturbances. The areas will have the required level of reservation to ensure the ecological viability and integrity of species and com-

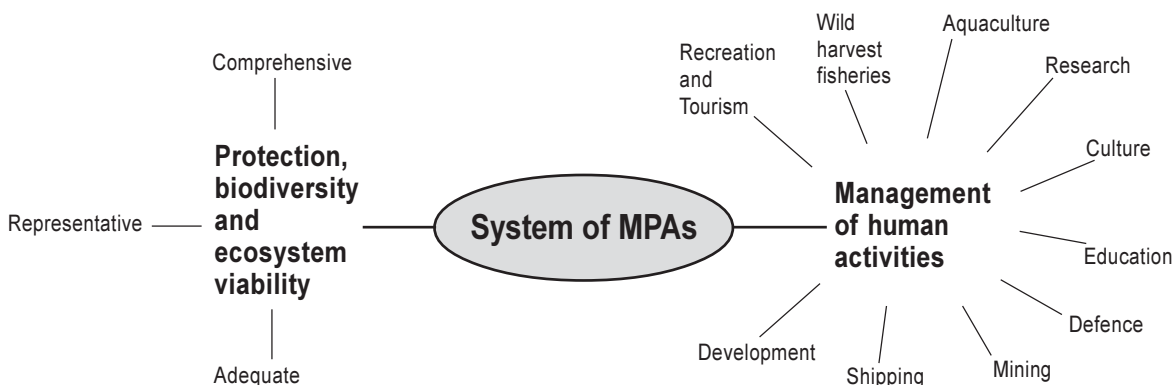


Figure 1: The Primary and Secondary goals of the NSW Representative System of Marine Protected Areas.

munities. The adequacy of the areas will depend on the level of management (within and outside the areas), the size and shape of marine protected areas, potential threats (within and outside the areas) and replication. (ANZECC Taskforce on Marine Protected Areas, 1999).

- **Representativeness:** is the extent to which the areas selected for inclusion in the areas sample known biological/biophysical diversity and other values. Marine and estuarine areas that are selected will reflect the diversity of the marine ecosystems from which they are derived. Representativeness applies to finer scales than comprehensiveness by including communities and species. To be fully representative, marine protected areas need to be typical of their biodiversity, but should also take into account rare and vulnerable species (ANZECC Taskforce on Marine Protected Areas, 1999).

2. In creating marine protected areas, the NSW Government will consider the social and economic effects of any proposals on coastal communities and other stakeholders. Any decisions to declare new marine protected areas will balance the costs and benefits of declaration and share any impacts equitably along the coast.

3. The bioregions used in developing the marine protected area system were defined under the Interim Marine and Coastal Regionalisation for Australia. Ecosystems, habitats and species will be used as the basis for ensuring representativeness within bioregions. An integrated system using marine parks, aquatic reserves, national parks and nature reserves will be developed to achieve the optimum conservation of biodiversity and habitat protection. Each bioregion will have its ecosystems and habitats represented within the marine protected area system.

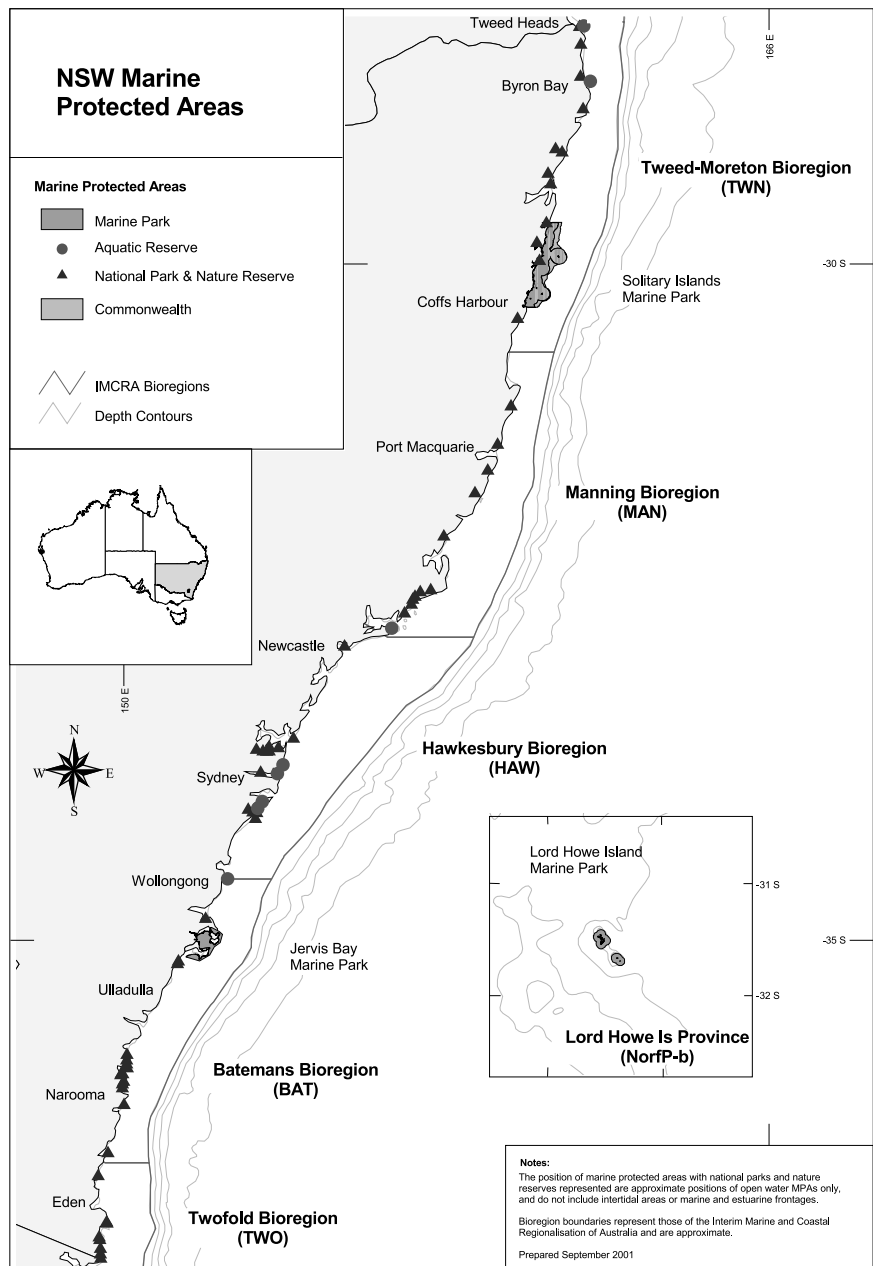
4. The selection process for marine protected areas will include consultation with the community and stakeholder groups, in-

cluding Aboriginal people. The selection process will also include consultation with the Commonwealth and other relevant jurisdictions, when appropriate.

5. Management of marine protected areas will involve strategic research to monitor over time the effectiveness of management actions.

6. A precautionary approach will be adopted in marine protected area management, consistent with the NSW principles for ecologically sustainable development and use. The absence of scientific certainty will not be used as a reason for postponing measures to establish or manage marine protected areas. If an activity is assessed as posing a risk of causing serious or irreversible impacts, or if there is insufficient information with which to assess fully and with certainty the magnitude and nature of impacts, decision making will be conservative and cautious.

Figure 2: NSW Marine Protected Areas



3 Marine Protected Areas

3.1 WHAT ARE MARINE PROTECTED AREAS?

The NSW Government has adopted the IUCN – World Conservation Union 1994 definition for protected areas:

“An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.”

The IUCN definition for protected areas is used as the international standard for determining which lands are part of the world’s nature conservation system, regardless of formal names or categories. The criteria do not require that protected areas be reserves, such as national parks, but do require that their explicit purpose is nature conservation and they are managed effectively.

The IUCN definition applies to areas managed principally for biodiversity conservation. Associated cultural and other values are also covered in the definition. Within the NSW marine environment, marine parks, aquatic reserves, national parks and nature reserves are accepted as meeting the IUCN criteria and constitute marine protected areas.

To provide a better understanding of the types of protected areas throughout the world, the IUCN has developed six management categories. The categories are not hierarchical as all categories contribute to biodiversity conservation (Appendix 3). The categories range from strict nature reserves to areas that allow managed sustainable use of natural resources and are applied to individual marine protected areas.

In NSW, marine protected areas have the following attributes:

- established especially for conserving biodiversity and marine habitats
- protect important habitat for fisheries management
- allow ecologically sustainable uses
- can be classified as one of the IUCN Protected Area Management categories
- have secure status which can only be revoked by a Parliamentary process
- contribute to the representativeness, comprehensiveness or adequacy of the NSW Representative System of Marine Protected Areas
- adequately maintain the values they are created to protect
- have a sound basis for declaration and management
- are effectively managed
- can be identified accurately on maps.

3.2 THE BENEFITS OF MARINE PROTECTED AREAS

For more than a century, reserves and other protected areas have been the cornerstone of attempts to protect outstanding natural landscapes, plants and animals and to ensure public access to and enjoyment of these areas. More recently, these areas are conserving biological diversity, especially through maintaining habitat and ecological processes.

Many of the first marine protected areas were marine extensions of terrestrial protected areas with no particular attention to the management of the marine components. In the late 1970s, scientists, resource managers and the general public became more aware of the vulnerability of the marine environment and its invaluable resources. This followed the declaration of the Great Barrier Reef Marine Park and international conferences and legal conventions that highlighted and supported the need for management and protection of the marine environment. There are now over 1,000 marine protected areas scattered across the planet, but these still cover less than 1 per cent of marine and estuarine waters.

Today, governments and marine management agencies are acknowledging the need and the many potential benefits of marine protected areas in the worldwide conservation of marine ecosystems. With increasing pressure on the marine environment, loss of habitats and declining fish stocks, the primary focus of marine protected areas is to conserve marine biological diversity. Objectives include:

- protecting unique and critical habitats and ecosystems
- conserving representative biodiversity, through representation of habitats or other appropriate surrogates
- protecting areas of high conservation value, including those containing high species diversity and centres of endemism
- protecting biologically productive areas
- protecting areas for the special needs of rare, threatened or depleted species, populations and communities
- protecting Aboriginal and geological sites
- conserving special groups of organisms such as migratory birds and whales
- conserving fish stocks for fisheries management purposes.

Research has shown that marine protected areas can have positive effects on the ecosystems and species under protection and may also have other benefits including:

- improved fisheries stocks through the protection of habitats critical for commercially and recreationally important species

- dispersal of larval recruits and genetic diversity to surrounding areas
- sites for education
- increasing community awareness and understanding
- provision of scientific reference sites for research and long-term monitoring.

Significant economic benefits can also result from marine protected areas, including the creation of employment opportunities through the sustainable harvest of resources, and the business generated from recreation and tourism activities.

Because any benefits depend on the design of the marine protected area, its management objectives and the species and communities involved, not all marine protected areas will show all these benefits, however.

3.3 TYPES OF MARINE PROTECTED AREAS

Marine Parks

Legislative Provisions:

The *Marine Parks Act 1997* has the following objectives:

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

The Act is administered by the Marine Parks Authority, which comprises the Director General of the Premiers Department, the Director General of the National Parks and Wildlife Service and the Director of Fisheries. In concert with NSW Fisheries and the NSW National Parks and Wildlife Service, the Authority seconded officers to manage and plan marine parks (see Appendix 4 for legislative and administrative requirements).

The Role of Marine Parks:

Marine Parks aim to conserve biodiversity by protecting representative samples of the habitats in each of the state's bioregions. Zoning is used to identify conservation and management priorities. Four generic zones (Section 5.2) will be used in marine parks – sanctuary zones, habitat protection zones, general use zones and special purpose zones. Operational plans detail how the Marine Parks Authority manages each marine park and implements zoning. Marine parks provide for multiple uses (consistent with the primary conservation objective) and, consequently, generally need to be large. The three ex-

isting marine parks are larger than other marine protected areas and sample a wide range of ecosystems, communities and species. For example, Solitary Islands Marine Park has more than 70 kilometres of ocean frontage and, together with the adjoining Commonwealth marine reserve, an area of 780 square kilometres. It includes estuaries, beaches, headlands, reefs, areas around islands, and areas of continental shelf down to 50m.

The *Marine Parks Act* established a Marine Parks Advisory Council. The Advisory Council advises the Minister for the Environment, the Minister for Fisheries and the Marine Parks Authority on statewide matters and the declaration of new marine parks. The *Marine Parks Act* also established Marine Parks Advisory Committees that advise on the planning and management of individual marine parks at the community level.

By 1999, the NSW Government had proclaimed three multiple use marine parks under the *Marine Parks Act* at the Solitary Islands (replacing the aquatic reserve), Jervis Bay and Lord Howe Island (Appendix 5).

Aquatic Reserves

Legislative Provisions:

Aquatic reserves are declared under the *Fisheries Management Act 1994* to conserve biodiversity of fish and marine vegetation and to:

- protect fish habitat or
- provide for species management or
- protect threatened species, populations and ecology or
- facilitate educational activities and scientific research.

Aquatic reserves may be declared over any land and waters. Above the mean high water mark, the consent of the owner or controlling agency is required. This is subject to 'diligent inquiry' under the *Fisheries Management Act 1994* – the same process for marine park declaration purposes. Below mean high water mark, consent is not required.

An aquatic reserve cannot be revoked, except by tabling the proposed revocation in both Houses of Parliament.

The *Fisheries Management Act 1994* provides for:

- the preparation of management plans to fulfil the objectives of the reserve
- regulation of all activities in the reserve to achieve those objectives
- the inclusion of performance objectives to monitor whether the objectives of the reserve are being attained.

The *Fisheries Management Act* also allows the making of regulations to:

- prohibit or regulate the taking of fish or marine vegetation
- provide for management, protection and development
- classify areas within an aquatic reserve for different uses.

The Minister for Fisheries is required to give the public an opportunity to make submissions on any proposed management plan.

The *Offshore Minerals Act 1999* prohibits the carrying out of mining or exploration in an aquatic reserve unless the written consent of the Minister for Fisheries is obtained. The Minister may refuse consent, or give consent subject to such terms and conditions as he or she sees as being necessary.

Dredging and reclamation in aquatic reserves are not permissible without the consent of the Minister.

The Role of Aquatic Reserves:

Aquatic reserves are relatively small areas that conserve biodiversity and complement other marine protected areas in achieving the objectives of a comprehensive, adequate and representative system. They also play an important role in protecting areas not included in other marine protected areas.

There are essentially three options for the management of aquatic reserves:

- all harvesting prohibited (ie. sanctuary zone)
- restricted harvesting (conservation purposes)
- combination of sanctuary and conservation areas.

In considering the design and management arrangements for aquatic reserves, NSW Fisheries complies the objectives of the *Fisheries Management Act 1994* and sets outcomes that::

- (a) maximise the benefits for biodiversity
- (b) consider existing uses
- (c) enable cost-effective management and enforcement
- (d) focus on impacts and treat users equitably.

Aquatic reserves are the only type of marine protected area that can be used specifically for fisheries management purposes (ie. fish refugia, habitat protection).

An Advisory Council on Fisheries Conservation has been established to advise the Minister for Fisheries on the declaration and management of aquatic reserves as well as the protection of threatened species and habitat conservation. This Committee includes members with interests in conservation, recreational and commercial fishing, aquaculture, research, and Indigenous issues.

Currently, there are eight aquatic reserves declared under the *Fisheries Management Act*. The most recent was declared around Cook Island in 1998. As aquatic reserves are relatively small, only two of the eight existing reserves (at Towra Point and Cook Island) are zoned for multiple use. Proposals exist for, and community consultation has recently been undertaken in relation to, the creation of a number of new aquatic reserves.

Zoning requirements for individual reserves are considered during the drafting of management plans. Due to the relatively small size of aquatic reserves, general use zones that are allowable in marine parks are generally not declared in aquatic reserves

National Parks and Nature Reserves

Legislative Provisions:

National parks and nature reserves are established under the *National Parks and Wildlife Act 1974* and managed by the NSW National Parks and Wildlife Service.

Within national parks and nature reserves, landscapes, ecosystems, natural phenomena and all forms of life (other than fish as defined by the *Fisheries Management Act*) are protected.

The Act also provides for the conservation of native fauna, flora and Aboriginal heritage throughout the State, not just in formally established protected areas. Reserves can also be established for recreation purposes and for the specific conservation of cultural heritage.

The Act requires preparation of a plan of management for each national park and nature reserve 'as soon as practicable' after its creation. The Act provides management objectives that must be considered in preparing the plan of management. The Minister may adopt a plan of management subject to advice from the NSW National Parks and Wildlife Advisory Council and, in the case of "submerged lands", with the concurrence in writing of the Minister for Fisheries.

The Act establishes the National Parks and Wildlife Advisory Council to advise the Minister for the Environment on protected area management and wildlife conservation. Advisory committees are also established for each region, consisting of community representatives that include park users, neighbours, local government, conservationists and Aboriginals who advise the Regional Manager and Director-General of National Parks and Wildlife on park management, wildlife conservation and other National Parks and Wildlife Service responsibilities within the region.

The passing of the Act established categories of conservation reserve for the first time, including national park and nature reserves.

The Role of National Parks and Nature Reserves:

The objectives of national parks and nature reserves in estuarine and marine areas are:

- conserving biodiversity, especially flora and fauna dependent on estuarine or marine habitats
- conserving a full range of coastal ecosystems, both terrestrial and marine, as part of an integrated protected area
- conserving species covered by the China Australia Migratory Bird Agreement and the Japan Australia Migratory Bird Agreement
- protecting threatened species, populations and ecological communities
- conserving wetlands of international significance (Ramsar Convention)
- protecting features of geological significance
- maintaining natural landscape values
- protecting wilderness
- maintaining water quality by protecting catchments

- protecting places of cultural significance to Aboriginal people
- providing opportunities for public understanding and enjoyment.

The role of national parks and nature reserves in marine protected areas is effected through the inclusion of the bed of coastal lakes and estuaries in adjoining terrestrial parks or reserves, and through marine extensions of parks and reserves to low water mark and beyond. National parks and nature reserves also protect catchment areas for aquatic reserves and marine parks.

There are now 42 national parks or nature reserves dedicated or reserved under the *National Parks and Wildlife Act 1974* that contain marine components, mostly estuaries and intertidal ocean frontage. These marine protected areas manage access to aquatic areas, helping to manage potential threats to the marine environment. Marine areas within national parks and nature reserves protect animals (including birds, mammals and reptiles) and plants, other than fish (as defined under the *Fisheries Management Act 1994*). Mining and mineral exploration are prohibited.

4 Identifying and Selecting Marine Protected Areas

The NSW Government has adopted the ANZECC *Guidelines for Establishing the National Representative System of Marine Protected Areas*, and the IMCRA bioregions (IMCRA Technical Group, 1998) as the basis for establishing and managing the NSW Representative System of Marine Protected Areas. Incorporated in the national guidelines are generic procedures for establishing the NSW Representative System of Marine Protected Areas, including suggested categories for marine protected area identification and selection criteria, and the use of the IMCRA bioregional framework.

The IMCRA Technical Group (1998) used regional patterns in biology and oceanography and characteristics of the coast and seabed to define bioregions at continental and regional scales (Figure 2). These bioregions provide a broad planning framework for development of the NSW Representative System of Marine Protected Areas.

Habitats are regarded as the most effective tool for planning a system of marine protected areas. The scale of habitats is fine enough to act as biodiversity surrogates, yet coarse enough to represent broader scale ecological processes which species-based approaches may not address. In practical terms, the IMCRA regions provide a framework to:

- identify gaps in the representation and protection of biodiversity within the NSW Representative System of Marine Protected Areas
- prioritise bioregional and site assessments
- identify gaps in biological, ecological, cultural, social and economic data
- conduct finer scale habitat mapping of biodiversity measures
- undertake bioregional and site assessments
- identify new marine protected areas and progress the establishment of the areas.

Detailed criteria and methods for identifying and selecting marine protected areas in NSW will be developed within the general context of the national guidelines (Appendix 6). The principal steps in identifying candidate marine protected areas (Appendix 7) include:

- collating data on biodiversity and biophysical features (including ecosystems, habitats and other surrogates for biodiversity)
- identifying conservation values
- identifying vulnerable ecological features
- identifying gaps in representation
- identifying candidate areas based on biological and biophysical criteria.

The identification process provides the rationale for candidate marine protected areas (preferred sites) based on biological and biophysical information. The selection process allows individuals and communities to participate and contribute social and economic information. This step aims to:

- inform the community about the identified candidate sites
- provide individuals and communities, including Aboriginal communities, with the opportunity to provide informed input into the selection process
- provide information to help maximise the conservation and socio-economic benefits and minimise any potential for adverse impacts.

Selection criteria consistent with the National Representative System of Marine Protected Areas guidelines (Appendix 6) will be developed for Aboriginal, social, economic, and scientific interests. Criteria will also be developed for manage-

ability, feasibility, and marine protected area system design, including consideration of marine protected area configuration and connectivity, replication (as insurance against extreme destructive events), and integration with terrestrial protected area management and use. Marine protected area location and size will largely be guided by the nature of protection required (purpose) to effectively conserve the species, communities, habitats, or ecological processes for which the site was identified.

The progressive development of the NSW Representative System of Marine Protected Areas will be achieved through two processes:

- Bioregional assessments – to ascertain the conservation values of the bioregion and select a suite of marine protected areas that are a comprehensive representation of biodiversity at the regional and ecosystem levels
- Site assessments – to ascertain site-specific conservation values in relation to habitats and species at smaller spatial scales.

4.1 BIOREGIONAL ASSESSMENT

Bioregional assessments use scientific and ecological criteria to systematically identify potential locations for a system of marine protected areas. A micro regionalisation approach will be adopted to map broad scale marine habitats and major patterns in marine biological diversity. These maps will be used to assess major patterns of biodiversity in marine protected areas and will provide a framework for evaluating finer scale community and species data. In this way, the conservation values and threats to marine habitats can be assessed and recommendations made on appropriate protective mechanisms.

The Marine Parks Authority, in consultation with NSW Fisheries and the NSW National Parks and Wildlife Service, will coordinate bioregional assessments.

The sequence of bioregional assessments (shown here) will enable NSW to assess all bioregions by the year 2003.

Proposed Sequence of Bioregional Assessments:

Manning Shelf
Batemans Shelf
Twofold Shelf
Hawkesbury Shelf

4.2 SITE ASSESSMENT

Site assessments will generally be triggered by gap analyses in the bioregional assessments. These analyses will provide data on an area or an environmental feature that is lacking, and thus provide information covering the whole of the bioregion. Site assessments may also be carried out for specific conservation objectives or as new information becomes available.

Although site assessments usually rely on data at a finer scale than bioregional assessments, they still rely on similar criteria to bioregional assessment in determining site significance (Appendix 6).

The declaration of marine protected areas may be based on site assessment and independent of bioregional assessments. These areas can be important in filling gaps where inadequate representation or protection of biodiversity may occur.

4.3 DECLARATION

As outlined earlier, the NSW Representative System of Marine Protected Areas includes marine parks, aquatic reserves and marine components of national parks and nature reserves.

Determining the most appropriate type of marine protected area is an element of both the assessment and selection processes. Factors that influence the type of marine protected area include:

- size
- location relative to other protected areas
- value and management needs
- the need or opportunities for cooperative management arrangements.

Declaration procedures differ for each type of marine protected area due to the requirements of the governing legislative and the policies of the supporting agency.

Marine Parks

The Governor of NSW, by proclamation, can declare a marine park under the *Marine Parks Act 1997*. A declaration does not change the ownership of land within a marine park, but must take into account existing use. Below mean high water mark, consent is not required for the declaration of a marine park. Subject to a process of due diligence, areas of land above mean high water mark cannot be declared as a marine park without the consent of the owner of the land which, in most cases, means the Crown.

The Marine Parks Authority is committed to supporting the identification and selection processes, and to consulting with the community prior to recommending to the Government the declaration of marine parks. This final step, however, will be subject to broader socio-economic assessment. It follows that not all selected sites will be declared immediately or in the recommended order.

Following the declaration of marine parks, a series of legislative requirements and policy directives are developed to govern the planning and management of these parks. These processes and policies are detailed in the remaining chapters.

5 Management

Management criteria for marine protected areas can be grouped into two broad categories:

- protection of conservation values and ecological processes
- opportunity for sustainable use and public appreciation, understanding and enjoyment.

A precautionary approach will be adopted in the management of marine protected areas to adequately conserve primary and secondary goals (Chapter 2). Principles for management to consider are:

- adequate knowledge of the biodiversity of the marine protected area
- assessment of the vulnerability of the biodiversity
- consideration of marine protected area design and extent
- allowances for recruitment and migration of species
- ecologically sustainable use
- management feasibility
- the logistics of day-to-day management.

Economic, social and cultural criteria will be assessed to determine impacts of marine protected area management on human activities. The marine environment of NSW is economically very important, particularly at the regional level, and access and opportunities for users of the resource need to be provided and appropriately managed. This access, howev-

er, should be considered in the context of the cumulative impact of all users on conservation values. The NSW Representative System of Marine Protected Areas will provide for harvesting of biological resources, provided biodiversity and cultural values are conserved.

5.1 PLANNING AND REGULATING USE

Understanding the impact of threats to the marine environment is a priority information requirement for the delivery of the NSW Representative System of Marine Protected Areas. The level of threatening processes affecting a bioregion is important in determining candidate areas for new marine protected areas. **Table 1 lists and explains potential threatening processes.**

The planning process for managing marine protected areas will be sufficiently flexible to suit local needs and conditions. The characteristics of effective planning include:

- setting goals for the process and the nature of the desired outcome
- developing a data bank on ecological, resource use, socioeconomic, and cultural information
- ensuring an appropriate level of public and stakeholder consultation at important stages of the process
- integrating the activities of relevant management agencies
- legislative support and appropriate administrative measures.

Table 1: Potential Threatening Processes

Activity	Definition and/or Effects
Climate change	Potential impacts of global warming, including sea level rise, sea temperature rise and alteration of ocean circulation patterns.
Coastal development	Includes road construction and subdivision, wetland drainage, forest clearing, damming of rivers, development of port facilities and marinas.
Competition and predation by non-indigenous species	Accidental introduction of invasive marine species through ballast water or carried on the hulls of internationally traveling vessels. In the absence of natural predators and competitors, some species quickly establish large populations that out-compete or prey upon native species. Introduced pest species can cause serious ecological damage.
Harvesting and collecting	Removal of species can affect not only the species that are directly removed, but can flow-on and fundamentally alter ecosystems by removing key species.
Fishing	Includes removal of target species, removal of bycatch species and habitat destruction.
Pollution (oil, chemicals, metals, sediments and nutrients)	Includes oil and waste disposal from vessels, food processing plants, agricultural runoff, urban runoff, stormwater drains, sewage treatment plants, mining developments, metal refineries, chemicals and metals industries.

5.2 MANAGEMENT PLANNING FOR MARINE PROTECTED AREAS

Management plans will detail the manner or scheme under which a marine protected area will be managed over a given period, generally five years. These plans will provide a framework for the development of work programs that meet the objectives of the area and include procedures that link management, research and compliance. Generally, plans will detail a wide range of management issues and management policies including user management, activity management, guidelines, research and monitoring, maintenance of programs and equipment and development of assessment procedures.

Management and operational plans are important in developing community understanding about management intent and will be prepared by the relevant authority as soon as practicable after the declaration of a marine protected area. Plans will clearly state the aims and goals of the area and will give priority to developing performance indicators and implementing programs to monitor biodiversity conservation and ecosystem integrity.

Management structures for coordination of day-to-day management in marine protected areas are important to ensure the consistent application of management policies and coordination of agency resources. A generic planning process for marine parks has been prepared by the Marine Parks Authority (Appendix 8). The process is based on an analysis of best practice in resource management planning with reference to the constraints on planning under the NSW legislative and administrative framework. Key milestones in the planning process include:

- preparation of an issues paper
- development of a draft zone plan for public exhibition
- preparation of regulations to support the zone plan.

Appendix 8 also provides further detail and guidelines on zoning and operational planning for marine parks.

Operational Plans for Marine Parks

As soon as practical after declaration of a marine park, the Marine Parks Authority will prepare an operational plan.

Operational plans clearly state the aims and goals of the marine park and are also important in developing community understanding about management intent.

Operational plans detail how the Marine Parks Authority will manage and operate a marine park over five years. Operational plans include performance indicators and programs to monitor the maintenance of ecosystem integrity and conservation of biodiversity.

Components of marine park management and operational plans are generally linked with the zoning plan, administrative arrangements, and compliance and education strategies.

In conjunction with zoning plans and operational plans, general management tools are used. These are defined by regulation and described generically so they can be applied across all zones. General management tools include the use of permits and licenses to manage designated activities, the use of closures to regulate all activities in a given space and time, and other legislative controls that apply to marine parks.

Zone Types

Four generic zones will be used in NSW Marine Parks – sanctuary, habitat protection, general use and special purpose. These zones are detailed in the *Marine Parks Regulation 1999*:

- **Sanctuary zones** allow for total protection of marine animals and plants and their habitat. Activities that involve harming any animal, plant or habitat are prohibited
- **Habitat protection zones** give protection to habitat, but allow limited taking of specified fish and plants. Only activities that do not have a significant impact on fish populations and have a negligible impact on other animals, plants and habitat are permitted.
- **General use zones** allow multiple use, as long as these are ecologically sustainable. (It is important to understand that these zone areas do not function the same as areas outside marine parks.) Activities in general use zones are subject to generic regulations that apply across the whole park, including permits. Activities in these zones will be scrutinised to ensure that they are ecologically sustainable
- **Special purpose zones** are used when special management systems are required, including protection of Aboriginal and other cultural features, marine facilities, or for specific park management reasons.

Permits and Licenses

Regulating permitted activities within marine protected areas may require permits or licenses. Permits are important in the management of activities that could impact on marine life and human use of the park. To manage these activities, permit and licence numbers can be limited (capped).

Activity Assessment

On-going management requires overall assessment of human activities. For uses needing permits, an assessment of environmental impacts will be required. Best practice guidelines for ecologically sustainable use will be developed for all user activities and, when appropriate, will form part of core permit conditions.

Temporary Closures

Temporary closures are recognised as an essential management tool for all marine protected areas and can be used to limit or ban activities. Fishing closures under the *Fisheries Management Act* can augment or support marine protected areas and can be declared for up to five years by the Minister for Fisheries. These closures can apply to all NSW waters and all marine protected area types.

The Minister for the Environment and the Minister for Fisheries can jointly prohibit or place restrictions on the carrying

out of any activity, including fishing, in a marine park by notifying a marine park closure for up to five years.

General Regulations

Activities in marine protected areas are regulated by the *Marine Parks Act 1997*, *Fisheries Management Act 1994*, and the *National Parks and Wildlife Act 1974* and associated Regulations. There are also other NSW Acts and Regulations that operate in conjunction with marine protected area legislation. These include:

- *Threatened Species Conservation Act 1995*
- *Protection of the Environment Operations Act 1997*
- *Coastal Protection Act 1979*
- *Environmental Planning and Assessment Act 1979*
- *Native Title (NSW) Act 1994*
- *Heritage Act 1977*
- *The Historic Shipwrecks Act 1976*
- *Wilderness Act 1987*.

To optimise conservation outcomes, the NSW Government will, whenever possible, integrate the use of this legislation so implementation of regulations under these Acts can be coordinated in marine protected areas.

Joint Arrangements

Liaison and cooperation between the agencies responsible for marine protected areas will be essential to achieve the goals of the NSW Representative System of Marine Protected Areas. There are many opportunities for the different, and complementary, characteristics of the agencies and their legislation to achieve better outcomes than any agency alone. Examples include:

- using a fisheries closure to protect fish in a national park
- protecting the water quality of an aquatic reserve by incorporating its catchment into a national park.

Liaison and cooperation with other land management and planning agencies will be used to more effectively address a wider range of issues affecting marine protected areas. In particular, coastal development issues such as urban run-off, storm-water drainage, effluent discharge, erosion and sedimentation in areas adjacent to marine parks can be addressed.

Joint arrangements ensure the efficient use of resources and clarify respective roles and functions of the participants. It is recognised that individual management arrangements will also be adopted by marine protected area management agencies.

Existing and proposed joint management arrangements for marine protected areas include:

- NSW Fisheries and NSW National Parks and Wildlife Service for their respective involvement in administering and managing marine parks under the *Marine Parks Act*
- Marine Parks Authority and Environment Australia for adjacent marine park planning and management
- Marine Parks Authority and Department of Defence for use of marine parks

- Marine Parks Authority and NSW Waterways (an operational arrangement was agreed in March 1999)
- Marine Parks Authority and the Lord Howe Island Board for management of the Lord Howe Island Marine Park and World Heritage Area
- Marine Parks Authority and the NSW Department of Land and Water Conservation for development consent matters in marine parks
- Marine Parks Authority and local councils for development consent and catchment protection issues adjacent to marine parks
- NSW Fisheries and NSW National Parks and Wildlife Service for fisheries closures in various national parks and nature reserves, eg. Bouddi National Park.

5.3 MANAGEMENT PLANNING FOR AQUATIC RESERVES AND NATIONAL PARKS AND NATURE RESERVES

Management Plans (Aquatic Reserves)

Under the *Fisheries Management Act 1994*, management plans may be prepared for aquatic reserves. These plans include the objectives of the aquatic reserve and regulate activity. Management plans may include performance indicators to monitor whether the objectives of the reserve are being attained, and are general enough to ensure that any other matter under the *Fisheries Management Act* and *Aquatic Reserve Regulations* can be incorporated. Management plans may also include a zone scheme but, when possible, aquatic reserve zone descriptions complement zones described under the *Marine Parks Act*.

Plans of Management (National Parks and Nature Reserves)

A plan of management is required as soon as practical after the establishment of national parks and nature reserves. The plan must address the following objectives:

- conservation of wildlife
- protection of special features
- prohibition of works adversely affecting the natural condition or special features of the area
- preservation of historic or Aboriginal features
- regulation of appropriate use (nature reserves)
- encouragement and regulation of appropriate use, enjoyment and understanding (national parks)
- preservation as a catchment area
- protection against fire and erosion
- setting apart an area as wilderness
- land acquisition for access and management.

Each plan of management includes a table of actions. Plans can be reviewed at any time, but a five-year review period is common.

Planning and management objectives may be achieved by a variety of measures including regulation (use restrictions), permit conditions, closures, and other legislative powers under the *Fisheries Management Act 1994* and the *National Parks and Wildlife Act 1974*.

5.4 MANAGEMENT COMPLIANCE

Effective management of marine protected areas requires that those who use them are aware of and understand the values of the areas, comply with the protection measures, and help ensure visitor enjoyment and safety. Compliance strategies must therefore include elements of both education and enforcement.

General community consultation and education mechanisms are covered in detail in Chapter 6. For compliance purposes, however, information needs to target users by:

- summarising the main values and features of the particular marine protected area
- focusing on the needs of these groups, showing the potential effect of their activities on the marine protected area and other users, and advising sound environmental practices
- outlining concisely the management controls applying to particular activities or localities in the marine protected area
- providing advice on the penalties for non-compliance.

Information mechanisms need to include brochures, signs, permits showing conditions, information from those providing visitor services (such as charter boat operators) and face-to-face advice during ranger patrols.

The aim should be to achieve the highest levels possible of voluntary compliance. Important principles for maximising voluntary compliance include:

- keeping stakeholders involved generally, but especially in developing compliance strategies
- active education to improve understanding and acceptance of rules
- ensuring that rules are administered fairly and reasonably.

The other essential aspect of management compliance is enforcement. This includes effective deterrence, monitoring and surveillance and adopting risk management principles to identify important sites, places and times for illegal or harmful activities.

Communicating the outcomes of successful enforcement also plays a very important role in deterring potential offenders. Local print and electronic media are effective in reaching many park users and providing advice on the offence, the penalty and ways to avoid offending.

Important principles that need to be considered in creating effective deterrence for marine protected areas include:

- monitoring and surveillance campaigns that increase presence in the area generally and the likelihood of offenders being detected
- improving the probability of successful prosecutions
- providing a penalty framework and compliance strategy that ensures the costs of offending outweigh the benefits.

Enforcement of Marine Park Regulations, including zoning plans, will be carried out by NSW Fisheries, the National Parks and Wildlife Service, NSW Police and staff seconded to the Marine Parks Authority. As these officers have large areas to patrol, compliance staff will be given authority as Marine Park Rangers to enforce NSW Fisheries, National Parks and Wildlife and Marine Parks legislation that pertains to Marine Parks. When practical, joint patrols of staff from Marine Parks, the National Parks and Wildlife Service, NSW Fisheries, Waterways, Customs and Police will be arranged.

NSW Fisheries and the National Parks and Wildlife Service will provide cross compliance under their legislation when appropriate. These cases may include:

- authorising National Parks and Wildlife Service officers under the *Fisheries Management Act 1994* when an aquatic reserve or fisheries closure is within or adjoins a national park or nature reserve
- authorising NSW Fisheries officers under the *National Parks and Wildlife Act 1974* to protect marine mammals, birds and reptiles, or to enforce regulations within national parks and nature reserves.

The *Historic Shipwrecks Act 1976*, *Threatened Species Conservation Act 1995* and *Protection of the Environment Operations Act 1997* also have implications for management of marine protected areas. When possible, compliance staff from the Marine Parks Authority, NSW Fisheries and the National Parks and Wildlife Service will be given authority to enforce these Acts as they pertain to marine protected area management.

6 Community Consultation

Community support is essential to protecting the marine environment. This support can only be gained if people are properly informed and educated about the value of marine protected areas. Opportunities for community participation, input into management and knowledge of the benefits of marine protected areas generate a sense of stewardship in the local community that will contribute to the success of the marine protected area.

Community education and awareness programs have proved essential to the effective management of marine protected areas both in Australia and throughout the world.

Principles for community participation and education for marine protected areas are:

- community stakeholders and Aboriginal participation will be actively sought for selection, planning and management of marine protected areas
- management of marine protected areas will involve effective consultation and close links with stakeholders.

Conservation of biodiversity requires education about marine protected areas to inform key government departments, non-government offices, community groups and individuals on the ecological, economic and social benefits of marine protected areas.

Indigenous people can improve community awareness of the cultural and economic importance of marine protected areas to Indigenous people. Indigenous knowledge can be used in marine protected area planning and management. Subject to intellectual property rights, customary knowledge should be included in park resource assessments, research programs and management.

Community involvement is critical in the selection and declaration of marine protected areas because social, economic and cultural issues need to be considered in deciding which areas to include in the marine protected area system. Accordingly, the NSW Government proposes to consult widely with the community and stakeholders.

Once marine protected areas are declared, the preparation of management plans will involve public participation at several levels and stages (Table 2). Zoning plans and operational plans under the *Marine Parks Act 1997* and plans of management under the *National Parks and Wildlife Act 1974* must be placed on public exhibition. In the leadup, substantial consultation on management and planning issues will also occur. Special arrangements will be made to consult Indigenous groups.

Community consultation and participation will not stop with adoption of planning and management plans. The community will be kept up-to-date with management outcomes, marine conservation news, user conflicts, and awareness of park regulations and plans.

Table 2: Community Consultation Opportunities for NSW Marine Parks

Stage	Outputs	Actions
1. Design planning stage.	Draft planning process.	<ul style="list-style-type: none"> • Internal consultation • Public consultation.
2. Data collection and issue identification.	Collation and assessment of management and planning issues. Information maps.	<ul style="list-style-type: none"> • Public consultation • Stakeholder survey • Habitat mapping.
3. Develop management options.	Issues paper.	<ul style="list-style-type: none"> • Apply zoning criteria and methods • Public consultation.
4. Select preferred option and prepare draft zoning plan.	Draft zoning plan.	<ul style="list-style-type: none"> • Prepare draft zoning plan.
5. Formal public review	An informed public.	<ul style="list-style-type: none"> • Advertise and display draft plans • Invite and collate public submissions.
6. Revise zoning plan and develop regulations.	Final zoning plan and regulations.	
7. Implementation.	Public information materials.	<ul style="list-style-type: none"> • Public awareness feedback and education program.

6.1 ADVISORY COMMITTEES

Ongoing community and stakeholder participation in marine protected area management is enhanced through advisory bodies. These committees may advise relevant Ministers and marine protected area agencies on:

- proposals for marine protected areas
- conservation of marine biodiversity and ecologically sustainable use within marine protected areas
- matters relating to the operations of marine protected area legislation
- planning and management of marine protected areas.

Generally, advisory committees include representatives of key stakeholder groups. For example, under the *Marine Parks Act 1997*, the Marine Parks Advisory Council includes representatives from the National Parks and Wildlife Service, NSW Fisheries, the Commonwealth Government, two from marine conservation (with at least one an expert in marine conservation), marine science, Indigenous people, tourism, commercial fishing, recreational fishing and scuba diving. Local Marine Park Advisory Committees have at least nine representatives including the stakeholder groups listed here, together with local government representatives.

These committees are important forums to focus key stakeholder views and issues involved in the operations of marine protected areas at all levels.

Some key advisory committees, such as the National Parks and Wildlife Service Regional Advisory Committees and NSW Fisheries Advisory Council on Fisheries Conservation, will also play an important role in providing advice to the relevant Ministers on matters associated with the establishment of a representative system of marine protected areas. To facilitate the exchange of information, the Marine Parks Authority will foster communication with these advisory committees.

6.2 INDIGENOUS PARTICIPATION

As Indigenous participation and support is essential to effectively create, plan and manage marine protected areas, Indigenous representatives will normally be included on marine protected area advisory committees, including the Marine Parks Advisory Council.

Aboriginal people are already taking the initiative in some areas. For example, Aboriginal people at Solitary Islands and Jervis Bay have created their own consultation groups to assist with their input into marine park advisory committee meetings.

The knowledge of Indigenous communities should also be incorporated into marine protected area interpretation and education strategies.

6.3 EDUCATION

Eighty percent of NSW people live on the coast (Zann, 1996) and most are highly mobile. Therefore, programs aimed at educating the public about conserving the marine environment and the value of marine protected areas require a move from community to a statewide focus.

There is a need for a widespread education strategy that highlights the impact of human activity on the marine environment, the role of marine protected areas and the reason for management plans and special arrangements.

For example, the Marine Parks Authority at Solitary Islands Marine Park has made a concerted effort to implement a wide range of education and interpretative programs for both the local community and visitors. Successful strategies include tours of the park, distributing information to visitor information centres throughout the region, guest lectures, and school information sessions.

During school holidays, the NSW National Parks and Wildlife Service runs popular and regular Ranger Discovery programs that feature the life of intertidal ecosystems within, or adjacent to national parks.

Marine protected area agencies will assist groups and community programs whose main objective is educating the public about marine conservation. Integrating with existing programs (eg. Coastcare) will optimise use of resources and minimise duplication. Distribution of information from other marine education programs and providing these programs with educational material are cost-effective ways to promote marine protected areas in NSW.

Both generic and comprehensive information on the NSW Representative System of Marine Protected Areas will be provided. Displays, brochures, posters and promotional material may be used at state, regional or local levels. For example, the publication and wide distribution of a Marine Parks newsletter will inform communities of marine park issues.

The Marine Parks Authority also recognises the need to provide information about the aims and objectives of marine protected areas to people of non-English speaking background. It is planned to provide relevant information in a number of community languages to facilitate greater understanding of and appreciation for marine protected areas.

7 Research and Monitoring

Evaluating the effectiveness of marine protected areas in conserving marine biodiversity is recognised by the NSW Government as a priority in establishing and managing the NSW Representative System of Marine Protected Areas. Evaluation is a target in the current strategic plan of the World Commission on Protected Areas.

Knowledge of spatial distributions and changes in species, habitats, and ecosystem processes is crucial to effective conservation. Information on social, economic and cultural values assists in understanding and managing conflict, improves consultation education and compliance, and optimises benefits to the community.

Research and monitoring will be used to:

- establish a comprehensive, adequate and representative system of marine protected areas that includes a full range of marine biodiversity at ecosystem, habitat and species level
- provide baseline estimates of natural variation
- monitor impacts on these natural conditions
- trigger and prioritise management responses
- determine strategies for managing specific areas, ecosystems, species, and threats
- determine strategies for integrated management of wider issues
- monitor the success of management in conserving biodiversity
- direct future management, research and monitoring.

Analysis of this information together with specific indicators of management performance will be used to strategically address marine protected area objectives, review progress and improve marine conservation in NSW. Details on how this will be achieved are outlined in an overall Marine Parks Research Strategy that will be used to formulate research plans for individual marine parks.

There will be two main types of research and monitoring programs for marine protected areas in NSW: those which directly address questions of importance to ongoing management, and those which provide relevant information about biotic or abiotic patterns or processes in a marine park. In general, projects of the first type will have highest priority, but other research (which often will be undertaken by external research providers) will be facilitated and encouraged whenever possible.

Research and monitoring will be categorised under four areas that include subgroups. This classification system will form the basis for developing research plans and help

identify information gaps. The recommended scheme is:

1. Biodiversity and ecological processes

- habitats
- species
- ecological processes.

2. Indigenous and non-Indigenous culture and heritage

- Aboriginal culture
- heritage.

3. Ecologically sustainable use

- fishing
- recreation and tourism
- development and infrastructure

4. Specific impacts

- visual amenity
- pollution
- pests and weeds

7.1 KEY RESEARCH AREAS

For effective monitoring that entails limited amounts of time and money for research, it is important to identify surrogate (indicator) measures that reflect patterns of biodiversity over large, continuous areas. In most cases, this will involve interpolation between data points and assumptions about what the measures represent on the ground. The ability to reliably predict patterns of biodiversity from survey data will depend on the careful choice of measures and sampling designs.

Developing a suite of suitable indicators is the first priority and will depend on what is being monitored and tested. Indicators should be sensitive to changes in research objectives but robust enough to confound other variations. Indicators will be various and include biotic and abiotic elements. A range of biodiversity indicators has already been suggested for reporting the state of the environment at a national level and appropriate indicators will be incorporated in the monitoring of NSW marine protected areas (Appendix 9).

Large variations are characteristic of natural environments. Incorporating this variation into research programs is difficult yet important if results are to be meaningful. In identifying suitable indicators, it will be crucial to examine the inertia,

resilience and stability of natural populations and to find out more about ecosystems, habitats and species within the marine protected area.

Current knowledge of ecosystem patterns and processes is generally poor, though ideally this knowledge should form the basis for management. Long-term studies are necessary but, in the short-term, decisions will need to be precautionary and reviewed regularly as more scientific information becomes available. For many species, there is a need to address taxonomic problems in identification.

Spatial and temporal variation in human impacts adds extra complexity to the already difficult task of assessing variable marine environments. Impacts may be sustained (long-term) or episodic (short-lived), operate over hundreds of kilometres, and affect ecosystems in ways that are difficult to predict or detect.

Anticipating and managing these impacts is a major challenge for marine protected area management. Risk assessments will be carried out for in marine protected areas and will include analysis of threats, and strategies to avoid, minimise and, when necessary, remediate damage.

Identification and management of threats will require information on cultural, social and economic values in marine environments. Research and monitoring of human use will also help provide for the sustainable use and public appreciation, understanding and enjoyment of marine protected areas.

Monitoring to assess the effectiveness of management will be one of the most important mechanisms for feedback, though in many cases this monitoring can only be useful on timescales of at least 5 to 10 years. This feedback will enable alternative management strategies to be implemented if existing actions are found wanting. For example, zoning in marine parks is a fundamental tool to protect biodiversity. Failure of zones to achieve their desired outcomes, especially the adequate protection of the full range of processes, habitats and species in the region, may be a design fault, a compliance issue or indicate the need for other management action, including revised zoning. Research and monitoring can provide indications of which ecosystems, habitats or species require protection, identify how to increase compliance from marine protected area users and show which broader ecosystem processes need protection in areas surrounding the marine protected area. Finally, research and monitoring is required to gauge the effectiveness of these measures and how they can be improved or applied elsewhere.

7.2 RESEARCH COORDINATION

Marine protected area agencies, universities, local government, consultants, and the local community will be encouraged to participate to ensure effective research and monitoring of NSW marine protected areas. However, it is important to coordinate this effort.

The time and resources required for effective research are considerable. Marine protected area research must be cost-effective, focus on marine protected area objectives and re-

viewed regularly. It is also important that research and experience in related fields is made available to marine protected area managers. Integrating research expertise from various agencies will make the best use of available information.

As research and monitoring is integral to marine protected area management, monitoring programs must have strict standards of design and execution. Studies need to address management objectives as closely as possible and use the most reliable, cost-effective scientific methods. Measures should accurately reflect the environmental and biological phenomena targeted in research objectives, and designs should aim to minimise confounding of interpretation of results. Designs should account for short and long-term variation at different spatial scales and should clearly recognise underlying assumptions and design limitations. Marine protected area research and monitoring proposals will be tested and peer reviewed before committing resources, and final outputs will also be reviewed.

Whenever possible, research and monitoring outputs will be tailored to link closely with marine protected area management. For example, impacts of a specific magnitude may be used to trigger management intervention and research may be used to predict and minimise future impacts or remediate the effects of severe disturbances.

Management will also make the best use of information from previous and related studies through an adaptive management process. Existing expert knowledge, literature, surveys, databases, records, maps, photographs, public submissions, local and Indigenous knowledge will all be collated and used in guiding research and management decisions.

All research will adhere to the ASTEC guidelines for the ethical conduct of research in protected and environmentally sensitive areas.

8 Performance Assessment and Reporting

ANZECC (1999) has published a Strategic Plan of Action for the National Representative System of Marine Protected Areas. The Plan sets out actions for developing and implementing a performance assessment framework. This framework includes a number of elements that contribute to the best practice model for marine protected area management.

NSW will contribute to the development of this national framework and will adapt performance assessment criteria for the NSW Representative System of Marine Protected Areas and each marine protected area.

Assessing the effectiveness of the NSW Representative System of Marine Protected Areas in meeting its goal will need to be scaled, ranging from national and international significance down to state, bioregion and individual marine protected area. Evaluation of CAR criteria at all scale levels will be fundamental to determining the effectiveness of the marine protected area system and its management.

The key objectives for performance assessment are:

- evaluate the effectiveness of the NSW Representative System of Marine Protected Areas in meeting its goal and objectives
- assist in identifying ways to increase its effectiveness.

Elements of the performance assessment framework will include:

- translating the objectives of the NSW Representative System of Marine Protected Areas and individual marine protected areas into quantifiable targets and/or standards
- using the targets and/or standards or developing appropriate indicators for assessing performance

- developing a concise reporting system using, when possible, existing processes.

The overall ecological effectiveness of the NSW Representative System of Marine Protected Areas will largely depend on the design of the system and the management of each area. Accordingly, detailed performance criteria will be developed to evaluate the effectiveness of individual marine protected areas in achieving their respective biodiversity conservation objectives. These criteria will be factored into the monitoring and management programs for each marine protected area, and will include effectiveness review of management and zoning plans, implementation of research and monitoring, and compliance assessment strategies.

Reporting time frames will depend on National and State requirements but will include:

- annual performance information for Government annual reports
- annual information to review park budgets and work plans
- quarterly information to up-grade the Marine Parks Authority's work plan
- regular updates to stakeholders and marine park users, relevant committees and agencies
- performance information to review zoning and operation plans every five years
- formal review of regulations every five years.

9 Glossary

Adequacy	The maintenance of the ecological viability and integrity of populations, species and communities (ANZECC 1999).
Biodiversity	The variety of life forms: the different plants, animals and micro-organisms, the genes they contain, and the ecosystems they form. It is usually considered at three levels: genetic diversity, species diversity and ecosystem diversity (NPWS 1999).
Bioregion	An area defined by a combination of biological, social and geographic criteria, rather than by geopolitical considerations. Generally, a system of related, interconnected ecosystems (ANZECC 1999).
Comprehensiveness	Includes the full range of ecosystems recognised at an appropriate scale within and across each bioregion (ANZECC 1999).

Ecologically sustainable use	Using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained and the total quality of life, now and in the future, can be increased.
Ecosystem	All the organisms in a community in a given area in interaction with their abiotic (non-living) environment and each other.
Efficacy	Capacity to produce effects.
Endemism	Originating in a given area and confined to that area. (NPWS 1999)
Exclusive economic zone	The area between the lines 12 nautical miles and 200 nautical miles seaward of the territorial sea baselines.
Fish	Marine, estuarine or freshwater fish or other aquatic animal life at any stage of life history (whether alive or dead). Fish includes oysters and other aquatic molluscs; crustaceans; echinoderms; beachworms and other polychaetes (<i>Fisheries Management Act</i>). Fish does not include whales, marine mammals, reptiles, birds or amphibians.
Habitat	The living space of a species or community, providing a particular set of environmental conditions (Appendix 9) (NPWS 1999).
Marine vegetation	Any species of plant that at any time in its life must inhabit water (other than freshwater)(<i>Fisheries Management Act</i>).
Naturalness	The extent an area is free from human induced change.
NSW waters	The area between the territorial sea baseline and three nautical miles, under the jurisdiction of the State of NSW.
Representativeness	Marine areas selected for inclusion in reserves should reasonably reflect the biotic diversity of the marine ecosystems from which they derive (ANZECC 1999).

10 Abbreviations

ANZECC	Australian and New Zealand Environment and Conservation Council
ASTEC	Australian Science, Technology and Engineering Council
CAR	Comprehensive, adequate and representative
IMCRA	Interim Marine and Coastal Regionalisation for Australia
IUCN	World Conservation Union (formerly known as International Union for the Conservation of Nature and Natural Resources)
MPA	Marine Parks Authority
NPWAC	National Parks and Wildlife Advisory Council
NPWS	NSW National Parks and Wildlife Service

11 Suggested Reading

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12. Appendices

APPENDIX 1.

POLICIES AND STRATEGIES FOR ESTABLISHING A REPRESENTATIVE SYSTEM OF MARINE PROTECTED AREAS IN NSW

Level of Significance	Policy Document	Reference to Developing Marine Protected Areas
International	International Convention on Biological Diversity (1993)	Article 8(a), (b), (c) Article 13(b)
	Strategic Plan of the World Commission on Protected Areas (1996)	CNPPA, 1996
	Inter-Government Agreement on the Environment (1992)	Schedule 9 part 1 Schedule 9 part 13
National	National Ecologically Sustainable Development Strategy (1992)	Objective 2.3 Objective 10.1
	National Biodiversity Strategy (1996)	Objective 1.3 - action 1.3.3 Objective 1.4 - actions 1.4.1, 1.4.2 Objective 4.1 - action 4.1.4(a) & (b) Objective 5.1 - action 5.1.2 Objective 7.1 - action 7.1.1(e) & (f)
	Australia's Oceans Policy (1998)	Conservation of Marine Biological Diversity Actions p23 (Volume 1) Skills Development & Community Participation, Information & Education Actions p27 (Volume 2)
	National Representative System of Marine Protected Areas Guidelines for Establishing the National Representative System of Marine Protected Areas Strategic Plan of Action for Establishing the National Representative System of Marine Protected Areas Interim Marine and Coastal Bioregionalisation for Australia (1998)	All sections
	NSW Biodiversity Strategy (1999)	Objective 2.2 - action 30 Objective 2.3 - action 34 Objective 5.2 - action 172
State	NSW Coastal Policy (1997)	Objective 1.1 - actions 1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.10 Objective 8.4 - action 8.4.1

APPENDIX 2.

OTHER TOOLS FOR MARINE CONSERVATION IN NSW

Marine protected areas are not the only means for conserving marine biodiversity in NSW. Other techniques and mechanisms are used to manage impacts on biodiversity within marine or estuarine environments, including catchment-derived threats associated with urbanisation and other land uses. The NSW Aquatic Biodiversity Strategy, once finalised, will detail how these protective measures can work together to achieve ongoing conservation of marine biodiversity.

Fishing Closures

Fishing closures are areas (gazetted under the *Fisheries Management Act*) which prohibit fishing, either absolutely or by imposing certain conditions, for example on fishing methods or catch. Fishing closures can be any size and can restrict fishing activities in certain areas all year round or at certain times. They can remain in force up to five years, but the Minister may extend, amend or revoke a closure with a further notification. In some cases, fishing closures have been in place and consistently enforced for over 40 years. There are currently over 300 fishing closures along the NSW coast, including 14 intertidal protected areas (special purpose fishing closures) for the conservation of intertidal invertebrate biodiversity in the Sydney area.

Other Fisheries Management Tools

In addition to closures, fishing activities are managed by limiting the fishing gear that can be used, the quantity, type and size of fish that can be taken, and the number of commercial fishers that can access the resource. Comprehensive management plans are gradually being developed for all major fisheries in NSW (ie. the nine major restricted commercial fisheries and the recreational fishery). These plans are based on environmental assessments of the full range of impacts, including impacts on other components of the marine ecosystem.

Habitat Protection Plans

Habitat protection plans are developed under the *Fisheries Management Act* for the protection of any fish habitat, whether essential to the survival of a species (including critical habitat) or required to maintain harvestable populations. A plan may protect habitat that is used for spawning, shelter or other reasons. It must specify the particular habitat features and may set practical methods to protect the habitat. Three Habitat Protection Plans have already been prepared to deal with general habitat issues (HPP1), seagrasses (HPP2) and the Hawkesbury-Nepean River System (HPP3).

Threatened Species Management

The impacts of human activities have led to a decline in the numbers and distribution of many native species in NSW, putting some in danger of extinction. Threatened species, populations and ecological communities of fish (including aquatic invertebrates) and marine vegetation (including mangroves, seagrasses

and macroalgae) can be listed under the *Fisheries Management Act*. Any person can nominate a species, population or ecological community for assessment by an independent Fisheries Scientific Committee which makes recommendations to the Minister. Other marine species not covered by the *Fisheries Management Act*, such as marine mammals, seabirds and reptiles, can be listed under the *Threatened Species Conservation Act*, administered by the National Parks and Wildlife Service. Species can be listed as vulnerable, endangered or presumed extinct. Populations and ecological communities can be listed as endangered.

Recovery plans must be prepared for all listed threatened species, populations and communities to promote their recovery to a position of viability in nature. Recovery planning is carried out in full consultation with scientific experts and the community.

The *Fisheries Management Act* also provides for identifying and declaring critical habitat, which is the whole or any part of the habitat of an endangered species, population or ecological community that is critical to its survival. Once declared, the location of the critical habitat must be identified in relevant environmental planning instruments, such as Local Environmental Plans administered by local government.

There are also provisions under the *Fisheries Management Act* and *Threatened Species Conservation Act* for listing key threatening processes that are likely to jeopardise the survival of listed threatened species, populations or ecological communities, or cause others that are not threatened to become threatened. Threat abatement plans must be prepared for any listed key threatening processes.

Environmental Assessment and Development Controls

The *Environmental Planning and Assessment Act* specifies categories of development that require consent. The circumstances that require assessment of the environmental impacts can include assessment of the impacts on marine ecosystems or species. For example, the consent or determining authority for a development or activity (usually a State government agency or local council) must consider the effect on threatened species, populations or ecological communities of the proposed development. When a significant impact is likely, a detailed Species Impact Statement must be prepared. In the case of threatened fish or marine vegetation, the consent or determining authority must seek the concurrence of the Director of Fisheries or, in certain circumstances, consult with the Minister for Fisheries.

Pollution Control

Pollution of aquatic systems is regulated by the NSW Environment Protection Authority, responsible for pollution and waste licensing, pollution reduction programs and compliance audits as well as other strategies such as environmental education and economic instruments and incentives. Traditional forms of regulation are increasingly being extended by other measures such as economic tools, negotiated industry agreements, codes of practice and financial assurances. There are also various initiatives at the national level to address marine pollution issues, such as pollution from ships and oil spill events. These include the Na-

tional Plan to Combat Pollution of the Sea by Oil and Other Noxious and Hazardous Substances and the National Marine Oil Spill Contingency Plan for dealing with oil spill emergencies.

Marine Pest Management

Concern is increasing over the introduction of marine species into Australian waters via ballast water, fouling on hulls of boats, transport for aquaculture and the aquarium trade. Some species have the potential to cause considerable ecological and economic impacts. At the national level, a National Policy for the Translocation of Live Aquatic Organisms, a National System for the Prevention and Management of Introduced Marine Pests and an Australian Ballast Water Management Strategy have been developed. NSW will develop complementary State programs for marine pest management. There are already provisions under the *Fisheries Management Act* for declaring species of fish or marine vegetation noxious, making it an offence to sell, possess or cultivate the species.

Community Initiatives

Many individuals and organisations are already involved in programs aimed at assisting in the conservation of marine biodiversity, such as Oceanwatch, Coastcare and Fishcare Volunteers, and non-government conservation groups and networks. Recent initiatives in catchment management and natural resource management also focus on a more grassroots approach to biodiversity conservation.

Natural Resource Management Policies and Plans

Threats to marine and estuarine areas, particularly due to land use practices, may be managed through the development of estuary and catchment management plans. These are developed by management committees, composed of both government and non-government representatives, and are designed to focus community, industry and government efforts on more coordinated and integrated management of natural resources (eg. land, water and vegetation). The plans are advisory and require implementation through supporting legislation, often by local governments. Plans can incorporate a range of mechanisms, which may be applied by local governments, including stormwater control plans and soil and water controls.

Conservation Agreements

Voluntary conservation agreements (VCAs) are joint agreements between a landholder and the Minister for the Environment that allow the natural, cultural and/or scientific values of an area of land to be permanently protected. They are voluntary, but once completed are binding on both parties and run with title, meaning they remain in force even when the land is sold to another person. VCAs may restrict the use of the land, specify which activities will or will not be carried out by the landowner and may require the Minister to provide funds, carry out works and provide technical or other assistance. VCAs could benefit marine areas by protecting adjacent land areas and could potentially be expanded to incorporate specific measures for aquatic biodiversity conservation (eg. protection or restoration of wetland areas).

APPENDIX 3. IUCN PROTECTED AREA MANAGEMENT CATEGORIES

Category Ia: Strict Nature Reserve: protected area managed mainly for science.

Area of land and/or sea possessing some outstanding or representative ecosystems, geological or physiological features and/or species, available primarily for scientific research and/or environmental monitoring.

Category Ib: Wilderness Area: protected area managed mainly for wilderness protection.

Large area of unmodified or slightly modified land, and/or sea, retaining its natural character and influence, without permanent or significant habitation, which is protected and managed to preserve its natural condition.

Category II: National Park: protected area managed mainly for ecosystem protection and recreation.

Natural area of land and/or sea, designated to:

- protect the ecological integrity of one or more ecosystems for present and future generations
- exclude exploitation or occupation inimical to the purposes of designation of the area
- provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible.

Category III: Natural Monument: protected area managed mainly for conservation of specific natural features.

Area containing one or more specific natural or natural/cultural feature which is of outstanding or unique value because of its inherent rarity, representative or aesthetic qualities or cultural significance.

Category IV: Habitat/Species Management Area: protected area managed mainly for conservation through management intervention.

Area of land and/or sea subject to active intervention for management purposes to ensure the maintenance of habitats and/or to meet the requirements of specific species.

Category V: Protected Landscape/Seascape: protected area managed mainly for landscape/ seascape conservation and recreation.

Area of land, with coast and sea as appropriate, where the interaction of people and nature over time has produced an area of distinct character with significant aesthetic, ecological and/or cultural value, and often with high biological diversity. Safeguarding the integrity of this traditional interaction is vital to the protection, maintenance and evolution of such an area.

Category VI: Managed Resource Protected Area: protected area managed mainly for the sustainable use of natural ecosystems.

Area containing predominantly unmodified natural systems, managed to ensure long term protection and maintenance of biological diversity, while providing at the same time a sustainable flow of natural products and services to meet community needs.

APPENDIX 4.

NSW MARINE PROTECTED AREA LEGISLATIVE AND ADMINISTRATIVE REQUIREMENTS

	Marine Parks	Aquatic Reserves	National Parks & Nature Reserves
Legislation	<i>Marine Parks Act</i>	<i>Fisheries Management Act,</i>	<i>National Parks and Wildlife Act</i>
Responsible agency	Marine Parks Authority	NSW Fisheries	National Parks and Wildlife Service
Objectives	Conserve marine biological diversity and marine habitats; maintain ecological processes; and where consistent with the preceding objects provide for ecologically sustainable use of fish; and provide opportunities for public appreciation, understanding and enjoyment.	Conserve biodiversity of fish and marine vegetation and, consistently with this purpose: protect fish habitat; or provide for species management; or protect threatened species, populations and ecological communities; or facilitate educational activities and scientific research.	National parks conserve spacious areas containing unique or outstanding natural phenomena. Nature reserves are areas of special scientific interest containing wildlife or natural environments or natural phenomena.
Zoning	Zoning plan required. The Marine Park Regulation establishes sanctuary, habitat management, special use and general use zones.	Aquatic reserves can be zoned if required, subject to objectives.	No formal zone categories exist, apart from areas declared wilderness.
Management plans	An operations plan is required.	Management plans are optional, subject to the complexity of the reserve.	Plans of management are required.
Consultation - Reserve Establishment	The <i>Marine Parks Act</i> establishes an advisory council to advise the Authority on new park proposals.	Consent is required from the Minister responsible for the <i>Crown Lands Act</i> or authority/person in which the land is vested where a reserve is declared above mean high water mark. Below mean high water mark, there is no consent requirement for aquatic reserve declarations. (Ministerial advisory councils and committees are included in decisions on the declaration and management of aquatic reserves.)	Consent is required of the Minister for Fisheries for submerged lands not within the Eastern Division, and from any authority in which the land is vested. NPWS carries out a reserve referral process to Government agencies prior to reservation.
Consultation - Plans of Management (POMs)	Three month minimum formal public consultation required for zone plans and operational plans.	The Minister for Fisheries is required to consult the public on any proposed management plan. The draft plan must be exhibited for at least 30 days.	One month minimum formal public consultation required for national parks. The NPWAC has a statutory role in reviewing POMs. No public consultation is required for nature reserves, but is generally the same as national parks.
Activities	Multiple use. Marine Parks Authority can regulate activities in marine parks. Mining and mineral prospecting are prohibited. Aquaculture is permitted in general use zones only. Commercial activities require consent.	Allows for multiple use, however, generally they provide for high level protection and conservation only, with restrictions on fishing activities. The consent of the Director is required to undertake any prohibited activity. The <i>Offshore Minerals Act 1999</i> prohibits mining or exploration unless the written consent of the Minister for Fisheries is obtained.	Provide for public use, enjoyment, education and scientific research. Vehicles and vessels may be regulated. Fishing is permitted, but regulations prohibit use of spearguns, fish traps, spears and nets (other than handheld landing nets). Mining and mineral prospecting are prohibited. Other uses of the park must be consistent with the POM. Commercial activities require consent.

APPENDIX 5.

MARINE PROTECTED AREAS IN NSW AS AT MARCH 2001

RESERVE NAME	RESERVE TYPE	SIZE (ha) MARINE COMPONENT ONLY	BIOREGION	IUCN CATEGORY	MANAGEMENT RESPONSIBILITY
Ballina	Nature Reserve	26	TMN	Ia	NPWS
Ben Boyd	National Park	20	BAT	II	NPWS
Billinudgel	Nature Reserve	13	TMN	Ia	NPWS
Bongil Bongil	National Park	107	TMN	II	NPWS
Bouddi	National Park	253	HAW	II	NPWS
Broadwater	National Park	20	TMN	II	NPWS
Bundjalung	National Park	N/A	TMN	II	NPWS
Bushranger's Bay	Aquatic Reserve	3	BAT	I	NSW Fisheries
Clarence Estuary	Nature Reserve	0.3	TMN	Ia	NPWS
Cockle Bay	Nature Reserve	N/A	HAW	IV	NPWS
Comerong Island	Nature Reserve	260	TMN	IV	NPWS
Cook Island	Aquatic Reserve	12	TMN	II	NSW Fisheries
Coolongolook	Nature Reserve	N/A	MAN	Ia	NPWS
Corrie Island	Nature Reserve	19	MAN	Ia	NPWS
Crowdy Bay	National Park	1384	MAN	II	NPWS
Cudgen	Nature Reserve	176	TMN	II	NPWS
Cudmirrah	National Park	20	BAT	II	NPWS
Darawank	Nature Reserve	40	MAN	Ia	NPWS
Eurobodalla	National Park	N/A	BAT	II	NPWS
Fly Point – Halifax Park	Aquatic Reserve	75	MAN	II	NSW Fisheries
Georges River	National Park	N/A	HAW	V	NPWS
Hat Head	National Park	24	MAN	II	NPWS
Jagun	Nature Reserve	9	TMN	IV	NPWS
Jervis Bay	Marine Park	21,450	BAT	VI	MPA
Julian Rocks	Aquatic Reserve	80	TMN	II	NSW Fisheries
Karuah	Nature Reserve	129	MAN	II	NPWS
Khappinghat	Nature Reserve	131	MAN	II	NPWS
Kooragang	Nature Reserve	1,536	HAW	IV	NPWS
Ku-ring-gai Chase	National Park	540	HAW	II	NPWS
Lake Innes	Nature Reserve	1,150	MAN	Ia	NPWS
Lake Macquarie	State Recreation Area	N/A	HAW	N/A	NPWS
Lane Cove	National Park	222	HAW	V	NPWS
Limeburners Creek	Nature Reserve	103	MAN	II	NPWS
Long Reef	Aquatic Reserve	60	HAW	IV	NSW Fisheries
Lord Howe Island	Marine Park	48,000	NorFP-b	VI	MPA
Marramarra	National Park	N/A	HAW	II	NPWS
Munro Island	Nature Reserve	N/A	TMN	IV	NPWS
Muogamarra	Nature Reserve	45	HAW	Ia	NPWS
Myall Lakes	National Park	10,358	MAN	II	NPWS
Nadgee	Nature Reserve	106+	BAT	Ib	NPWS
North Sydney Harbour	Aquatic Reserve	250	HAW	VI	NSW Fisheries
Pelican Island	Nature Reserve	26	HAW	Ia	NPWS
Richmond River	Nature Reserve	139	TMN	Ia	NPWS
Rileys Island	Nature Reserve	10	HAW	Ia	NPWS
Royal	National Park	100	HAW	II	NPWS
Shiprock	Aquatic Reserve	2	HAW	I	NSW Fisheries
Solitary Islands	Marine Park	71,100	TMN	VI	MPA
Tilligerry	Nature Reserve	33	MAN	IV	NPWS
Towra Point	Aquatic Reserve	333	HAW	II	NSW Fisheries
Towra Point	Nature Reserve	127	HAW	IV	NPWS
Tweed Estuary	Nature Reserve	58	TMN	IV	NPWS
Tyagerah	Nature Reserve	20	TMN	Ia	NPWS
Ukerabagh	Nature Reserve	52	TMN	Ia	NPWS
Wooyung	Nature Reserve	22	TMN	IV	NPWS
Worimi	Nature Reserve	199	MAN	IV	NPWS
Yuraygir	National Park	169	TMN	II	NPWS

APPENDIX 6. NSW REPRESENTATIVE SYSTEM OF MARINE PROTECTED AREAS IDENTIFICATION AND SELECTION CRITERIA

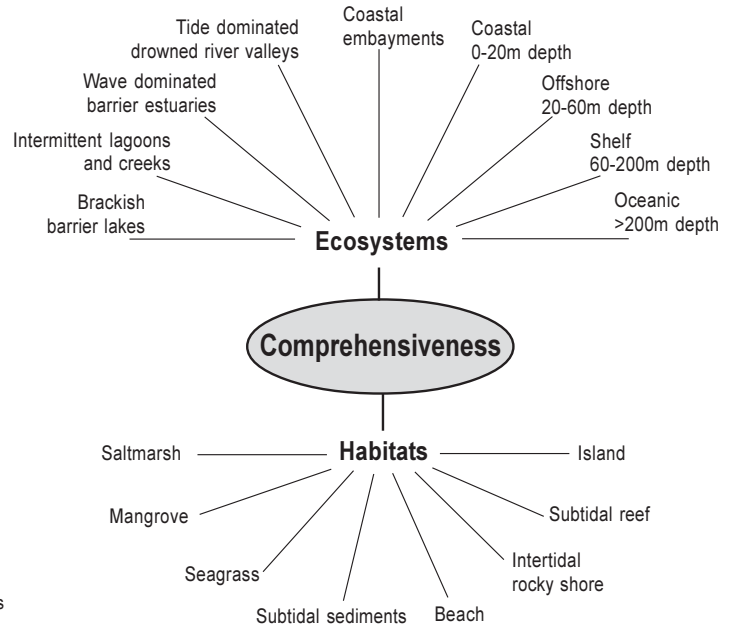


Figure 3: Criteria for Comprehensiveness

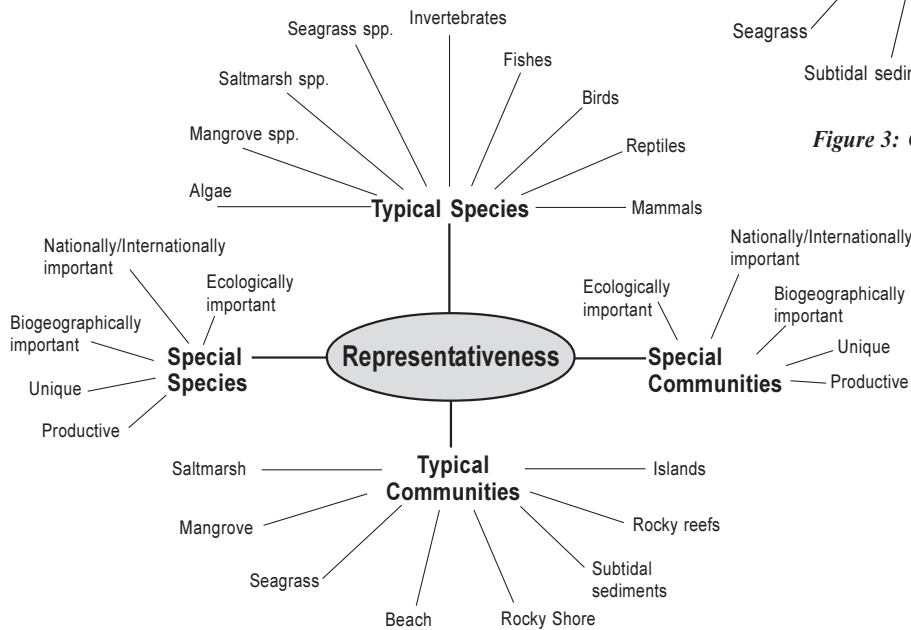


Figure 4: Criteria for Representativeness

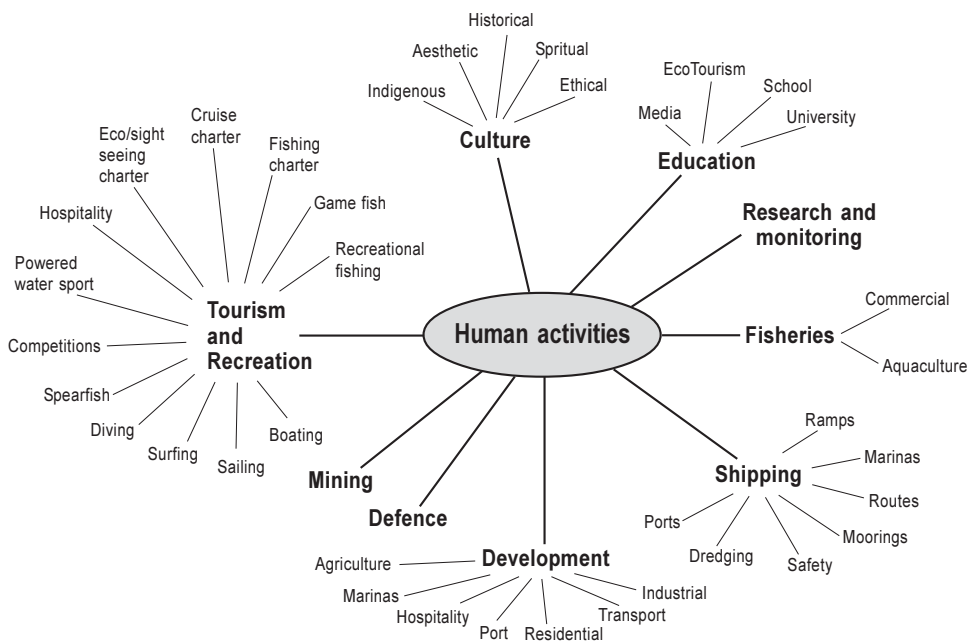


Figure 4: Criteria for Human Activities

Identification Criteria

The following criteria are considered in determining whether an area should be identified as a candidate marine protected area:

Comprehensiveness

- The extent to which the area contributes to conserving the full range of ecosystems and habitats within its bioregion.

Representativeness

- Representativeness requires that areas selected for reserves should reasonably reflect the range of biological diversity of communities within ecosystems and habitats. Ultimately, this criteria aims to represent all marine species found in NSW in the marine protected area network
- The degree to which the area adds to the NSW representative system of marine protected areas and National Representative System of Marine Protected Areas.

Naturalness

- The extent an area has been protected from, or has not been subjected to, human induced change.

Biogeographic Importance

- Either contains rare biogeographic qualities or is representative of an ecosystem
- Adds to coverage of the full range of ecosystems recognised at an appropriate scale within and across each bioregion.

Ecological Importance

- Important for maintaining Indigenous ecological knowledge
- Contributes to maintaining essential ecological processes or life-support systems
- Contains habitat for rare or endangered species
- Preserves genetic diversity, ie. is diverse or abundant in species
- Contains areas on which species or other systems depend, eg. contains nursery or juvenile areas or feeding, breeding or resting areas for migratory species
- Contains one or more areas that are biologically functional, self-sustaining ecological units (factors such as size, shape, connectivity and condition).

International or National Importance

- Is, or has the potential to be, listed on the World or a National Heritage list, Ramsar convention, declared a Biosphere Reserve or is subject to an international or national conservation agreement.

Uniqueness and Endemism

- Contains unique species, populations, communities or ecosystems
- Contains unique or unusual geographic features.

Ecological Productivity

- Species, populations, or communities with a high natural biological productivity.

Vulnerability

- Degree to which the area undergoes change due to natural processes
- Vulnerability and susceptibility to human-induced changes and threatening processes.

Selection Criteria

The following criteria are considered in the selection of an area as a marine protected area.

Indigenous Interests

- The degree of significance of an area for traditional use or economic values
- The presence of cultural values
- The existence of rights and interests held under Native Title
- The importance of an area for maintaining Indigenous ecological knowledge.

Social Interests

- The existing or potential value to the local, national or international community because of heritage, historic, aesthetic, educational or recreational qualities.

Economic Interests

- Existing or potential contribution to economic value, including employment, by virtue of its protection, eg. for recreation or tourism, or as a refuge or nursery area or source of supply for economically important species
- The current or potential use or extraction of resources
- Use by traditional custodians.

Scientific Interests

- Value for scientific research or monitoring.

Practicality/Feasibility

- Degree of insulation from adverse external influences
- Social and political acceptability; degree of community support
- Accessibility for recreation, tourism, education
- Compatibility with existing uses; ease of management; compatibility with existing management regimes.

Vulnerability

- Vulnerable or susceptible to human-induced changes and threatening processes.

Replication

- Ensuring that the geographic variation of ecosystems is conserved and therefore meets the criteria of representativeness
- Enhancing reserve and reserve system design by acting as insurance to decrease the likelihood that chance events, or human-induced change, will cause the ecosystem to decline. In this sense, it meets the criteria of adequacy.

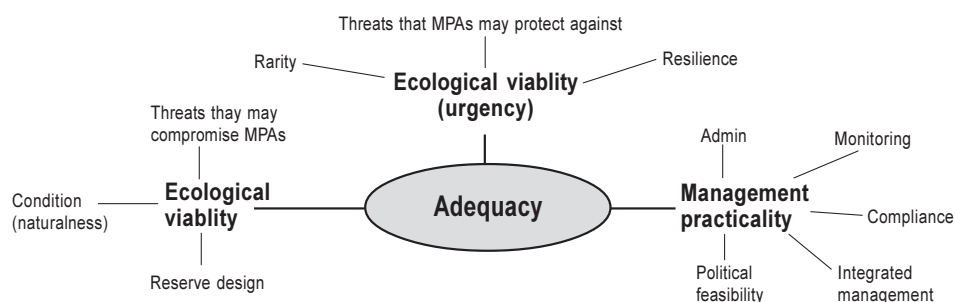


Figure 6: Criteria for Adequacy

APPENDIX 7.

PRINCIPAL STEPS FOR THE IDENTIFICATION OF CANDIDATE MARINE PROTECTED AREAS*

Step 1: Gathering Ecological Baseline Data and Developing Habitat Maps

The mapping of marine habitats is a critical requirement in the identification and selection of marine protected areas habitat. It requires a range of ecological data that defines the distribution of biodiversity, ecological processes and species populations within each bioregion.

Whenever possible, habitats will be mapped at a consistent resolution and accuracy across each bioregion to allow a comparative assessment. It is also desirable to map habitats consistently between regions. Mapping for Site Assessments will be carried out at site-specific scales and would depend on available information and habitat complexities.

When possible, this step will identify and fill gaps in existing data. Procedures will be established to facilitate the storage and ongoing development of key data sets.

There will be opportunities for broader community involvement through community-based biodiversity surveys and the input of Indigenous ecological knowledge.

Step 2: Identify Conservation Values

The conservation value of ecosystems will be determined following the full consideration of a range of identification criteria (Appendix 6). These are based on the ANZECC criteria and will be adapted or refined for use in NSW. Criteria headings include: biogeographic importance and comprehensiveness; ecological importance; international and national importance; uniqueness; naturalness; and ecological productivity.

A clear process for determining conservation values, particularly for those ecological features which have been mapped, will be undertaken. This stage addresses State, national and international conservation commitments, such as Ramsar (wetlands of international significance) and threatened species.

Step 3: Identify the Vulnerability of Ecosystems and Species

The vulnerability of ecosystems to threatening processes will be used in conjunction with conservation values to determine priorities for conservation management. Ecosystems with the highest conservation values and greatest vulnerability to threatening processes will have the highest priority. The extent and nature of threatening processes will be identified and, when possible, mapped.

Step 4: Identify Gaps in the Representation of Ecosystems and Species Populations within each Bioregion

The distribution of marine ecosystems within the bioregion and the locations of existing marine protected areas will be mapped. An audit of ecosystems that are represented within the existing marine protected area system will reveal which are inadequately represented.

Step 5: Identify Candidate Marine Parks and Marine Protected Area Priorities

This final step in the identification process collates all the information in Steps 1-4 to identify the most appropriate sites for marine protected areas. A range of conservation issues must be considered at this point, including the conservation (including naturalness) value, vulnerability, current level of ecosystem representation and the overall conservation priority of potential sites.

APPENDIX 8.

MARINE PROTECTED AREA PLANNING INSTRUMENTS

The *Marine Parks Act* provides for two planning instruments for marine parks – zone plans and operational plans. Zone plans are regulatory mechanisms that set out size, shape and location within a marine park. They also define the allowable uses and associated operating requirements of all activities within each zone. Zone plans may include species lists, and allowable fishing methods.

Operational plans detail how a marine park will be managed and operated over five years. These plans provide a framework for work programs that meet the objectives of the marine park and include processes that link management, research and compliance.

Guidelines for Zoning in Marine Parks

The Marine Parks Authority has made the preparation of detailed zoning selection guidelines, procedures and criteria a priority. Identification and selection of zones within a Marine Park uses the same set of criteria for identifying and selecting marine protected areas, but at finer scales – for example, identification and mapping of habitats.

The purpose of the zoning guidelines is to:

- ensure that all objectives for the NSW marine parks are considered systematically when zoning
- provide uniformity to the decision making process of the Marine Park Authority
- allow an objective and transparent approach to the decision making process
- ensure that all relevant issues are considered in developing a zoning plan
- ensure that the zoning plans are as practical as possible in terms of implementation, compliance and enforcement.

* A separate process exists in selection (Chapter 4)

Zoning Guidelines are grouped into the following categories:

A. Guidelines for Conservation of Natural and Cultural Resources

When possible, zone plans should:

- be preceded by a comprehensive system of habitat mapping and, when possible, species mapping
- include representative samples of characteristic habitat types in protective zones
- include protective zoning for areas of international, national, regional or local significance for marine biota and habitat conservation
- include protective zoning for potentially threatened species
- include protective zoning where significant breeding and nursery habitats, or other aggregation sites can be identified
- incorporate adjacent habitats that are significant to life cycles of species or of recreational, commercial or conservation importance in spatially continuous protective zones
- determine zonings consistent with the spatial and temporal scales at which ecological processes operate within the marine park
- provide for adequate buffering of key habitats that are included within protective zones (buffers should be included within sanctuary zones, when practical)
- include highly productive habitats in protective zonings
- provide protective zoning for unique and/or rare natural features
- include protective zoning for areas of cultural and historical significance.

B. Guidelines for Sustainable Resource Use

When possible, zone plans should:

- consider their effect on the economy of the neighbouring communities and the State in general both for extractive activities and tourism/recreation opportunities
- provide suitable access to alternative areas for activities which have been excluded from an area due to zoning.

C. Guidelines for Manageability of Zones

When possible, zone plans should:

- include clearly defined goals and guidelines describing the rationale for the location and specification of activities within the zone
- limit complexity of zoning
- give priority to areas in which conservation values are more likely to be maintained over time (when there are choices for protective zoning between areas of equivalent conservation value)
- zone to protect the values for which the area was declared a marine park
- maintain consistency with management of areas adjacent to the marine park, particularly Commonwealth and State marine and terrestrial protected areas and historic shipwrecks
- use easily recognisable features to delineate borders of zones
- minimise the regulation of and interference in human activities, consistent with meeting the objectives of the *Marine Parks Act*

include high levels of protection for all areas of high ecological significance when no removal of natural resources is occurring.

APPENDIX 9.

ENVIRONMENTAL CLASSIFICATION FOR BROADSCALE MAPPING OF BIODIVERSITY INDICATORS

Level 1 Ecosystem indicators	Level 2 Habitat Indicators	Level 3 Community and Species Indicators
Brackish barrier lakes	Mangrove	
Intermittent lagoons and creeks	Seagrass	Mangrove, seagrass and saltmarsh associations
Wave dominated barrier estuaries	Saltmarsh	
Tide dominated drowned valleys	Subtidal sediments	Mud, sand, gravel, rock
Coastal embayments	Beach	Intermediate, reflective and dissipative beaches
Coastal 0 – 20m depth	Intertidal rocky shore	Rock platforms, boulders, cobbles, pools and crevices
Offshore 20 – 60m depth	Subtidal reef	Barrens, kelp, coral
Shelf 60 – 200m depth	Islands and seamounts	Inshore and offshore reefs and islands
Oceanic > 200m depth		Specific communities and species