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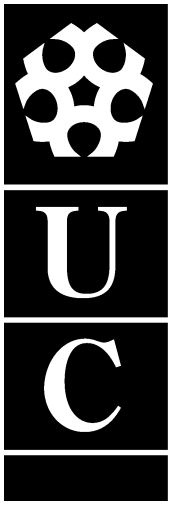

Project No. 1999/163

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*** Applied Ecology Research Group, School of Resource, Environmental & Heritage Sciences, University of Canberra, ACT 2601**
**** Department of Zoology and Entomology, University of Queensland, St Lucia, QLD 4072**

NON-TECHNICAL SUMMARY

1999/163	**A coordinated commercial fishing industry approach to the use of marine protected areas**

PRINCIPAL INVESTIGATOR

Professor Robert Kearney
Applied Ecology Research Group
School of Resource, Environmental and Heritage Sciences
University of Canberra ACT 2601
Telephone: 02 6201 5784 Fax: 02 6201 2328

OBJECTIVES

1. To assist national and State fishing industry bodies with the development of a positive response to government initiatives to increase the use of marine protected areas (MPAs) for conservation and management.

2. To compare the objectives and implementation strategies of the numerous government policies on marine resource use and conservation and prepare an assessment of their collective impacts on fishing industries.

3. To provide a concise and easily understood summary of the advantages and disadvantages to commercial fishers of present and proposed policies on MPAs.

4. To facilitate the development of a strategy to promote sustainable resource use as an objective of future use of MPAs.

5. To assist with the development of a nationwide fishing industry strategy to identify areas which could be included in future resource management by the use of MPAs.

6. To develop guidelines for industry involvement in monitoring the effectiveness of MPAs.

BACKGROUND AND NEED

Government agencies, NGO's and local and international conservation groups are increasingly advocating the use of Marine Protected Areas (MPAs) for the conservation and management of Australia's oceanic and estuarine resources. In December 1998, the Australian Commonwealth Government launched its Oceans

Policy, which included as a key component the acceleration of the establishment of a National Representative System of Marine Protected Areas (NRSMPA).

The implementation of MPAs is being superimposed on a variety of existing conservation and fisheries management initiatives. Not surprisingly, this creates uncertainty and apprehension among users of marine resources and particularly among fishers who are the most directly impacted by MPAs. In the main, MPA policies are being developed without due input from the fishing industry despite the significant potential impact of MPAs on fishers' access to marine resources. For issues as fundamental as access to fishing grounds, extensive and intensive consultation and debate are essential. Support from the fishing industry will be dependent upon clear and unambiguous answers to the many questions which currently cloud understanding of the efficacy of using MPAs as resource conservation and allocation tools.

For industry to effectively and appropriately respond to a new national initiative such as the development of the NRSMPA requires a national approach. However, State, Territory and national peak industry bodies do not always have the required resources and expertise to develop a national approach. One of the major aims of the project was to assist industry in developing a nation-wide uniform understanding of, and consistent response to, the principles and tools used in developing MPAs in order to promote its participation in the process. This requires first identification and acknowledgement of industry's needs and concerns.

This project has arisen directly from the initiative of State and national commercial industry peak bodies and has been designed to specifically assess policy impacts on commercial industries. Thus, at this stage, the project focuses on the commercial fishing industry.

GOVERNMENTS' PRINCIPLES AND PROCESSES IN ESTABLISHING MPAs

According to Commonwealth government documents (summarised in chapter 5), the declaration of MPAs in Australia is to follow a structured process aimed at developing regional and national networks of MPAs. This structured process is drawn from experience with the terrestrial environment and attempts to address inadequacies of the previous *ad hoc* approach to the implementation of MPAs. It involves a systematic approach based on three key components: bioregionalisation of the marine environment, establishment of nationally agreed principles and guidelines, and development of computer-based techniques for the identification and selection of MPAs.

The stated primary goal of the NRSMPA is to establish and manage a *comprehensive*, *adequate* and *representative* system of multiple-use MPAs to protect Australia's biodiversity. The implementation of MPAs involves two broad stages: the identification of candidate areas for reservation, followed by the selection of MPAs from these candidate areas. The identification of candidate areas is essentially concerned with natural processes, while the selection phase is more related to human processes and scientific interests.

The review and analysis of MPA planning processes established by Australian Governments (chapter 6) highlight the differences between each jurisdiction's biological, administrative and political circumstances, and thus their varying contribution to the development of the NRSMPA. The key features (ie. policies, legislation and operational framework) of governments' approaches to developing MPAs are compared between jurisdictions in Table 1. Each jurisdiction represents a case study on a particular theme, from which industry groups in other jurisdictions can learn. For example, Western Australia and Victoria are two extreme cases showing the impact of adequate, and inadequate, legislation on MPA development. Queensland demonstrates the difficulties in integrating fisheries management and conservation, while the Northern Territory seems to have reached some resolution on these issues. New South Wales illustrates one government's approach to multiple-use conflict resolution between commercial and recreational fishers. Tasmania is influenced by being used as a reference on MPA monitoring, and in South Australia the MPA process stalled for several months waiting for the Government to make a decision on compensation issues. Finally, the Commonwealth is the driving force in the accelerated establishment of MPAs in Australia, particularly exercising its financial and political influence on south-east States, where the first Regional Marine Plan is being developed under the Oceans Policy.

MPAs AS TOOLS FOR BIODIVERSITY CONSERVATION AND/OR FISHERIES MANAGEMENT

There is confusion in Australia on the role of MPAs for biodiversity conservation and fisheries management and this is one of the issues that generate most difficulties in the MPA debate between conservation agencies, the commercial fishing industry and the community.

The Bureau of Rural Sciences and CSIRO undertook an extensive review of the scientific literature on the effectiveness of no-take marine reserves for fisheries management (Ward *et al*. 2001). The review, the findings of which are summarised in chapter 7, is the first of its kind in Australia and helps dispel some scientific myths

and further the MPA debate. The implementation of no-take reserves is increasingly seen world-wide as a precautionary, ecosystem-based approach to address the problems currently faced by fisheries. However, the BRS-CSIRO review clearly shows that potential fisheries benefits are mostly theoretical and have not been demonstrated in practice. Fisheries benefits described in many studies on marine reserves are mostly observed for fisheries already over-exploited and/or under little or inappropriate management, as is the case of many small-scale tropical fisheries in developing countries.

Generally speaking, fisheries management in Australia is evolving from a system of input-based controls (eg. gear control, spatial management) to increased use of output-based control (eg. catch and/or fishing time quota allocations). This is supported by the implementation of other mechanisms, such as co-management and partnership approaches, allocation of fishing rights, and cost recovery of research and management. The granting of fishing rights is viewed as a means to provide fishers and financial institutions with greater security of access to resources, and thus to promote financial investment and development, while also promoting long term stewardship of the resources.

However, fisheries management and biodiversity conservation are poorly integrated in Australia (chapter 7). As a result, the impacts of MPAs on commercial fisheries and their management are poorly understood. This in turn influences the fishing industry's attitude to the implementation of MPAs. There is a need for discussion and consultation on this issue and a need for government fisheries agencies to enter the MPA debate more actively.

The current selection and design of MPAs are strongly driven by the reliance on geophysical ecosystem surrogates and an overly simplified use of the precautionary principle, demonstrating a level of complacency and unjustified optimism about the value of MPAs as a management tool (chapter 8). MPAs are being promoted as a protection against fisheries management failure, but their effectiveness as a natural resource management strategy is not being assessed (MPAs tend to be seen as outcomes rather than tools).

THE COMMERCIAL FISHING INDUSTRY'S CONCERNS WITH MPAs

Industry's concerns with the objectives of MPAs, their design, effectiveness and management are reviewed and analysed in detail in chapter 9. Most of industry's current resistance to MPAs is created by the lack of proper recognition and consideration by governments of the potential negative impacts of MPAs on commercial fisheries. The combination of loss of access to fishing grounds, poor

planning and poor consultation, mixed and confusing messages on whether or not MPAs achieve their objectives, and lack of government commitment to monitoring and enforcement, gives fishers little confidence in the value of MPAs.

TOWARDS A COMMERCIAL FISHING INDUSTRY COORDINATED RESPONSE TO MPAs

Industry's ability to develop a consistent approach to MPAs throughout Australia has been hampered by confusion within Commonwealth and State governments over the objectives of MPAs, coupled with a lack of definition of who has responsibilities for the impacts, positive and negative, they may have on fisheries. The assessment of the impacts of MPAs on commercial (and recreational) fisheries, and the management of these impacts, is the responsibility of State and Commonwealth fisheries agencies, but to date these agencies have shown limited engagement with the development of MPAs. Governments have not provided research and assessment of the fisheries implications of MPAs, which would underpin guidance and advice to industry and provide a focus for debate. In all jurisdictions, this situation has created an imbalance within governments between the needs for environmental conservation using MPAs and the needs for sustainable use of fish resources. This project has identified these deficiencies and initiated discussion within the Commonwealth government on committing extra resources to address them. At the same time the project has identified issues with which the industry must show more initiative. Guiding principles and a check-list of critical issues are presented in chapter 10 to assist the commercial fishing industry in developing a coordinated national response to MPAs. These principles and critical issues address both deficiencies in government processes and issues where industry has responsibilities.

KEYWORDS: marine protected areas, commercial fisheries, government policies, industry response.

LIST OF ACRONYMS

AFMA	Australian Fisheries Management Authority
AMCS	Australian Marine Conservation Society
ANZECC	Australian and New Zealand Environment and Conservation Council
ASIC	Australian Seafood Industry Council
BRS	Bureau of Rural Sciences
CALM	Conservation and Land Management
CAPAD	Collaborative Australian Protected Area Database
ComPAC	Commonwealth Protected Area Committee
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DEH	Department of Environment and Heritage
DELM	Department of Environment and Land
DPIF	Department of Primary Industry and Fisheries
DPIWE	Department of Primary Industry, Water and Environment
EA	Environment Australia
ECC	Environment Conservation Council
EPA	Environment Protection Agency
EPBC Act	Environment Protection and Biodiversity Conservation Act
ESD	Ecologically Sustainable Development
FRDC	Fisheries Research and Development Corporation
GBR	Great Barrier Reef
GBRMPA	Great Barrier Reef Marine Park Authority
GIS	Geographical Information System
IMBRENT	Interim Marine Biophysical Regionalisation for the Northern Territory
IMCRA	Interim Marine and Coastal Regionalisation
IUCN	International Union for the Conservation of Nature
LCC	Land Conservation Council
LMAC	Local Marine Advisory Committee
MFR	Marine Fisheries Reserves
MMIC	Marine and Marine Industries Council
MOU	Memorandum of Understanding
MPA	Marine Protected Area
MPRA	Marine Parks and Reserves Authority
NOI	Notice of Intent
NPWC	National Parks and Wildlife Conservation
NPWS	National Parks and Wildlife Service
NRE	Natural Resources and Environment (Department of), Victoria
NRSMPA	National Representative System of Marine Protected Areas

NSW SIC	New South Wales Seafood Industry Council
NTSC	Northern Territory Seafood Council
PIRSA	Primary Industries and Resources South Australia
PPP	Public Participation Program
PWCNT	Parks and Wildlife Commission of the Northern Territory
QPWS	Queensland Parks and Wildlife Service
QSIA	Queensland Seafood Industry Association
RAC	Reef Advisory Committee
RAP	Representative Area Programme
RFA	Recreational Fishing Area
RPDC	Resource Planning and Development Commission
SAFIC	South Australian Fishing Industry Council
SARC	Scrutiny of Acts and Regulations Committees (Victoria)
SARDI	South Australian Research and Development Institute
SCFA	Standing Committee on Fisheries and Aquaculture
SIV	Seafood Industry Victoria
SLOSS	Single Large Or Several Small (reserves)
SoE	State of the Environment
TAFI	Tasmanian Aquaculture and Fisheries Institute
TFIC	Tasmanian Fishing Industry Council
TFMPA	Task Force on Marine Protected Areas
UNCLOS	United Nations Convention on the Law of the Sea
UNEP	United Nations Environment Program
WAFIC	Western Australia Fishing Industry Council
WHA	World Heritage Area

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The project was funded by the Fisheries Research and Development Corporation (FRDC 1999/163), to which revenue is provided by the Commonwealth Government and the commercial fishing industry.

CONTENTS

Notes:

* Boxes indicate parts of the report that are summaries of other published reports.

** Headings used are those of the BRS-CSIRO report.

1 BACKGROUND

Government agencies, NGO's and local and international conservation groups are increasingly advocating the use of Marine Protected Areas (MPAs) for the conservation and management of Australia's oceanic and estuarine resources. In December 1998, at the close of the International Year of the Oceans, the Australian Commonwealth Government launched its Oceans Policy (Commonwealth Government 1998), in which it states its commitment to an integrated and ecosystem-based approach to the planning and management of the multiple-uses of Australia's oceans.

At the core of the Oceans Policy is the development of Regional Marine Plans, which will be based on large marine ecosystems and will integrate sectoral commercial interests and conservation requirements. The policy describes the goals of Regional Marine Plans as follows (Commonwealth Government 1998):

- to determine conservation requirements for each marine region, including the establishment of marine protected areas;
- prevention of potential conflict between sectors (commercial, recreational, charter) in relation to resource allocation; and
- provision of long-term security for all ocean users.

The South-East Regional Plan, which includes waters off Victoria, Tasmania, southern New South Wales and eastern South Australia, is the first plan currently under development.

The establishment of a National Representative System of Marine Protected Areas (NRSMPA) is one of the key components of the Oceans Policy. This had already been part of another programme, Ocean Rescue 2000, a 10-year long marine conservation programme launched by the Commonwealth Government in 1991. However, the development of MPAs has been slow and conducted in a rather *ad hoc* manner, often in response to public demand in specific locations (see McNeill 1994 for background information on the development of MPAs in Australia). The launch of the Oceans Policy signalled a clear intention from the Commonwealth Government to accelerate the development of the NRSMPA (Commonwealth Government 1998). The policy states that 'it is essential that the NRSMPA be established as quickly as possible both for conservation purposes and to give regional security for industry access to ocean resources.'

The implementation of MPAs is being superimposed on a variety of existing conservation and fisheries management initiatives. Not surprisingly, this creates uncertainty and apprehension among users of marine resources and particularly among fishers who are recognised as most directly impacted by MPAs (Hall 1999).

The commercial fishing industry has a gross value exceeding two billion dollars annually. It is also the primary provider of local seafood to the Australian public. The Australian Seafood Industry Council (ASIC) first initiated a debate on MPA issues in 1998 by developing a fishing industry policy on the development of MPAs (see Appendix 10 for details). The purpose of this policy was to promote a national approach to the implementation of MPAs by the fishing industry. However, peak industry bodies across Australia have not had the opportunity to fully evaluate the numerous implications of the increased use of MPAs. Rank and file fishers have had even less opportunity to obtain a full understanding of the issues and to appraise the benefits and costs of MPAs.

It is also apparent from government documents relating to marine resource conservation and management, and from the published literature on the pros and cons of MPAs, that fishers are not alone in their uncertainty. The Bureau of Resource Sciences and CSIRO have responded to the need for a thorough review of the attributes of MPAs in fisheries conservation and management by undertaking a major analysis of the available literature and current scientific opinion (Ward *et al*. 2001). This study is of particular relevance to the present project and a summary of the BRS-CSIRO report is presented in chapter 7.

2 NEED

MPAs are most likely to impact existing resource access regimes. In the main, MPA policies are being developed by groups of professionals working for months or years with the support of considerable government infrastructure. These policies tend to be prepared without due input from the group most effected, the fishing industry.

The industry will of course respond most positively to conservation proposals that lead to greater certainty for healthy and prosperous fisheries resources. But, to do so, all levels of industry need to understand the principles of these proposals and be convinced of the merit of the logic which underpins them. For issues as fundamental as access to fishing grounds, extensive and intensive consultation and debate must be anticipated. For peak bodies to coordinate the compliance and support necessary for the cost-effective implementation of new management strategies the great majority of fishers must back the initiatives. For a new national initiative such as the development of the NRSMPA, industry must be coordinated nationally.

Support from the fishing industry will be dependent upon clear and unambiguous answers to the many questions which currently cloud understanding of the efficacy of using MPAs as resource conservation and allocation tools. Some of the questions refer, for example, to the role of MPAs in catchment-based management, the impact of the implementation of MPAs on fisheries management systems, the role and input from the fishing industry, etc.

Issues of sustainable resource use and resource access are fundamental to the fishing industry and require a national approach. However, State-Territory and national peak industry bodies do not all have permanent staff with training and expertise to respond immediately and appropriately to increasing government conservation initiatives that affect fishing activities. This hampers the development of an industry national approach. To promote industry's participation in the development of MPAs, it is necessary to first identify and acknowledge its needs and concerns. This will also assist industry in developing a nation-wide uniform understanding of, and consistent response to, the principles and tools used in developing MPAs.

Access to marine resources is of fundamental concern to both commercial and recreational users of these resources; the principles of restricted access to areas as a conservation or management tool are relevant to both groups. This common interest is acknowledged. However, this project has arisen directly from the initiative of State and national commercial industry peak bodies and has been designed to specifically

assess policy impacts on commercial industries. Thus, at this stage, the project focuses on the commercial fishing industry.

3 OBJECTIVES

The objectives of the project were as follows:

1. To assist national and State fishing industry bodies with the development of a positive response to government initiatives to increase the use of marine protected areas (MPAs) for conservation and management.

2. To compare the objectives and implementation strategies of the numerous government policies on marine resource use and conservation and prepare an assessment of their collective impacts on fishing industries.

3. To provide a concise and easily understood summary of the advantages and disadvantages to commercial fishers of present and proposed policies on MPAs.

4. To facilitate the development of a strategy to promote sustainable resource use as an objective of future use of MPAs.

5. To assist with the development of a nationwide fishing industry strategy to identify areas which could be included in future resource management by the use of MPAs.

6. To develop guidelines for industry involvement in monitoring the effectiveness of MPAs.

4 METHODS

This project involved extensive compilation, review and analysis of information, with a focus on:

- description and comparison of government policies on MPAs and planning processes between Australian jurisdictions;
- review of the concepts and principles underlying the development of MPAs and the NRSMPA;
- current scientific opinion in Australia and overseas on the use and value of MPAs, with particular regards to the benefits and impacts of MPAs on commercial fisheries; and
- review and in-depth analysis of industry's views and concerns.

The information was gathered through review of Australian and international literature, searching the internet, and through extensive consultation with government, and some non-government, organisations and representatives of the commercial fishing industry. A round of 'state visits' and in-depth, face-to-face interviews was conducted in the first year of the project (see Appendix 1 for the list of agencies and organisations visited).

A detailed review of the scientific literature on marine reserves was outside the scope of this study. However, as mentioned earlier, the report of the extensive review of the role of marine reserves as fisheries management tools, which was recently completed by the Bureau of Rural Sciences and CSIRO (Ward *et al*. 2001), is summarised in this report (in chapter 7).

In the early stages of the project, two meetings were organised (28 April 2000 and 21 June 2000) with representatives of the commercial fishing industry peak bodies, including:

- Australian Seafood Industry Council (ASIC, the national peak body);
- Western Australia Fishing Industry Council (WAFIC);
- South Australian Fishing Industry Council (SAFIC);
- Seafood Industry Victoria (SIV);
- Tasmanian Fishing Industry Council (TFIC);
- New South Wales Seafood Industry Council (NSW SIC, initially represented by Ocean Watch);
- Queensland Seafood Industry Association (QSIA); and
- Northern Territory Seafood Council (NTSC).

The aims of the meetings were to introduce the project to the fishing industry representatives and discuss their major concerns with the current development of MPAs. Then, to assist them in developing a uniform understanding of MPA-related issues and in building a coordinated industry response to the use of MPAs, the project investigators produced three successive draft documents (in August 2000, December 2000 and July 2001), each further reviewing and analysing industry's concerns. Industry representatives were asked, individually, to provide comments on each document to ensure that their specific concerns were properly taken into account. This iterative approach was used to identify and highlight the commonality, across Australia, of industry's concerns with MPAs.

5 THE NATIONAL REPRESENTATIVE SYSTEM OF MARINE PROTECTED AREAS (NRSMPA)

5.1 INTERNATIONAL AND NATIONAL CONTEXTS

There is growing concern worldwide among government and non-government conservation organisations that the marine environment, and especially the coastal zone, is not adequately protected from the impacts of human activities (Crosby *et al.* 2000). In the past two decades, there has been an intensification of international environmental consciousness translated into international agreements and laws such as the United Nations Convention on the Law of the Sea (UNCLOS) and the Convention on Biological Diversity, to which Australia is a signatory (Tsamenyi and McIlgorm 1999b). The Convention on Biological Diversity and the International Union for the Conservation of Nature (IUCN) promote the establishment of a global representative system of marine protected areas (IUCN 1994). Besides Australia, other countries, such as the USA, Canada and New Zealand, are developing national networks of marine protected areas (NRC 1999, Parks Canada 1999, DOC 2000, NOAA 2001).

The IUCN definition for protected areas[1], which applies to both terrestrial and marine areas and which has been adopted by Australia, is:

'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 classification of protected areas is the most widely used internationally and is also used in Australia (appendices 3 and 4). This classification system ranges from strict preservation (category I, 'no-take' areas) to sustainable use of ecosystems (category VI).

Within Australia, the Federal Government also has obligations to meet the requirements of several policies, including:

[1] Australian government agencies use a variety of terms to define protected areas, eg. Marine Protected Areas, Marine Parks, Marine Reserves, Marine National Parks, Aquatic Reserves, Fish Sanctuaries, etc (Appendix 2). These protected areas have different levels of protection and different management regimes depending partly on the legislation used to declare them. Government agencies tend to use the term Marine Protected Areas (MPAs) to refer to multiple-use areas declared primarily for conservation purposes under conservation legislation. MPAs are distinguished from fisheries closures, often referred to as Fish Habitat Areas, which are usually declared primarily for fisheries management purposes under fisheries legislation. Members of the fishing industry tend to use the

- The National Strategy for Ecologically Sustainable Development (Commonwealth Government 1992);
- The Inter-governmental Agreement on the Environment (Commonwealth Government 1992); and
- The National Strategy for the Conservation of Australia's Biological Diversity (Commonwealth Government 1996).

The Inter-governmental Agreement on the Environment commits Commonwealth, State, Territory and local governments to a cooperative and integrated approach to managing the environment. It states that:

" The parties agree that a representative system of protected areas encompassing terrestrial, freshwater, estuarine and marine environments is a significant component in maintaining ecological processes and systems. It also provides a valuable basis for environment education and environmental monitoring. Such a system will be enhanced by the development and application where appropriate of nationally consistent principles for management of reserves."

The Commonwealth Government developed the Oceans Policy to meet Australia's international and national obligations (Commonwealth Government 1998).

5.2 THE NATIONAL GUIDELINES

Since the launch of the Oceans Policy, the declaration of MPAs in Australia is to follow a structured process aimed at developing State and national networks of MPAs. This structured process is drawn from experience with the terrestrial environment and attempts to address inadequacies of the previous *ad hoc* approach to the implementation of MPAs. The term *ad hoc* refers to decisions that lack proper perspective (the 'hot-spots' problem) or are intended simply to increase the number of reserved hectares regardless of conservation priorities in a region (Pressey and McNeill 1996, Ray 1997, Pressey 1999).

A systematic approach includes the following key components:

- bioregionalisation of the marine environment;
- establishment of nationally agreed guidelines and principles for the identification and selection of MPAs; and

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term 'MPAs' when in fact referring to 'no-take' areas. In this report the term MPAs is used according to the IUCN (and NRSMPA) definition, that is it refers to multiple-use marine protected areas.

- development of tools allowing computer-based identification and selection of MPAs.

As part of the policy, the Commonwealth is currently providing funding assistance to Commonwealth and State-Territory agencies in order to (Commonwealth Government 1998):

- accelerate the declaration and management of MPAs in Commonwealth waters (including five potential new marine parks already listed in the policy);
- refine tools for identification and selection of MPAs;
- develop partnership with key stakeholders to assist the implementation of the NRSMPA; and
- develop performance measures for the NRSMPA.

The Commonwealth Government acknowledges that the successful implementation of the Oceans Policy relies on effective collaboration between States-Territory and the Commonwealth. The Australian and New Zealand Environment and Conservation Council (ANZECC) is being used as the primary vehicle to facilitate this collaboration. A suite of documents has been released to guide State, Territory and Commonwealth conservation agencies in developing their systems of MPAs as part of the NRSMPA. Three of them are particularly important and are summarised below:

- Interim Marine and Coastal Regionalisation for Australia (IMCRA Technical Group 1998);
- Guidelines for Establishing the National Representative System of Marine Protected Areas (ANZECC TFMPA 1998); this document will be referred to as the 'national guidelines' or the 'guidelines'; and
- Strategic Plan of Action for the National Representative System of Marine Protected Areas: A guide for Action by Australian Governments (ANZECC TFMPA 1999).

These summaries are included here to facilitate the commercial fishing industry's wider access to government documents and further its understanding of the principles used by governments in developing the NRSMPA. They are not intended as formal reviews or analyses of the contents of the documents and they do not necessarily reflect the opinion of the authors of the present FRDC report. Comments on these government documents are made later in the report, as appropriate. More detailed information on the three documents is available on the Environment Australia website http://www.ea.gov.au**.**

5.2.1 Summary of "Interim Marine and Coastal Regionalisation for Australia" (IMCRA Technical Group 1998)

IMCRA is an ecosystem-based regionalisation of Australia's marine environment which extends to the 200m isobath and provides a biogeographic framework for the planning and management of the NRSMPA. It consists of a series of maps and descriptions that identify regions according to mostly physical characteristics, and some biological information when available. It was compiled by Environment Australia (EA) from information supplied by State, Territory and Commonwealth marine conservation and research agencies.

Two different scales were used: a regional scale, or meso-scale (distances are in 100s to 1000s kilometres) and a provincial scale (distances greater than 1000s kilometres). Sixty meso-scale regions (or bioregions) were identified in Australian waters (totalling 2.2 million square km). There are two categories of provinces: demersal provinces and pelagic provinces.

One of the major uses of IMCRA has been to conduct a gap analysis at the national level by comparing the distribution of bioregions and the distribution of existing MPAs (Cresswell and Thomas 1997). The IMCRA-based gap analysis showed that 92% of the total marine protected area is concentrated within 11 bioregions[2]. Of the 60 bioregions:

- 21 have no MPAs;
- 21 have MPAs covering less than 1% of their total area;
- 7 have MPAs covering 1 to 10% of their total area;
- 11 have MPAs covering 10 to 50% of their total areas (mainly off Queensland, the Great Australian Bight and the Western Australian coast).

Other MPAs exist outside IMCRA bioregions; they include portion of the Great Barrier Reef and MPAs within external territories.

As its name indicates, IMCRA is an interim regionalisation of Australia's marine environment and its authors stress that it is the responsibility of State, Territory and

[2] Additional information from Cresswell and Thomas (1997): as of 1997, over 43 million hectares (5%) of all Australia's waters (comprising States, Territory, external territories and Commonwealth waters) have been reserved in 148 MPAs (Appendix 2). About 99.5% of this total protected area is in tropical regions, with about 89% in the region of the Great Barrier Reef. Temperate and offshore areas are poorly represented. Most (84.3%) of the 148 MPAs have been declared in Commonwealth waters. MPAs declared in Western Australia and Queensland represent 93.9% in area of all MPAs declared in State and Territory jurisdictions.

Commonwealth marine management and research agencies to review and enhance the description of bioregions as more information becomes available[3].

5.2.2 Summary of "Guidelines for Establishing the National Representative System of Marine Protected Areas" (ANZECC TFMPA 1998)

The ANZECC Task Force on Marine Protected Areas prepared the national guidelines in order to assist government agencies in selecting MPAs in a more systematic and consistent manner across Australia. All States and Territory have endorsed these guidelines and each jurisdiction is now responsible for identifying and selecting multiple-use MPAs for addition to the NRSMPA.

Note that the summary below follows the structure of the ANZECC report and uses the same headings. The report also includes a glossary of terms, which is reproduced at the end of this chapter.

UNDERSTANDING THE NRSMPA

The guidelines state that the primary goal of the NRSMPA is to establish and manage a *comprehensive*, *adequate* and *representative*[4] system of MPAs to contribute to the long-term ecological viability of marine and estuarine systems, maintain ecological processes and systems, and protect Australia's biological diversity at all levels. Secondary goals include promoting integrated management of marine ecosystems, managing human activities, providing for the needs of species and ecological communities, and providing for the recreational, aesthetic, cultural and economic needs of indigenous and non-indigenous people, where these are compatible with the primary goal.

The NRSMPA consists of MPAs in Commonwealth, State and Territory waters and some associated intertidal areas. Some marine managed areas are not included in the NRSMPA, such as some indigenous protected areas, some areas established to protect fish habitats and some areas under cooperative management arrangements with industry.

The guidelines acknowledges that the lack of detailed knowledge on the marine

[3] The use of IMCRA bioregions tends to be controversial because of the limited data available to define bioregions. Most of Australia's inshore waters have still not been mapped. See chapter 6 for an example in Tasmania.
[4] The principles of comprehensiveness, adequacy and representativeness are often referred to the 'CAR' principles, which were originally developed for land-based protected areas.

environment makes it difficult to quantify the benefits that different forms of area management may achieve. The need to establish good baseline data for all managed marine areas and to develop performance indicators is recognised.

According to the guidelines, the key requirements for an MPA to be part of the NRSMPA, as compared to other marine managed areas, are:

- the MPA must have been established especially for the conservation of biodiversity (primary goal);
- it must be possible to classify the MPA into one of the six IUCN Protected Area Management Categories reflecting the values and objectives of the MPAs (see Appendix 3); the MPA may incorporate areas ranging from highly protected areas to sustainable multiple-use areas accommodating a wide spectrum of human activities;
- the MPA must have secure status which can only be revoked by a parliamentary process; and
- the MPA must contribute to the representativeness, comprehensiveness or adequacy of the national system.

The development of the NRSMPA is based on the following principles:

- **Regional framework**: IMCRA provides a national and regional planning framework for developing the NRSMPA. Ecosystems are used as the basis for determining representativeness;
- **Comprehensiveness**: the NRSMPA will include the full range of ecosystems identified in IMCRA;
- **Adequacy**: the NRSMPA will have the required level of reservation to ensure the ecological viability and integrity of populations, species and communities;
- **Representativeness**: those areas that are selected for inclusion in MPAs should reasonably reflect the biodiversity of the marine ecosystem they come from;
- **Highly protected areas**: the NRSMPA will aim to include some highly protected areas (IUCN Categories I and II, ie. no-take areas) in each bioregion;
- **Precautionary principle**: the absence of scientific certainty should not be a reason for postponing measures to establish MPAs;
- **Consultation**: the processes of identification and selection of MPAs will include effective and high-quality public consultation with appropriate community and interest groups, to address current and future social, economic and cultural issues;
- **Indigenous involvement**: the interests of Australia's indigenous people should be recognised and incorporated in decision making; and

- **Decision-making**: decision making processes should effectively integrate both long term and short term environmental, economic, social and equity considerations.

ESTABLISHING THE NRSMPA

The guidelines state that the classification and identification of areas must be driven by scientific information. However, when such information is not complete, it is recommended that MPAs should still be implemented using the best available information.

The implementation of MPAs involves two broad stages: the initial identification of candidate areas for reservation, followed by the selection of MPAs from these candidate areas. The identification of candidate areas is essentially concerned with natural processes, while the selection phase is more related to human processes (using social, cultural and economic criteria) and scientific interests.

The guidelines describe 9 steps involved in the identification and selection of individual MPAs:

1. gather baseline data including ecosystem mapping;
2. identify a list of candidate areas within IMCRA bioregions to represent major ecosystems. The identification process is essentially based on bio-geographic characteristics to assess the representativeness, comprehensiveness, ecological importance, international and national importance of ecosystems;
3. identify threatening processes;
4. identify gaps in the representation of ecosystems in existing MPAs within each IMCRA bioregion;
5. develop national and regional priorities;
6. develop additional criteria for the identification and selection if required;
7. select sites for MPAs using list of selection criteria including any criteria developed in Step 6;
8. assess feasibility of potential MPAs and negotiate new protected areas; and
9. establish MPAs and initiate management, including evaluation and review.

The criteria used to identify and select MPAs are derived from previous works by Kelleher and Kenchington (1991)[5] and Thackway (1996). The guidelines recommend using the following criteria to identify candidate areas:

- representativeness;

[5] The guidelines published by Kelleher and Kenchington in 1991 were reviewed and updated in 1999 (Kelleher 1999).

- comprehensiveness;
- ecological importance (eg. in maintaining ecosystem functions, in protecting rare or endangered species, etc);
- international or national importance (eg. on the world or a national heritage list);
- uniqueness;
- productivity (ie. high natural biological productivity);
- vulnerability assessment (ie. are the ecosystems and/or communities vulnerable to natural processes);
- biogeographic importance; and
- naturalness (ie. how much of the area has not been impacted by human activities).

During the selection phase, the 'least costs' principle is to be used, meaning that between two ecologically equivalent candidate areas, the one having the least socio-economic and cultural impact should be selected. It is mostly during the selection phase that community involvement and consultation is to take place. The criteria to be used for the selection of MPAs include:

- economic interests (eg. economic value of an area by virtue of its protection –for example for recreation- or from existing/potential exploitation of resources);
- indigenous interests;
- social interests (eg. heritage, cultural, educational values);
- scientific interests;
- practicality/feasibility (eg. insulation from existing threats, social and political acceptability, community support, access for recreation, tourism and education, compatibility between MPA declaration and existing uses, relative ease of management and compatibility with existing management regimes);
- vulnerability assessment (is the site vulnerable and susceptible to human induced changes and threatening process); and
- replication (replication of ecosystems within a bioregion).

The vulnerability criterion is used to prioritise areas at both the identification and selection stages. It relates to natural processes during the identification stage, and to human actions and threatening processes during the selection stage.

The guidelines stress that flexibility in the application of the above identification and selection criteria will be required due to the variety of legislative and management frameworks for the marine environment across Australia.

The establishment of the NRSMPA will also be guided by the development of national and regional priorities:

- the development of national priorities for establishing new MPAs is based on the assessment of gaps in the comprehensiveness of the NRSMPA using IMCRA and CAPAD (Collaborative Australian Protected Area Database, a database containing information on all protected areas in Australia, including their IUCN management categories. See www.ea.gov.au/parks for more information); Environment Australia coordinates the national gap analysis and national priorities are to be developed through cross-jurisdictional cooperation and agreement;
- the development of regional priorities is carried out by each State, Territory and Commonwealth jurisdiction. The process involves gap analyses as well as analysis of values, threatening processes, socio-economic considerations and other selection criteria.

The declaration of individual MPAs is the responsibility of the relevant State, Territory or Commonwealth jurisdiction. For each MPA, jurisdictions are responsible for:

- assessing relative ecological and socio-economic values;
- assessing threatening processes;
- identifying management objectives and intentions (ie. level of environmental protection attached to each zone within multiple-use MPAs); and
- consulting with stakeholders, including consideration of industry, displacement and compensation issues.

EVALUATING THE NRSMPA

The guidelines only state that the effectiveness of the NRSMPA will be monitored by the Commonwealth with assistance from States and Territory. They advise to refer to the Strategic Action Plan for the NRSMPA (ANZECC TFMPA 1999, see summary below) for information on monitoring and reporting processes.

5.2.3 Summary of "Strategic Plan of Action for the National Representative System of Marine Protected Areas: A Guide for Action by Australian Governments" (ANZECC TFMPA 1999)

The ANZECC Task Force on Marine Protected Areas (ANZECC TFMPA) prepared this document setting out the actions required to achieve the primary and secondary goals of the NRSMPA, as set out in the national guidelines summarised above. The plan has been endorsed by State, Territory and Commonwealth governments.

The ANZECC TFMPA identified 34 actions, which fall into 6 major categories:

1. **Establishing a comprehensive, adequate and representative system**: 5 actions dealing with determining how to assess comprehensiveness, adequacy and representativeness; definition of principles and application to ecosystem mapping, and gap analyses;
2. **Information requirements and management**: 15 actions dealing with ecosystem mapping, developing data collection standards, developing rapid assessment methodology, conducting threat analysis, harnessing community and industry knowledge;
3. **Involvement of stakeholders**: 3 actions dealing with analysing existing information programmes, developing a dialogue with stakeholders regarding ecological, socio-economic values, and strategic and political processes involved in the selection and declaration of MPAs;
4. **Classifying marine protected areas using IUCN Categories**: 4 actions dealing with applying the IUCN categories to the Australian context and developing nationally consistent nomenclature. The IUCN categories are not designed to drive the development of systems of MPAs and MPAs should be established to meet objectives consistent with national or regional goals and needs, and only then be assigned an IUCN category according to agreed management objectives;
5. **Managing the NRSMPA**: 4 actions dealing with reviewing joint management arrangements, developing strategies to enhance indigenous people's participation; developing models for industry's involvement in the monitoring and management of MPAs;
6. **Performance assessment**: 3 actions dealing with performance assessment of the NRSMPA at three spatial scales: individual MPA level, bioregion level and NRSMPA level. At the NRSMPA level, a report is to be produced on a nationally agreed set of performance indicators, drawing from all jurisdictions and coordinated by the ANZECC TFMPA. Each jurisdiction is to develop performance indicators at the individual MPA and bioregion levels that are consistent with the nationally agreed set of performance indicators.
   Performance indicators for the bioregional level will include:
   - the number of MPAs present in a bioregion;
   - the area covered by MPAs;
   - the IUCN protected area management categories;
   - the degree to which comprehensiveness, adequacy and representativeness have been achieved; and
   - the degree of effectiveness of cross-jurisdictional planning and management within bioregions.

The ANZECC TFMPA formed Action Groups in each jurisdiction to undertake the actions outlined in the guide. The timetable for completing the 34 actions spans from early 1999 to late 2001.[6] The ANZECC stressed that the success of the Plan of Action depends on the level of resources provided by the jurisdictions responsible for implementing the actions.

5.2.4 Glossary of Terms Referring to the NRSMPA (ANZECC TFMPA 1999)

Adequacy – The maintenance of the ecological viability and integrity of populations, species and communities.

Biodiversity (Biological diversity)[7] – The variability among living organisms from all sources, including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes the diversity within species, between species and of ecosystems (UNEP 1994).

Bioregion (Biogeographic region) – An area defined by a combination of biological, social and geographic criteria, rather than by geopolitical considerations. Generally, a system of related, interconnected ecosystems.

Comprehensiveness – Includes the full range of ecosystems recognised at an appropriate scale within and across each bioregion.

Community – A group of organisms, both animals and plants, living together in an ecologically related fashion in a defined area or habitat.

Ecologically sustainable development (ESD) – 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 – A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

[6] Information on the progress of these actions was not readily available at the time of writing this report.

[7] The National Strategy for the Conservation of Australia's Biological Diversity (Commonwealth Government 1996) gives a somewhat different definition of biodiversity: " the variety of all life forms – the different plants, animals, micro-organisms, the genes they contain, and the ecosystems of which they form a part. It is not static, but constantly changing, it is increased by genetic change and evolutionary processes and reduced by processes such as habitat degradation, population decline and extinction. The concept emphasises the inter-relatedness of the biological world. It covers the terrestrial, marine and other aquatic environments".

Ecosystem-based management – Management, usually of human activities and their effects, which seeks to identify and address direct and indirect effects on ecosystem components and to integrate planning and management activities across sectors within ecosystem-defined units or areas.

Exclusive Economic Zone (EEZ) – The area between the lines 12 nautical miles and 200 nautical miles seaward of the territorial sea baselines. In this area, Australia has the right to explore and exploit living and non-living resources, and the concomitant obligation to protect and conserve the marine environment.

Highly protected areas – IUCN Protected Area Management Categories I and II; also known as 'no take' areas.

Indicators – Physical, chemical, biological or socioeconomic measures that can be used to assess natural resources and environment quality, and that are fundamental to the SoE reporting process.

Interim Marine and Coastal Regionalisation for Australia (IMCRA) – An ecosystem-based classification for marine and coastal environments. It provides ecologically based regionalisations at the meso-scale (100 – 1000 km) and at a provincial scale (greater than 1000 km). IMCRA is the bioregional framework for the planning and management of the NRSMPA.

Multiple-use management – An approach that aims to achieve integration of an acceptable balance of outcomes across the full range of marine uses.

'No take' areas – IUCN Protected Area Management Categories I and II; referred to in text as highly protected areas.

Protected area / marine protected area (MPA) – 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.

Representativeness – Those marine areas that are selected for inclusion in reserves should reasonably reflect the biotic diversity of the marine ecosystems from which they derive.

6 REVIEW OF GOVERNMENT MPA PLANNING PROCESSES BY JURISDICTION

In Australia, government processes to implement MPAs vary significantly between jurisdictions, and so does each jurisdiction's contribution to the NRSMPA. This is partly a result of differences in environmental issues, impacts on marine industries, cross-jurisdictional relationships and regional political imperatives. Individual fisheries across Australia also have different structures and economic values, face different environmental problems and are managed under different management systems, all of which influence both governments and industry in their approach to the NRSMPA.

In this chapter, government MPA planning processes are reviewed for each jurisdiction based on the analysis of information collected from conservation and fisheries agencies and from the fishing industry. Only processes and events that are relevant to the present analysis of industry's concerns with MPAs are described. They are also described as they took place at the time of the study and no attempt is made to situate them within a wider historical and political context.

States and Territory conservation agencies across Australia have been under varying pressure (ie. through financial assistance) from the Commonwealth to develop systems of MPAs in their jurisdiction. For example, the Commonwealth Government has, so far, focussed its attention on the States of Victoria, Tasmania, New South Wales and South Australia as part of the development of the first Regional Plan off south-east Australia. This review will also show that each jurisdiction has its own set of circumstances and particularities regarding the establishment of MPAs, due to a variety of biological, administrative and political factors. Each jurisdiction represents a case study on a particular theme, from which industry groups in other jurisdictions can learn. For example, Western Australia and Victoria are two extreme cases showing the impact of adequate, and inadequate, legislation on MPA development. Queensland demonstrates the difficulties in integrating fisheries management and conservation, while the Northern Territory seems to have reached some resolution on these issues. New South Wales illustrates one government's approach to multiple-use conflict resolution between commercial and recreational fishers. Tasmania is influenced by having become an international known reference on MPA monitoring, and in South Australia, the MPA process stalled for many months, waiting for the Government to make a decision on compensation issues. Finally, the Commonwealth is the driving force in the accelerated establishment of MPAs in Australia, particularly

exercising its financial and political influence on south-east States, as part of the ongoing development of the first Regional Marine Plan.

By providing detailed descriptions of government MPA processes, the aim of this chapter is to facilitate comparison between Australian jurisdictions. Table 1 at the end of the chapter summarises, by jurisdiction, the key features of government MPA planning processes. This is to assist representatives of the commercial fishing industry in developing a collective response to MPAs by identifying areas of commonality, nationally, in their concerns with MPAs.

6.1 THE COMMONWEALTH MPA PLANNING PROCESS

Environment Australia (EA) plays two roles in the development of the NRSMPA:

- as a leading agency assisting States and Territory implement systems of MPAs in their jurisdiction through providing guidelines and short-term grant money; Commonwealth financial assistance has been primarily allocated to jurisdictions off south-east Australia, ie. South Australia, Victoria, Tasmania and New South Wales (where the first Regional Plan is being developed);
- as a contributor to the NRSMPA by developing a system of MPAs in Commonwealth waters.

6.1.1 The EPBC Act and MPAs

The Commonwealth Government is committed to developing a comprehensive, adequate and representative system of MPAs within its jurisdiction. Prior to July 1999, Commonwealth MPAs were established under the *National Parks and Wildlife Conservation Act 1975* (the NPWC Act). In July 2000, this act, along with 4 other Commonwealth acts, was replaced by the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Department of Environment and Heritage (DEH, also referred to as Environment Australia, EA) is the agency with statutory responsibility under the EPBC Act for declaring and managing MPAs in Commonwealth waters.

Besides MPAs, the EPBC Act also provides for the establishment of 'conservation zones', which are proclaimed by the Governor-General. This is to provide protection to areas under significant threats while they are being assessed for inclusion in MPAs. In late September 2001, the Federal Minister for DEH announced plans to assess 11 conservation zones in Australian waters (MPA News, October 2001). The main

purpose of the conservation assessment will be to advise the Government on whether to proceed with designating each of the sites as an MPA.

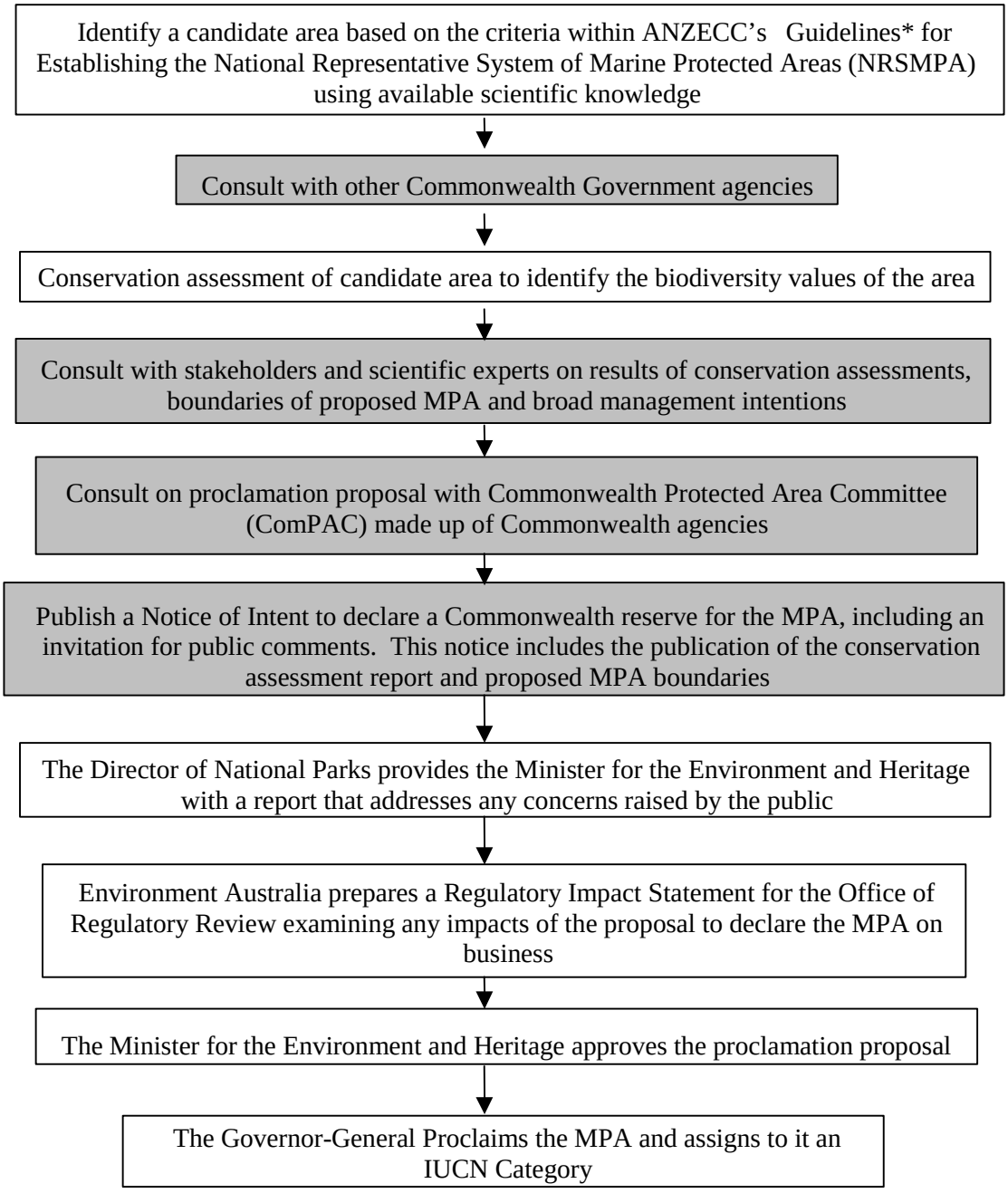
Management plans for Commonwealth reserves are prepared by the Director of National Parks and subject to the approval of the Minister for the Environment and Heritage before being tabled in both Houses of the Commonwealth Parliament. Under the EPBC Act, the functions of the Director include:

- administer, manage and control Commonwealth reserves and conservation zones;
- protect, conserve and manage biodiversity and heritage in Commonwealth reserves and conservation zones;
- co-operate with any country in matters relating to the establishment and management of national parks and nature reserves in that country;
- make recommendations to the Minister in relation to the establishment and management of Commonwealth reserves.

The process to establish an MPA in Commonwealth waters is set out in the EPBC Act. Under the Act, before a Commonwealth MPA is proclaimed, a report must be published, which includes a Notice of Intent (NOI) to declare the MPA and an invitation for public comments. An NOI must show the boundaries of the MPA, describe its purpose and assign the MPA, and its zones if applicable, to a particular IUCN category that affects how the MPA/zone is managed and used. MPAs that were previously proclaimed under the NPWC Act are now being assigned an IUCN category as part of their management plans prepared under the EPBC Act.

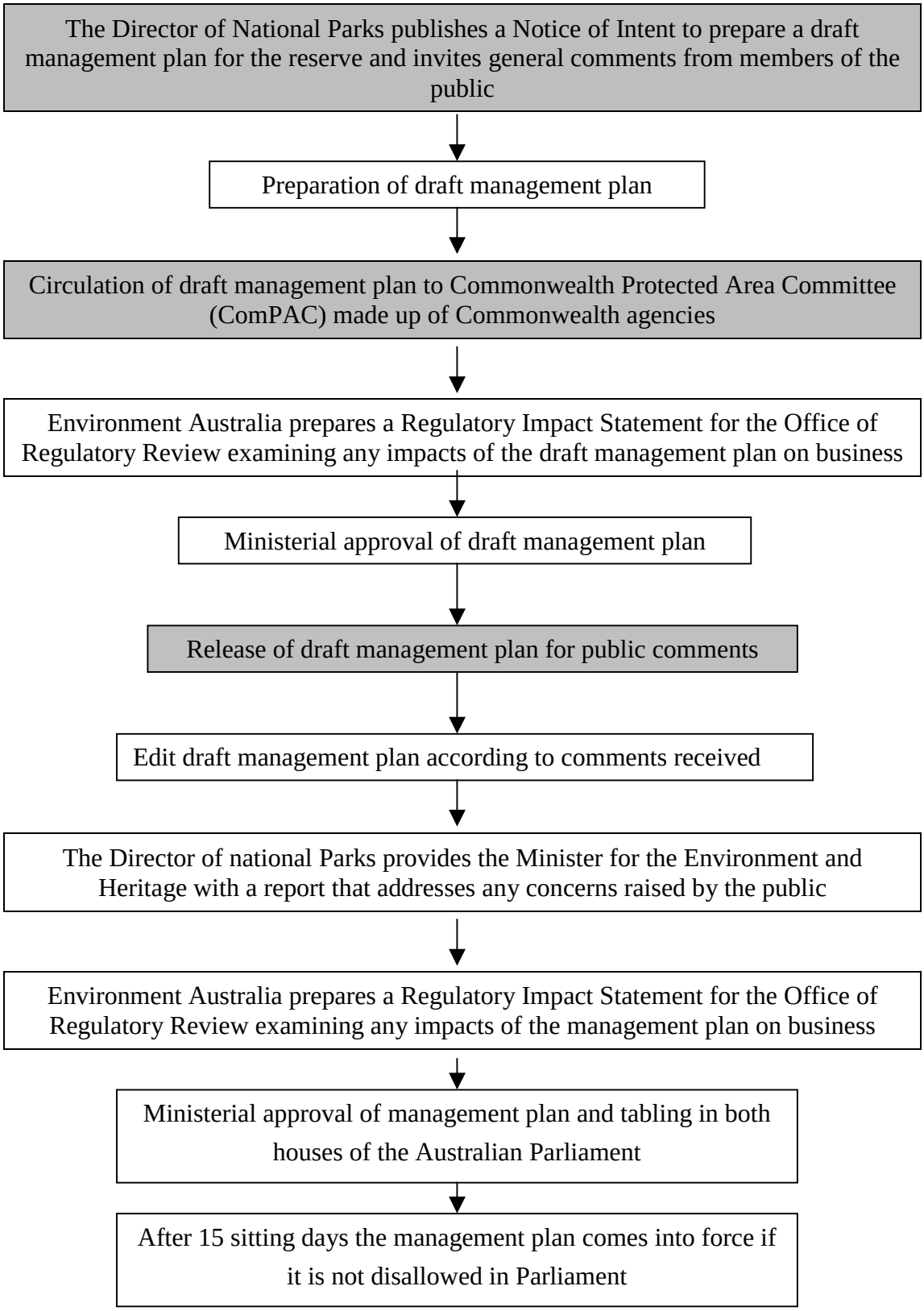
The flow-charts below outline the processes to proclaim a Commonwealth MPA and to prepare a management plan under the EPBC Act (these flow-charts were provided by EA in September 2001). In 1998, a Commonwealth Marine Protected Area Committee (ComPAC) representing various Commonwealth agencies was set up to advise EA on sectoral interests in relation to the implementation of Commonwealth MPAs. Little information is available to date on the functions and activities of this committee.

Commonwealth process to proclaim an MPA



* National guidelines described in chapter 5

Commonwealth process to prepare a management plan



(Outline provided by Environment Australia, September 2001 – grey background indicates points of consultation).

The Commonwealth has been very active in recent years, declaring several MPAs and developing several management plans. In 1998, the Great Australian Bight Marine Park was declared and the new Oceans Policy listed five more priority areas for conservation. Four of them have now been declared:

- The Macquarie Island Marine Park in 1999;
- The Tasmanian Seamount in 1999;
- The Lord Howe Island Marine Park in 2000; and
- The Cartier Island Marine Reserve in 2000.

The Heard Island and McDonald Islands Marine Reserve was the last on the list to be formally proposed in January 2001.

By the end of 2000, the Commonwealth also finalised management plans for the Great Australian Bight and the Mermaid Reef Marine National Nature Reserve, and released several draft management plans for public comments, including:

- Solitary Islands Marine Reserve;
- Macquarie Island Marine Park;
- Tasmanian Seamount Marine Reserve;
- Coringa-Herald National Nature Reserve and Lihou Reef National Nature Reserve; and
- The Ningaloo Marine Park.

Apart from references to the criteria set out in the national guidelines described in the previous chapter, there is little information available on how areas are identified and selected in practice. It is unclear how the CAR[8] criteria are used to identify areas within Commonwealth waters. EA acknowledges that the lack of clear definition of the objectives for MPAs hamper their implementation. To address this issue, EA is currently focussing on developing rapid assessment methodologies and performance indicators for each of the 12 Commonwealth marine parks already declared.

Under the EPBC Act, the assignment of an IUCN category appears to be a major factor in the development of Commonwealth MPAs. Each (Australian) IUCN category requires different management approaches and management plans must be consistent with the principles set out for each category in the EPBC Regulations 2000 (Commonwealth Government 2000, Schedule 8). Schedule 8 also describes the general administrative principles for the management of IUCN categories:

- community participation;

[8] See footnote 4.

- effective and adaptive management;
- precautionary principle;
- minimum impact;
- ecological sustainable use;
- transparency of decision-making; and
- joint management (in the case of the reserve being owned by Aboriginal communities).

In December 2000, EA invited a few scientific experts and industry representatives to an informal meeting as a first step in identifying new potential areas for reservation. Following from this meeting, EA developed a list and brief description of 27 potential areas (AFMA Environment Update 14). Most of the information considered was of a geological nature, with little biological or ecological information. From this list of potential areas, a subset of 27 areas was later selected by EA for further investigation.

The Commonwealth has also initiated collaboration with other countries to develop MPAs in the high seas (Commonwealth Government 2000, MPA News August 2001).

6.1.2 Interaction with commercial fisheries

Except for the Great Barrier Reef Marine Park in Queensland, Commonwealth MPAs have had relatively limited impact on the commercial fishing industry so far compared to the potential impact of those proposed in State coastal waters. The Australian Fisheries Management Authority (AFMA) is the statutory agency responsible for the management of Commonwealth fisheries and its Environment Section has engaged actively with EA and industry with regard to MPAs. The progress of MPA implementation in Commonwealth waters is regularly reported in the Environmental Section Update (available from AFMA Environmental Section).

It appears that AFMA and the commercial fishing industry were not consulted when the five priority areas for reservation were listed in the Oceans Policy, nor was AFMA invited to the December 2000 meeting mentioned above. At EA's request, AFMA is now providing comments on fisheries interests in the 27 areas under investigation.

The AFMA Environment Section sought comments from industry (through fisheries Management Advisory Committees) on the management plans that were developed over time by EA for each Commonwealth MPA. On several occasions, AFMA has expressed its concern at EA's lack of consultation in making changes to management plans (eg. Solitary Islands Marine Reserve, Environment Update 14).

Industry's major concerns with Commonwealth MPAs have been related to proposed banning of longline fishing (eg. Tasmanian Seamount Marine Reserve), the right for fishers to retrieve drifting longlines within MPAs (eg. the Great Australian Bight MPA, Ningaloo MPA), fishing permits in MPAs, inconsistency of zoning (and subsequent assignment of IUCN categories) between adjacent State and Commonwealth MPAs (eg. Ningaloo Marine Park).

The NRSMPA is normally to be developed, as far as possible, as part of the Regional Marine Planning process (ANZECC TFMPA 1999). However, there is little evidence to date of integration between the development of MPAs by EA and the South-East Regional Plan by the National Ocean Office.

6.2 WESTERN AUSTRALIAN MPA PLANNING PROCESS

By comparison to the States within the south-east region of Australia, Western Australia has not been under much pressure from the Commonwealth to develop MPAs as part of the NRSMPA. The Conservation and Land Management (CALM) State agency is selecting and establishing individual MPAs one at a time and was until recently focussing on the zoning of already declared MPAs (eg. Jurien Bay Marine Park).

The Western Australian MPA planning process is described in some detail below because it has recently been revised and tends to be regarded as a model by industry groups in other jurisdictions. The Jurien Bay Marine Park was the first MPA to be planned under the new planning process.

6.2.1 Background: difficult days

In the 1980s, the declaration of MPAs (eg. The Marmion and Ningaloo Marine Parks) under the *CALM Act 1984* was very contentious and protracted. The key issues for the commercial fishing industry were:

- lack of recognition in the CALM Act of the multiple-use principle for marine protected areas (marine conservation areas were to be reserved and declared exclusively for conservation and recreation; activities such as education, scientific research and commercial fishing were not catered for);
- lack of expertise in the marine environment and in fisheries issues from the State government conservation agency (when it was established in 1984, CALM was essentially concerned with land based conservation issues);

- unpopular selection of candidate areas by scientists. In 1994, the Government released a report, 'A Representative Marine Reserve System for Western Australia' (often referred to as the 'Wilson report') in which as many as 70 priority areas were identified for high level of protection along the Western Australian coast (Wilson 1994). It is unclear what proportion of the coast these candidates covered, but their high number created great uncertainty and discontent within the fishing industry.

6.2.2 New Government policy on MPAs: better days

In 1994, the Government of Western Australia published a policy document, the 'New Horizons in Marine Management', which was endorsed by CALM, Fisheries WA and The Mines, and which initiated a suite of changes and improvements in the planning process of MPAs. The policy was updated in 1998, 'New Horizons – the way ahead in marine conservation and management' (Western Australia Government 1998). In these documents, the Government commits itself to the conservation of the marine environment and to the principles of ecologically sustainable use of natural resources.

The objectives of the reserve system are described as follow:

- to preserve representative as well as special ecosystems in the marine environment; and
- to put a formal management framework in place to ensure the various uses of marine conservation reserves are managed in an equitable, integrated and sustainable manner.

Some of the key elements of the new government's marine conservation and management strategy are:

- Creation of a new Marine Parks and Reserves Authority (MPRA) in which the marine reserves are vested. Its primary role is to oversee and audit the planning and management of marine reserves and to advise the Minister for the Environment. It has seven members nominated by the Minister for the Environment and appointed by the Governor. Members are appointed for their expertise and do not represent sectoral interests.

- New classification system for marine reserves which explicitly recognises multiple-use needs.

- Creation of a Marine Branch at CALM with adequate staff and funding to build up marine expertise. CALM Marine Branch manages all MPAs vested in the Marine

Parks and Reserves Authority and is responsible for preparing and implementing management plans for each MPA. CALM responsibilities also include information and education in conservation and recreation, and liaison and facilitation with interest groups.

- Creation of a specialist Scientific Advisory Committee to advise the Minister for the Environment and the MPRA on proposed marine reserve types and boundaries. It has seven members comprised of marine scientists from the non-government sector, research institutions, CALM, the WA Museum and Fisheries WA.

- Revision of statutory consultation protocols. Before an MPA can be declared, the Minister for the Environment must release a Notice of Intent (NOI) for each MPA proposal, including not only proposed boundaries and reserve purpose, but also an Indicative Management Plan (IMP) and any proposed zoning. This is an important point for the commercial fishing industry. Industry socio-economic concerns are better taken into account when both the selection of areas and their zoning are negotiated simultaneously, and from the start of the planning process.

- In addition to statutory requirements, CALM also developed non-statutory stakeholders' participation procedures. This initiative from CALM has apparently greatly contributed to improving MPA negotiations.

- Requirement for a concurrence of agreement between the Ministers for the Environment, the Mines and Fisheries at several stages of the MPA planning process. The Minister for the Environment must obtain the consent of the Ministers for Fisheries and the Mines before creating any MPA or management zone within an MPA.

The *Acts Amendment (Marine Reserves) Act 1997* amended the CALM Act in November 1998 to integrate the Government's New Horizons policy. These amendments also confirmed that fishing activities within marine parks are to be regulated under the Fisheries Act. Under this new planning process, the relationship between Fisheries WA and CALM has also improved.

6.2.3 Legislation on compensation

The *Fishing and Related Industries Compensation (Marine Reserves) Act 1997* provides a mechanism by which the holder of an existing Fisheries WA authorisation for commercial fishing, aquaculture or pearling may seek compensation if the commercial value of the authorisation is diminished by the establishment of a marine conservation reserve.

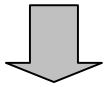
Government documents state that the primary role of MPAs is biodiversity conservation (ie. they are not intended to directly benefit fisheries), but the compensation act also recognises that MPAs can have negative impacts on fishers' socio-economic viability. The act is also a public and political recognition of fishing as a legitimate activity. It is generally agreed in Western Australia that the compensation act has greatly assisted negotiations on MPAs with the commercial fishing industry. However, conservation groups believe that this has been to the detriment of environmental protection.

6.2.4 Details of the MPA planning process

The Western Australian planning process is illustrated by the following flow-chart.

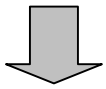
Stage 1 – WA GOVERNMENT

identifies proposed reserve area



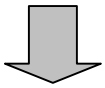
Stage 2 – COMMUNITY INPUT

to develop indicative reserve boundaries & zones for draft management plan - usually via advisory committees



Stage 3 – WA GOVERNMENT

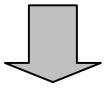
issues Notice of Intent to reserve



Stage 4 – COMMUNITY INPUT

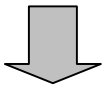
to draft management plan

- via submissions to CALM



Stage 5 – WA GOVERNMENT

finalises management plan and declares marine reserves



Stage 6 – WA GOVERNMENT WITH COMMUNITY INPUT

day to day management of marine reserves

STAGE 1: THE WA GOVERNMENT (CALM) IDENTIFIES PROPOSED RESERVE AREAS

To develop a State-wide system of MPAs, CALM has developed a methodology to prioritise the 70 marine areas identified in the 'Wilson's report' (Simpson and Bancroft 1998). The methodology is based on 14 criteria categorised into 6 ecological criteria and 8 human criteria. The relative (between areas) value of each criterion is given a score between low (1) and high (5), and priorities are determined from ranking the sums of the scores (see Appendix 4 for an illustration). CALM points out that this is not strictly a scientific exercise and should not be considered as such.

STAGE 2: COMMUNITY INPUT TO DEVELOP INDICATIVE RESERVE BOUNDARIES AND ZONES FOR DRAFT MANAGEMENT PLAN

Production of a Regional Perspective Paper

Following the identification of an area for reservation and its rough boundaries, CALM undertakes an assessment of the biological and social values of the area before commencing the planning and consultation process. The information is reported in a Regional Perspective Paper, eg. The Jurien Bay Regional Perspective Paper (CALM 1998), and distributed for public information.

Consultation

Statutory consultation includes the creation of a representative Advisory Committee (appointed by the Minister for the Environment) for the planning of each park.

Besides the establishment of formal Advisory Committees, CALM recognises the need to involve the grass roots community more directly and is currently developing a Public Participation Program (PPP). The goal of the PPP is to develop community ownership of, support for, and participation in the conservation and management of the reserved areas (CALM 2000). Experience with the Jurien Bay Marine Park has shown that broad community participation in government MPA planning processes is often very difficult because of the wide range of interests. To overcome these difficulties, CALM has modified its participation process (Appendix 5). With the new PPP process, members of the Advisory Committee are not representative anymore (Appendix 5) and thus are not expected to protect the interests of any particular stakeholder group. Instead, they must operate in a non-sectoral manner and seek planning solutions that benefit the wider community through consultation with Sector Reference Groups.

Development of an Indicative Management Plan – Example of the Jurien Bay Marine Park

Based on advice from the Jurien Bay Marine Park Advisory Committee, CALM developed an indicative management plan (IMP), which was then submitted for public comments (CALM 2000). This IMP has three major components:

- identifications of key ecological and social values of the area;
- identification of existing and future risks to these values; and
- identification of management objectives and strategies to protect these values.

The Advisory Committee first focuses on identifying the values of an area; then, for each ecological and social value, it identifies:

- existing and potential uses;
- current and potential major pressure(s);
- management objectives;
- management strategies;
- performance measure(s);
- short-term management target(s);
- long-term management target(s).

When assessing pressures on the values of an area (eg. ecological value of seagrass beds), both indirect (eg. effect of nutrient enrichment on seagrass beds from land-based activities) and direct (eg. mooring impact on seagrass beds) are considered, taking into account the following factors:

- temporal scale of the pressure;
- spatial scale of the pressure;
- trophic level and conservation status of the species under pressure (cascading effect on the whole ecosystem);
- probability and frequency of the pressure; and
- consequences of the pressure (ecological and socio-economic implications and manageability of the pressure).

Management objectives have been developed to protect each ecological and social values of the park from potential and future pressures. When there is no obvious existing pressure or threat, the management objectives are formulated in broad terms to address likely future threats.

There are two types of management strategies set out in the Jurien Bay Marine Park IMP:

1. Specific management strategies to address *existing pressures* on the park values (eg. measure to alleviate the current effect of mooring and anchoring in seagrass

beds). Many of these strategies involve increasing users' awareness on environmental problems, developing education programs, and liaising with other government agencies having responsibilities in the marine environment;

2. Generic strategies to address *future pressures* and ensure that their effects are minimised. There are 5 generic strategies:
   - the development of an appropriate administrative framework (establishing objectives of the park and its zoning, regulation, financial needs for management);
   - education and interpretation;
   - surveillance and enforcement;
   - research and monitoring; and
   - public participation.

Management strategies are also divided into high, medium or low priority to provide an indication of their relative importance.

Zoning is used as a key strategy for the conservation of biodiversity and management of human uses. It is used to separate conflicting uses and provide for specific activities such as aquaculture, nature-based tourism, scientific studies, etc. The partial or total restriction of extractive activities in representative habitats is seen as a key strategy in the long-term maintenance of marine biodiversity values of marine parks.

Zoning is also described as a flexible management tool that can accommodate evolving uses of a marine park during the period of the management plan. Significant changes to the zoning of a park require comprehensive public consultation and the approval of the Ministers for the Environment, Fisheries and the Mines.

From reading the IMP, it appears that the development of performance indicators for each identified value is a difficult task; most of them have not been developed yet (particularly in the case of social values).

The IMP also sets out long and short-term management targets. Ecological targets will be set as either the 'natural state' or some acceptable departure from the 'natural state'.

STAGE 3: THE WA GOVERNMENT ISSUES A NOTICE OF INTENT

After it was finalised, the Jurien Bay Marine Park IMP was presented to the MPRA for consideration, and agreements from the Ministers for the Environment, Fisheries and the Mines were obtained. The Minister for the Environment then formally

published a Notice of Intent to declare the park and released the indicative management plan for public comments.

STAGE 4: COMMUNITY INPUT TO DRAFT MANAGEMENT PLAN

There is a statutory three-month public submission period after the Notice of Intent. All submissions are summarised and assessed by CALM according to pre-established criteria, including (CALM 2000):

1. The IMP may be amended if a submission:
   (a) provides additional resource information of direct relevance to management;
   (b) provides additional information on affected user groups of direct relevance to management;
   (c) indicates a change in (or clarifies) Government legislation, management commitment or management policy;
   (d) propose strategies that would better achieve management objectives and aims; or
   (e) indicates omissions, inaccuracies or a lack of clarity.

2. The IMP may not be amended if a submission:
   (a) clearly supports the draft proposal;
   (b) offers a neutral statement or no change is sought;
   (c) addresses issues beyond the scope of the plan;
   (d) makes points that are already in the plan or were considered during its preparation;
   (e) is one amongst several widely divergent viewpoints received on the topic and the strategy of the indicative plan is still considered the best option; or
   (f) contributes options which are not possible (generally due to some aspect of existing legislation or government policy).

A summary of public submissions is to be published along with the final management plan, including an indication of how the plan was amended, or not, in response to the submissions.

At this stage, CALM and WA Fisheries will prepare an estimate of the resources needed for establishing and managing the park for the Minister for the Environment.

STAGE 5: WA GOVERNMENT FINALISES MANAGEMENT PLAN AND DECLARES MARINE RESERVES

Concurrence of agreement from the Ministers for the Environment, Fisheries and the Mines will be sought again. If there is an agreement, the reserve will be declared by an order of the Governor. The Minister for the Environment then tables the reservation order in each House of Parliament, and either House can resolve or disallow it.

STAGE 6: WA GOVERNMENT WITH COMMUNITY INPUT ENSURES THE DAY-TO-DAY MANAGEMENT OF MARINE RESERVES

A Management Advisory Committee will be created for each MPA to ensure its day to day management. In collaboration with the Australian Marine Conservation Society (AMCS), CALM is developing a Marine Community Monitoring Program (CALM 2000) to ensure ongoing public involvement in the management of MPAs. The programme has been developed in three stages:

- 1998: production of an easy-to-use CD-ROM marine identification guide, 'Marine Life in Western Australia';
- 2000: creation of a user-friendly manual of monitoring methods and a database and website to allow easy access to the data;
- ongoing: development of a training programme to ensure monitoring activities are undertaken effectively and safely.

This type of non-statutory community participation is partly funded by the Commonwealth Government Natural Heritage Trust Coastwest/Coastcare program. The main goal is to develop a partnership between managers, scientists and the community in looking after the marine environment. The program is about developing an early warning system for detection of changes in the marine environment. Monitoring methods outlined in the manual cover seagrass monitoring, coral bleaching, beach litter surveys, etc. CALM stresses that this is not meant to replace proper scientific monitoring.

Once implemented, the Jurien Bay Marine Park management plan will remain in place for 10 years, after which it will be reviewed with public consultation and re-submitted to the MRPA and the Ministers for the Environment, Fisheries and the Mines for approval.

6.3 SOUTH AUSTRALIA

6.3.1 Government policy

In *Our Seas and Coasts, A Marine and Estuarine Strategy for South Australia*, the South Australian Government showed its commitment to the development of a State-wide system of MPAs in accordance with the national guidelines for the NRSMPA (South Australia Government 1998). The Department of Environment and Heritage (DEH) has the responsibility for establishing MPAs under the *National Parks Act 1982*.

In 1999, a research report released by the South Australian Research and Development Institute (SARDI) recommended that 27 areas be reserved under IUCN categories I-III (Edyvane 1999). As in the case of the 'Wilson report' in Western Australia, the SARDI report was controversial and not well received by the fishing community.

DEH recently established a Task Force on MPAs, comprising representatives from various stakeholder groups with an interest in the marine environment. The role of this task force will be to select MPAs amongst the list of candidate areas, when such a list is made available. However, industry is concerned that members of the task force do not have the expertise required to carry out the socio-economic analysis during the selection phase of MPAs.

6.3.2 Industry initiatives

The South Australian Fishing Industry Council (SAFIC) published a policy on MPAs in January 1997 (SAFIC 1997), which stated that:

"The establishment of MPAs to help safeguard habitats is generally supported by members of the commercial fishing industry. It is the industry view that the selection and implementation of these areas must be carefully undertaken so as to:

- *Minimise adverse impact on the current sustainability of fishing;*
- *Avoid unnecessary loss of revenue and employment to the State, the commercial fishing industry and the community; and*
- *Ensure that any restrictions relating to the MPA can be practically managed".*

The policy includes 15 recommendations (Appendix 6). To assist with the development of its policy on MPAs, SAFIC created an industry steering group to (SAFIC 1997):

- review the value of the commercial fishing industry to South Australia;
- review areas of critical importance to the commercial fishing industry; and
- review existing MPAs in South Australia.

The steering group identified the following major issues with MPAs (SAFIC 1997):

- The underlying principles for establishing MPAs are, to a large degree, reasonable and simple concepts. In general, the South Australian commercial fishing industry supports these principles. Protecting vital fish nurseries and vulnerable habitats is fundamental to ensuring the sustainability of fish stocks. However, selecting the most appropriate areas for protection will require the consideration of a wide range of biological, economic and sociological information.
- Many of the most valuable South Australian fisheries are managed using an integrated management process, which involves consultation between various stakeholder groups. Given the confidence that the South Australian Government has in this integrated management process, it is particularly concerning that proper representative forums have not been established to consider the issue of MPAs in the State.
- As an indication of industry's genuine commitment to establishing MPAs, consultation will be conducted with the wider fishing community to select areas that industry considers appropriate for declaring as MPAs (see discussion on the *MPA Reference Group* below).
- The displacement of fishing effort resulting from MPAs will threaten the sustainability of the fish stocks if not compensated for;
- Although some biological benefits may flow to commercial fisheries, the major beneficiary of MPAs is the community;
- It has become evident that many members of Government steering committees and working groups in charge of developing MPAs have little knowledge and understanding of the fishing industry;
- To have the management plan of a marine park developed after the park has been declared does not allow the Government and various stakeholder groups to fully debate the implications of the park, especially where large multiple-use parks are concerned;
- When fishing restrictions are being considered, they should be applied consistently to all groups.

In 1999, SAFIC also produced its Oceans Policy (SAFIC 1999), which identified additional issues with MPAs:

- the need to consider fisheries sustainability, wealth generation and security of investment; and
- the need to clearly assess available fish resources and relative access shares for all stakeholders to ensure equitable re-allocation following MPA implementation.

SAFIC created an MPA Reference Group in early 1999 to discuss the role of MPAs as a fisheries management tool and for industry to make recommendations to government. The group was made of industry members, scientists and conservationists. The success of this group has been limited by the lack of government support (the departments of Primary Industries and Resources SA – PIRSA- and DEH declined the group's repeated invitations to send representatives), and by the current split within the South Australian fishing industry between SAFIC and the Seafood Council SA. The two industry groups disagree on how industry should respond to MPA government initiative. The Seafood Council appears to be opposed to any new marine park until the Government explicitly (ie. through legislation) deals with the financial implications of marine parks.

In October 1999, SAFIC held three public workshops in Robe, Adelaide and Port Lincoln (SAFIC 2000). Staff from Environment Australia, PIRSA and DEH were invited to make presentations and discuss issues raised by the development of the NRSMPA. However, the consultation between industry and government has since been hampered by uncertainties regarding the Government's position on compensation issues. It appears that the list of candidate areas identified by the Government will not be released to the fishing industry before these compensation issues have been resolved[9].

6.4 VICTORIA

The situation in Victoria deserves to be examined in some detail because of the important events that happened recently (May-June 2001).

In Victoria, government fisheries (Fisheries Victoria) and conservation (National Parks, Fauna and Flora) agencies are both under the responsibility of the Department of Natural Resources and Environment (NRE). This department has three Ministers:

[9] The situation in South Australia has evolved since the writing of this report. The Government has apparently established a list of sites for MPAs and is currently drafting compensation mechanisms and consultation protocols.

Environment, Energy and Ports, and Agriculture. National Parks, Fauna and Flora has the responsibility for biodiversity conservation, MPA policy development and MPA management. MPAs are declared under the *National Parks Act 1975*.

6.4.1 A nine-year marine and coastal investigation

The Land Conservation Council (LCC) was established by the *Land Conservation Act 1970*. In 1991, the Victorian Government required the LCC to conduct an investigation of marine, coastal and estuarine areas and to make recommendations on integrated management. The identification of areas for reservation was one component of the investigation.

An Environmental Inventory programme for Victoria's ecosystems was initiated in 1992 to assist bioregional planning and the development of MPAs. NRE conducted the inventory (Hamilton 1994, Ferns 1999, 2000; Ferns and Hough 1999, 2000; VIMS *et al.* 1994). The programme was undertaken concurrently with the LCC investigation to which it provided ecological information for the selection of candidate areas.

The LCC investigation went through three periods of public comments (1993, 1995 and 1996). The LCC Draft Final Recommendations (LCC 1996) covered many issues related to the integrated management of Victoria waters. With regard to MPAs, it recommended:

- 20 multiple-use marine parks (representing 19% of Victoria's marine area);
- 21 sanctuary (no-take) zones within the multiple-use parks;
- Reservation of all other areas as Coastal Water Reserve to provide for the integrated multiple-use management of a range of recreational and commercial activities.

In June 1997, the *Land Conservation Act 1970* was revoked and replaced by the *Environment Conservation Council Act 1997* (Victoria Government 1997), under which the LCC was replaced by the Environmental Conservation Council (ECC). The ECC consists of three members (appointed on the Minister's recommendation) and reports directly to the Minister for Environment and Conservation.

The new terms of references for the ECC's investigation required the Council to, amongst others, give priority to the progressive establishment of a representative system of marine parks. In making these recommendations the Council was to have regard to previous work by the LCC and to the Oceans Policy.

Also, according to the Act, in conducting its investigation, the ECC was to have regard to:

(a) the ability of any existing or proposed development or use of the land or resources to be ecologically sustainable and economically viable;
(b) the economic and social value of any existing or proposed development or use of the land or resources;
(c) the existence of and the need to conserve and protect any areas of ecological, historical, cultural or recreational value or areas of landscape significance on the land;
(d) the need for the creation and preservation of a comprehensive, adequate and representative system of parks and reserves within the State;
(e) any international obligations entered into by the Commonwealth and any national agreements entered into or obligations undertaken in conjunction with the Commonwealth and the other States and Territory which relate to the subject matter of the investigation;
(f) the need to protect and conserve biodiversity.

The ECC appointed a Marine, Coastal and Estuarine Advisory Group to assist with its investigation. The group was expertise-based (as opposed to representative), with nine members including individuals from State and Commonwealth government agencies, and people with backgrounds in the aquaculture industry, recreational fishing, commercial fishing, research, rural communities and conservation. The ECC final recommendations released in August 2000 concluded a nine-year investigation, which included six formal periods for public comments.

At the core of the ECC final recommendations (ECC 2000), was the establishment of:

- 13 highly protected Marine National Parks (IUCN categories I or II);
- 11 smaller highly protected Marine Sanctuaries to complement the Marine National Parks and to protect special values (IUCN categories I or II);
- 18 special management areas where special values are highlighted but which generally require a lower level of protection (IUCN category IV); and
- Reservation of all other marine areas as a Coastal Marine Reserve to provide for a range of activities that are compatible with long-term sustainable use and to provide for the integrated management of Victoria's marine and coastal environment.

The ECC also recognised that the 12 existing marine parks and reserves, which were established between 1979 and 1991, make a substantial contribution to the establishment of a representative and comprehensive system of marine parks in Victoria.

The ECC made its recommendations in a 'one size fits all' manner, providing general lists of objectives and permitted/not permitted activities that were common to all marine national parks and marine sanctuaries (ECC 2000). The lists were:

- a list of objectives, including:
  - (i) conserve and protect biodiversity and natural processes;
  - (ii) maintain natural ecosystems as a reference against which other areas may be compared (for parks only);
  - (iii) provide opportunities for recreation and education associated with the enjoyment and understanding of natural environments, where consistent with (i) and (ii);
- a list of activities permitted (eg. recreation, research);
- a list of activities not permitted includes (eg. fishing, aquaculture, oil and gas extraction).

The final report also gave very brief descriptions of the recommended marine national parks and sanctuaries, including approximate boundaries and area, general description of environmental values, aboriginal interests, community views, general social and economic implications (for marine national parks only, not for sanctuary zones). These descriptions included very general and succinct management recommendations. In some cases, the report acknowledged that a proposed reserve would have an impact on commercial fisheries, but it did not provide any specific recommendations on how to address this impact.

6.4.2 An unclear planning process

6.4.2.A Multiple-use principle amended

In its final recommendations, the ECC has significantly altered its approach to marine parks and moved away from previous LCC recommendations (LCC 1996), and from its own (ECC 1998), with regard to the development of multiple-use marine parks. It claims that the proposed system of highly protected areas within a State-wide Coastal Marine Reserve is an expression of multiple-use management of the marine environment. The ECC also partly justifies its recommendations for establishing highly protected marine national parks by saying that the objectives of no-take areas are clear and easily communicated, that there is no discrimination between commercial and recreational fishers, and that it ensures easier compliance with regulations.

6.4.2.B Unclear scientific identification and selection process

The actual process to identify and select candidate areas is very poorly described in the various LCC and ECC reports. The ECC broadly described the factors considered in developing the system of highly protected areas as follows (ECC 2000):

- the system of MPAs must represent the range of habitats within each of the five bioregions identified in Victoria;
- eight major habitats were identified;
- more than one example of each major habitat was included in the system (replication as an insurance against unforeseen damaging events);
- in addition to representative values, special values have been taken into account, including high diversity of habitats, high diversity of species, habitats of rare, endangered, uncommon or depleted species, nursery, feeding, breeding or rest areas, and rare or unique habitats.
- the size of the areas was chosen to be 5 to 7 km of coastline minimum, based on the results of one Tasmanian study (Edgar and Barrett 1999);
- Areas were generally selected where the environment is relatively undisturbed (eg. adjacent to national parks on lands); and
- where there is a choice between candidate areas, the ECC recommended areas where the impact on industry, users and local communities was minimised.

The scientific justification put forward by the ECC for the implementation of highly protected areas was also very poor. In its 1999 report, the ECC gave limited explanation regarding the representativeness criterion used to select areas. Rather, to justify the implementation of no-take areas, the ECC described in very broad and vague terms the threats that fishing, 'even when using benign and sustainable practices', can cause to the marine environment and ecosystem diversity. The report put particular emphasis on the potential impact of fishing on the genetic make-up of fish stocks. Highly protected areas were described as providing protection against such threats and acting as stocking sites for many species.

Scientists from the Fisheries Co-Management Council Research Committee have described the ECC's claims as naive and scientifically flawed (Appendix 7). They concluded that the report "exposed the ECC to severe criticism of poor scientific judgement, unacceptable generalisation, selective use of literature and a fundamental lack of understanding of the population and local dynamics of marine resources and their environment."

The influence of the release of the Oceans Policy in 1998 is obvious in the later reports by the ECC. In the August 2000 ECC Final Report, the justification for the

establishment of no-take areas clearly shifted from addressing fishing impact to embracing the national guidelines and the CAR principles. Explicit reference to threats from fishing were dropped or attenuated. This shift in the ECC's stated rationale for establishing no-take areas illustrates a poor understanding both of the nature of fishing impacts on the environment, and of how no-take areas could address fisheries issues and protect biodiversity.

6.4.2.C Costing and management issues

The LCC stressed (LCC 1996) that its recommendations for reservation were made on the assumption that sufficient staff and finances would be provided for appropriate management (and particularly for enforcement). It also emphasised the desirability of creating a focused body to implement its recommendations and overcome the existing fragmentation of responsibility and legislative deficiencies in integrated coastal management. It even discussed the option of developing a new '*Marine and Estuarine Management Act'*, but finally suggested that integrated management be implemented through existing legislation, with amendments as required.

The ECC claimed in its 1998 Interim Report that it had not made a detailed costing of its recommendations because its role was more of a strategic planner. In its 2000 Final Report, it stated further that 'detailed costings are not provided for implementation, as discussions with management agencies suggest that there is a range of funding scenarios, depending on how much integration can be achieved with existing programs'.

6.4.2.D Socio-economic issues

The handling of socio-economic issues and the assessment of the impact of proposed marine national parks and sanctuaries on fisheries have been very poor, despite the terms of references of both the LCC and ECC specifically including to have regard to the social and economic implications of reservation. The ECC acknowledged in its Interim Report that commercial fishers would likely be impacted by its recommendations. However, it also considered that, after seeking advice from management agencies on the socio-economic implications of its recommendations, 'the cost of implementation is reasonable and commensurate with the high value placed on the coast and marine environment by the public' (ECC 1998). Later, probably as a result of public comments, it took socio-economic issues more seriously and commissioned two studies (see reports on these socio-economic studies in ECC 1999 and 2000). However, these studies were again very generic and did not properly address the impact of marine national parks and sanctuaries on fisheries.

The ECC finally acknowledged the seriousness of the socio-economic issues when releasing its final recommendations. The first recommendation (see R1 in ECC 2000) being for government to:

'establish a process to evaluate the requirement for possible mechanisms and level of adjustment that may be required where individuals or local communities are disproportionately affected as a result of the implementation of recommendations for marine national parks and marine sanctuaries'.

This is a rather convoluted recommendation, which carefully avoids making specific reference to compensation. The ECC also makes three surprising statements in its socio-economic assessment sections to down play the impact of marine reserves on Victorian fisheries (ECC 1999, 2000):

- in the case of the finfish fishery, after describing historical catches and associated dollar values, the ECC says that these figures will not necessarily translate into loss to the fishery because some fish species can swim (and be caught) outside the MPAs;
- it then goes on to say that, in the case of abalone, fishing effort will have to be redirected to areas outside the recommended parks;
- finally, it states that 'it is possible that, for the rock lobster fishery, national marine parks may lead in the longer terms, to stock enhancement in adjacent areas. In some overseas cases 'no-take' marine reserves have been used for this purpose'.

Such statements again illustrate the ECC's poor understanding of fisheries and fisheries management issues, and in particularly of the implications of fishing effort displacement. It is a concern that the Victorian Government later embraced these recommendations when drafting legislation to declare the proposed MPAs (see below).

6.4.3 Industry's response to the ECC investigation

The commercial fishing industry has written, or commissioned, several submissions to the successive LCC/ECC reports (WADA-PPFA-WZWFA 1997, Tilbury *et al* 2000; SIV 2000; ID&A 2000, 2001). The fishing industry's main concerns with the 1999 ECC draft report were (SIV 2000):

- lack of socio-economic analysis;
- lack of regard to existing and sustainable resource use;
- misreporting of quantities and values of fisheries resources in proposed areas;
- lack of enforcement;

- lack of scientific justification for having all proposed reserved areas as no-take areas;
- too many generalisations lacking quantifiable supporting material; and
- lack of information on structure and costing to manage all proposed areas.

At the release of the ECC Final Report in August 2000, the fishing industry was particularly concerned that some issues it had raised about the 1999 draft report had not been addressed, and that the ECC did not properly consult with fishers when preparing its final recommendations. The ECC socio-economic assessment of the impact of proposed highly protected areas on the fishing industry was very poor. According to the industry, the ECC estimates (based on market values) were about half of industry's own estimates (SIV 2001). SIV also pointed out that socio-economic assessments need to include capital costs (access licences, boats and gear), value added, export value, and costs of import replacement.

The commercial fishing industry commissioned ID&A in January 2001 to review existing information and provide an alternative report to the ECC report, 'A Preferred Approach for the Establishment of a Representative System of Marine Parks in Victoria' (ID&A 2001). The thrust of ID&A report was that the location of industry proposed marine reserves generally coincided with the ECC recommendations, but the status of some of them would be changed from highly protected areas to multiple-use areas, in accordance with the ESD principles promoted by the Oceans Policy. The industry's alternative included no-take areas and multiple-use management zones covering about 3.8% and 5.5% of Victorian coastal waters, respectively (SIV 2001).

6.4.4 The Victorian Government response to the ECC final recommendations and subsequent events

The ECC gave its final recommendations to the Minister for the Environment and Conservation on 24 October 2000. On 17 May 2001, the Minister formally accepted the recommendations, after minor adjustments, and committed the Government to implement them from 16 November 2001 (the Government does not appear to have taken the industry's alternative proposal into account). The Minister introduced the *National Parks (Marine National Parks and Marine Sanctuaries) Bill* into parliament, in which she committed the Government to invest $39 million over four years to establish the parks system.

Three issues with the bill instantly generated strong opposition from the commercial fishing industry (SIV 2001):

- Restriction of fishers' constitutional right to access the supreme court (section 85 of the bill): the proposed bill included a constitutional change that would have removed fishers' right to seek compensation through the supreme court.
- Amendment of the Fisheries Act: the bill was to have wider implications as it would have banned fishers from seeking compensation for loss of property rights in any legal dispute; it would have removed compensation for fishers for non-marine park issues normally dealt with under the Fisheries Act (the fishing industry is uncertain about the Victorian Government's later claims that this was a drafting error).
- The bill was classified as an Appropriation Bill, meaning that it could not be amended, it could only be accepted or rejected.

The Victorian Scrutiny of Acts and Regulations Committee (SARC)[10] made the following comments: " The committee is concerned the no-compensation payable clauses…appear very broad and on the face of them may remove any claim for compensation whether or not such claim touches or concerns the creation of the marine parks and sanctuaries established by the Bill. If the provisions do have such a wide ambit they may trespass on property rights…" (SARC Alert Digest No 7 of 2001, available on www.parliament.vic.gov.au).

The chronology of events that followed the Government's response was:
- 17 May 2001: the Minister for Environment and Conservation accepts the ECC's recommendations and tables the marine park bill;
- 29 May 2001: 1500 to 2000 fishers and families march on the State Parliament in protest of the proposed bill;
- 12 June 2001: there is a stand-off between the State Government and the State Opposition over compensation for fishers; the Environment Minister gives the Opposition 24 hours to support the Government's bill unamended or it will be withdrawn;
- 13 June 2001: The Victorian Government withdraws its bill from parliament after it was unable to secure the support of the opposition parties.

In its published response to the ECC recommendation (Appendix 8), the Government had envisaged a number of measures to assist the industry to adjust and relocate their fishing effort as a result of the establishment of proposed marine national parks and sanctuaries:

[10] The Scrutiny of Acts and Regulation Committee is a Joint House Committee of the Parliament of Victoria, with members from the Legislative Assembly and Legislative Council. The nine-members Committee is bi-partisan in nature (5 of its members are government back-benchers).

- transitional financial assistance;
- enhancement of enforcement;
- a phase out of fishing in some marine national parks and sanctuaries;
- adjustments to ECC recommendations to reduce fishing impacts; and
- performance assessment and monitoring.

As part of the transitional assistance, the Government was to allocate $1.2 million to help fishers cover the costs of searching for new grounds further afield, as long as they could prove that their catches had been affected by the marine parks. The Government considered that these measures were sufficient and that the combined effect of a crackdown on poaching and the search for new grounds would make up for the impact of locking fishers out of marine parks and sanctuaries.

Regarding performance assessment and monitoring, the Government's response acknowledged that these were important issues repeatedly raised by the community and industry, but offered little more than a verbal commitment that they would be addressed. More disconcertingly, it also said that fisheries reports regularly produced by fisheries agencies would assist in monitoring the impact of no-take areas on the fisheries resources (Appendix 8). It is well known that the type of data and scientific methods routinely used to conduct fisheries stock assessment are not adequate to detect an MPA effect on fish stocks. Again, this demonstrates a lack of understanding of fisheries and fisheries management issues at the highest level of government decision making, and an unfounded assumption that the ECC-designed highly protected areas will deliver benefits to fisheries in Victoria.

Since the withdrawal of the marine park bill, the Victorian Government has re-stated its commitment to create a comprehensive system of marine national parks and sanctuaries. Options for their establishment, including the possibility of introducing individual legislation for each park and sanctuary, or of increasing compensation or assistance to fishers were being examined. In early August 2001, the Australian Conservation Foundation called again on both government and opposition parties to support the development of the system of fully protected marine parks. It urged the Government to develop an independent process to assess commercial fishers' eligibility for compensation.

6.5 TASMANIA

6.5.1 Background

A number of marine reserves have been implemented in Tasmania over the years under *The National Parks and Wildlife Act 1970* (for conservation purposes) and under the *Living Marine Resources Management Act 1995* (for fisheries purposes). Fishing is banned in many of these reserves. Under the *National Parks and Wildlife Act*, any change to a marine reserve requires an Act of Parliament, but fisheries regulations within a reserve can be changed by the Minister.

In 1990, the Tasmanian Government produced its first strategy on marine protected areas, the *Joint Policy for the Establishment and Management of Marine Reserves in Tasmania* (Tasmania Government 1990). Under the Joint Policy, and because *The National Parks and Wildlife Act 1970* cannot be used to regulate fishing activities within a marine reserve, new marine reserves are to be established under both the *National Parks and Wildlife Act 1970* and the *Living Marine Resources Management Act 1995* (MMIC 2001). Five marine reserves have been declared since 1991 under the Joint Policy.

Marine reserves were initially managed by the Department of Environment and Land (DELM) and the Department of Primary Industry and Fisheries (DPIF). In 1998, both departments were incorporated into the new Department of Primary Industry, Water and Environment (DPIWE).

The *Marine Reserve Management Bill 1997* was tabled in Parliament in 1998 and created much opposition from industry groups. It was eventually adjourned in the Upper House by upcoming State elections. The point of contention was that the bill apparently proposed to establish at least one no-take marine reserve in each of the Tasmanian bioregions (10 bioregions were considered in Tasmanian at the time), without providing clear justification.

6.5.2 Development of the Tasmanian MPA strategy

In August 1999, the new Minister for the DPIWE created the Marine and Marine Industries Council (MMIC), consisting of 18 members representing a wide range of stakeholder groups. The first task of the Council, to be completed within 6 months, was to develop a policy framework for the development of a system of MPAs in Tasmania.

In April 2000, DPIWE produced a Tasmanian Marine Protected Areas Strategy Background Report (DPIWE 2000). The report described marine ecosystems, biodiversity and marine management systems in Tasmania. MMIC released the Draft Tasmanian Marine Protected Areas Strategy for public comments in July 2000 (MMIC 2000) and the final strategy in August 2001 (MMIC 2001).

Overall, the primary and secondary goals, principles, and implementation mechanisms outlined in the Tasmanian MPA strategy closely follow the national guidelines (ANZECC TFMPA 1998). The primary goal is to establish and manage a comprehensive, adequate and representative system of marine protected areas, as part of the development of the NRSMPA. The regional planning will rely on the IMCRA report (IMCRA Technical Group 1998), and on a series of ecological studies defining ecosystems and identifying priority areas for marine conservation (see references in DPIWE 2000).

The strategy includes a 12-step process for identifying and selecting MPAs. The first of these 12-steps is the appointment by the Tasmanian Government of the Resource Planning and Development Commission (RPDC) to carry out the identification and selection work (see www.rpdc.tas.gov.au for details on the Commission's role in Tasmania). Following the release of the strategy, the State Government announced that it would fast-track the designation of two sites: Port Davey/Bathurst Harbour and the Kent Group of Islands, which had been discussed for some time already (MPA News October 2001). The RPDC has been asked to undertake a shortened assessment of these two sites and to make its final recommendations by 31 July 2002.

With regard to displacement[11] issues, the strategy states that 'The Tasmanian Government recognises the importance of displacement issues. To address these issues, the Tasmanian Government has agreed to establish a process for providing special adjustment payments on a case by case basis (*ex poste*) to certain individuals directly affected by a Marine Protected Area' (MMIC 2001).

6.5.3 Scientific information

Four marine reserves established in 1991, and in particular the Maria Island Marine Reserve, are often used as a reference in the literature on MPAs. They are used as examples of temperate marine reserves being monitored over a long period. However, scientific opinion on their benefits is not unanimous, as discussed below.

[11] The word *compensation* was removed from the final MPA strategy. It had been initially used in the draft strategy, in association with *displacement*, as part of the principles underlying the development of MPAs.

The four reserves were declared for a variety of reasons (Edgar and Barrett 1999): the largest reserve (Maria Island Marine Reserve, covering 7 km of coastline) was primarily declared to conserve representative marine habitats, while the three other, much smaller, reserves (covering 1 to 2 km of coastline) were declared to protect an unusual habitat or for recreational purposes.

The former DPI and DELM, and the University of Tasmania established a collaborative monitoring program for the four reserves and regular surveys were undertaken during a 6-year period, from 1992 to 1997 (no surveys were undertaken prior to the declaration of the reserves). The major aim of the program was to determine whether protection from fishing would increase the abundance and size of species within the reserves (the study focused on reef associated species), and to identify any indirect effect of fishing on marine ecosystems (Edgar and Barrett 1999).

The study detected significant differences in species abundance and average size of individuals between fished and unfished reserve areas. The conservation effect of two of the reserves related primarily to a disproportionate presence of large fish species (eg. bastard trumpeter, *Latridopsis forsteri*), which were virtually absent outside the reserves (Edgar and Barrett 1999). However, the authors acknowledged that the presence of large schools of bastard trumpeter at Maria Island could have been related to a major recruitment event observed in 1994-95 and that more surveys were necessary to check whether the population density remain as high. Anecdotal information indicates that the large schools of bastard trumpeter were not present at Maria Island during recent (2001) underwater surveys.

The three major commercial species groups (rock lobster, abalone and large fish) responded differently to protection from fishing. The abundance and size of rock lobsters tended to increase, but the abundance of abalone decreased in all reserves by at least 30% (possibly due to predation). The authors have not attempted to assess fisheries benefits through larval dispersal and adult spill-over and they recognised that claims regarding fisheries benefits remain speculative until proper tagging studies are done (Barrett and Edgar 1998a, 1998b, Edgar and Barrett 1999). For example, the spillover of bastard trumpeter was apparently hindered by natural barriers (sand beaches), showing the importance of MPA location to achieve fisheries benefits.

Edgar and Barrett's monitoring study in Tasmania has had significant implications elsewhere in Australia, and particularly in Victoria. In their 1999 paper, the authors commented that the largest of the four reserves (Maria Island Marine Reserve) appeared to be more effective than the smaller reserves. As seen before, it is on the

basis of this single study that the Victorian Environment Conservation Council decided that MPAs should extend for at least 5-7 km of coastline (ECC 2000). However, the authors of the Tasmanian study themselves had stated that 'this size/effectiveness relationship may result solely from chance, with further work needed to determine whether the relationship is generally true or a consequence of particular conditions unrelated to size that particularly enhance the effectiveness of the Maria Island reserve.'

Edgar and Barrett's optimism about the benefits of MPAs to fisheries may be somewhat challenged by a study currently under-way at the University of Tasmania (Gardner *et al*. 2000, Buxton *et al*. 2001). In 1999, the Tasmanian Aquaculture and Fisheries Institute, University of Tasmania, began a three-year modelling study, titled 'The effects of MPAs as a fisheries management tool' (FRDC Project Number 1999/162), to look at the effects of area closures on the rock lobster and abalone fisheries. The project investigators stress that the tacit acceptance that fishery enhancement is achieved with the declaration of MPAs is urgently in need of validation. They aim to investigate both positive and negative potential impacts of MPAs by incorporating in their models effort displacement, existing management tools (input control and TAC), larval dispersal, fleet dynamics, and spatial variation in biological parameters.

As part of this study, Gardner *et al*. (2000) modelled the effects of large MPAs on the catch, egg production, and biomass of Tasmanian rock lobsters, and the effects on the TAC-based management of the fishery. Preliminary results indicate that the effects of MPAs are influenced by significant State-wide variation in growth and reproduction of rock lobsters. Fishing effort displaced by reserve management would be directed to areas where rock lobsters grow and mature differently and, as a consequence, the impacts of MPAs on the stock could be either positive or negative depending on their locations.

In the case of the abalone fishery, preliminary results indicate that (Buxton *et al*. 2001):

- large MPAs appear to offer little direct fisheries benefits in terms of yield and recruitment to the abalone fishery. This is mostly as a consequence of the movement dynamics of the species, which includes limited larval dispersal and limited adult movement;
- under certain circumstances MPAs may have significant effects on the fishery, particularly when fishing effort is displaced into immediately adjacent areas. In a quota-managed fishery, the consequence of this displaced effort into smaller areas is equivalent to increasing the TAC;

- large closures would not be sustainable unless there was a reduction in the TAC; and
- MPAs provide invaluable references sites and sources of information in relation to the ecological effects of fishing and are considered to be an important tool in the management of abalone fisheries.

6.5.4 Industry's position

As observed in other States, the Tasmanian Government strategy on MPA outlines principles and implementation mechanisms in very broad and generic terms. During the development of the strategy, the industry was concerned that MMIC relied too much on the national guidelines, which were established without their input, and considered that these guidelines should be reviewed and adapted to Tasmanian circumstances.

From the industry's point of view, the strategy does not address industry's specific concerns (eg. unclear mechanisms to select MPAs, assess socio-economic impact of MPAs, assess the costs of managing and enforcing MPAs, etc.) The industry complains that issues important to its members, such as compensation, were not discussed at MMIC meetings in the drafting of the MPA strategy. While not totally opposed to the creation of MPAs, the industry believes that a co-operative approach with support from the major stakeholders, including local governments, is absolutely essential.

The industry has always been opposed to plans to establish Port Davey/Bathurst Harbour and the Kent Group of Islands as MPAs. These areas represent important fishing grounds and safe-anchoring sites in remote and stormy parts of the State. The final strategy now includes a mention that safety issues will be taken into account when identifying and selecting MPAs (MMIC 2001).

The Tasmanian fishing industry is also concerned with the IMCRA delineation of bioregions, which is, despite being qualified as interim, a driving factor in the identification and selection of MPAs. Both industry and scientists emphasise the need to map marine habitats more accurately before establishing MPAs. To address this problem, the Tasmanian Aquaculture and Fisheries Institute (TAFI) began a new project, "SeaMap Tasmania", in 2001. The aim of the project is to provide a complete habitat map of all Tasmanian waters. The first section of this mapping project covering the (IMCRA-defined) Bruny bioregion was completed recently and showed that the IMCRA boundaries were incorrect (Barrett *et al*. 2001).

The industry also demands that the Government conducts a thorough audit of existing protected areas before new ones are declared. In Tasmania there are a total of 134 Fishing Restricted Areas and 168 Marine Farm Areas declared under the *Living Marine Resources Management Act 1995*, which limit fishing activities in some form or other (DPIWE 2000). Government employees have stated that some of the existing closed areas could be upgraded and incorporated in the system of protected areas (DPIWE 2000). In 1996, TFIC and the Tasmanian Amateur Sea Fishermans Association formed a rare partnership and, after lengthy consultation with their members and the wider community, recommended 5 Marine Propagation Areas (Richey 1998). It is unclear whether these industry-driven proposals will be considered by government.

Finally, the industry points out that, given the current economic difficulties faced by Tasmania, the Government should support and encourage the fishing industry and local communities to grow and expand their economic base and job opportunities, rather than support a policy that proposes to limit access to marine resources.

6.6 NEW SOUTH WALES

In New South Wales, marine reserves can be declared under three different acts (see www.fisheries.nsw.gov.au for details):

- Marine Parks are declared under the *Marine Parks Act 1997* and managed by the Marine Parks Authority. They are large multiple-use areas designed to conserve biodiversity;
- Aquatic Reserves are declared by the *Fisheries Management Act 1994* and managed by NSW Fisheries. They are generally smaller than marine parks and are designed to both protect biodiversity and meet specific management objectives; and
- Extensions of land-based National Parks and Nature Reserves in marine and estuarine waters are declared by the *National Parks and Wildlife Act 1974* and managed by the National Parks and Wildlife Service (NPWS).

There are about 70 areas reserved under the National Parks and Wildlife Act. They consist essentially of estuarine and intertidal lands but include some marine waters. There are eight aquatic reserves and three marine parks (Solitary Islands, Jervis Bay and Lord Howe Island). The Solitary Islands Marine Park replaced the Solitary Islands Aquatic Reserve previously declared under the Fisheries Management Act.

6.6.1 The Marine Parks Act 1997 and the Marine Park Authority

The Marine Parks Act 1997 established the Marine Parks Authority that consists of the heads of NSW Fisheries, NSW National Parks and Wildlife Service, and the Premier's Department. The task of the Authority is to develop and manage a comprehensive system of marine parks in NSW.

The Authority has no employees of its own and draws resources from NSW Fisheries and NPWS, which both provide financial, administrative, and staff support.

6.6.2 Government MPA policy

The NSW Fisheries and NPWS, on behalf of the Marine Parks Authority, developed a Draft Framework for Establishing a System of Marine Protected Areas in NSW (Marine Parks Authority 2000). The framework is described in very generic terms and provides little practical details (it is currently under review). Its main features are:

- the NSW Government has adopted the national guidelines and the IMCRA marine bioregions (ANZECC TFMPA 1998, IMCRA 1998); the NSW system of MPAs will be designed to be part of the NRSMPA;
- the system of MPAs will comprise a comprehensive, adequate and representative system of generally large multiple-use MPAs;
- the five bioregions in NSW will be assessed systematically to identify which areas should be declared as MPAs;
- one bioregion is already represented by the Solitary Islands Marine Park; the remaining four bioregions are to be assessed sequentially, with all bioregional assessments to be finalised by 2005;
- an assessment consists of classifying marine habitats and identifying candidate areas for reservation based on the recommended national criteria and using advanced computer mapping techniques linked to a geographical information system (GIS);
- an assessment also includes reviewing the role of existing marine protected areas; and
- current assessment work is assisted by funding from Environment Australia and the National Heritage Trust.

Bioregional assessments are to be achieved through collaboration between the NSW Fisheries and NPWS. The two agencies will remain responsible for establishing, declaring and managing their own MPAs under their relevant legislation. The

establishment of the Marine Parks Authority was intended to facilitate their cooperation and the coordination of their programmes.

On 8 May 2001, NSW Fisheries released a public consultation paper on the Selection Process for Candidate Aquatic Reserves for Rocky Shores and Estuaries – Batemans Shelf and Hawesbury Shelf Bioregions (see www.fisheries.nsw.gov.au for details). This report was seeking community comments on 22 candidate aquatic reserves, which were identified within two NSW bioregions during a two-year study by NSW Fisheries. Although, it is said in the report that Aquatic Reserves are part of, and complement, the NSW system of MPAs, it is unclear how the process for the identification and selection of these aquatic reserves is integrated with the Marine Parks Authority's bioregional assessment described above. It is also unclear how the declaration of new aquatic reserves will be integrated with the ongoing creation of Recreational Fishing Areas (see below).

Under the Marine Parks Act, two sets of plans must be prepared as soon as possible after the declaration of a Marine Park: a zoning plan and an operational plan. The zoning plan details the location of different protection zones and the activities allowed in each zone; the operational plan outlines how a Marine Park will be managed on a day-to-day basis. A statutory three-month period of public consultation is required for both plans, and operational plans are to be reviewed every 12 months to determine their effectiveness.

The Solitary Islands and Jervis Bay marine parks adjoin marine protected areas under Commonwealth jurisdiction. In 1999 a Memorandum of Understanding (MOU) was signed between the Commonwealth National Parks and Wildlife Service and the Marine Parks Authority. The aim of this MOU was to ensure cooperative management of marine parks, including sharing resources and costs, cooperative law enforcement, common visitor interpretation and coordinated research.

6.6.3 Public consultation

There are several statutory advisory bodies associated with the Marine Parks Authority (Marine Parks Authority 1999):

- A Marine Parks Advisory Council made of 12 members appointed by the Ministers for Fisheries and the Environment. The council is established to provide for State-wide stakeholders and community consultation; it advises both Ministers for Fisheries and the Environment and the Marine Parks Authority on matters relevant to the selection of marine parks, their zoning and the types of activities that should be allowed within each zone;

- A Marine Parks Research Committee appointed by the Marine Parks Authority. The main responsibility of the Committee is to develop selection criteria for MPAs, monitoring programmes, and a strategic framework to coordinate research work between regional marine park agencies. Shortage in financial and human resources appears to limit the Committee's activities;
- For each MPA, an Advisory Committee is appointed by the Minister for Fisheries and the Environment to facilitate public consultation at the local level. Local advisory committees provide advice to the Marine Parks Authority on zoning, operational plans and day-to-day management.

Also, in an attempt to improve community consultation, NPWS decided to produce Planning Issues and Options Papers for public comments before producing Draft Zoning Plans. These Options Papers discuss the options for zoning but do not show actual boundaries.

According to the Government's draft framework on MPAs, the scope for community involvement will generally be limited to researchers during the bioregional assessment and identification of candidate areas for reservation. However, once candidate areas have been identified, community involvement becomes critical in the selection process. The draft framework states that "the NSW Government proposes to consult widely with the community and stakeholders at this time", but no details are provided.

NPWS organised community meetings in late September 2000 to introduce the first bioregional assessment (the Manning Shelf Bioregional Assessment) and the overall process for establishing a system of MPAs in NSW. These meetings proved difficult. While meeting participants apparently accepted the concept of MPAs, they were concerned with how areas would be selected and managed. As a result of these meetings, NPWS decided that 'more basic education of, and better consultation with the community would help in preventing misinformation and unnecessary conflict, as well as providing better ongoing management' (NSW Marine Parks News 2001).

6.6.4 Important events that affected the NSW commercial fishing industry

6.6.4.A Plans to turn some NSW bays and estuaries into 'recreational only' fishing areas

This is a very controversial issue that has monopolised the NSW commercial fishing industry for some time and used a significant amount of its resources. In 2000, NSW Fisheries made a major change in the management of fisheries, with the introduction of a general recreational fishing fee and the creation of Recreational Fishing Areas

(RFAs). RFAs are created to improve recreational fishing by changing commercial fishing practices in areas popular to anglers. This can involve closing certain areas to commercial fishing, or changing or banning a commercial fishing method within a specified area (NSW Fisheries 2000). RFAs are created by buying out commercial fishers using money from the recreational fishing fee. NSW Fisheries says that "commercial fishers whose licences are bought out to create a RFA will be fairly compensated".

NSW Fisheries sought nominations from the community for areas that should be considered for recreational fishing areas within eight coastal regions. An issues paper was then prepared for each region outlining economic, social and ecological issues (the first issues papers were on Lake Macquarie and Botany Bay). Public comments on these papers were closed in August 2001. NSW Fisheries anticipates that the State-wide process will be progressively established within two years.

This resource re-allocation process is likely to interfere with the ongoing development of a system of MPAs. For example, could a newly declared RFA be selected as part of the NSW system of MPAs and what would be the implications? Would the fishing fee paid by recreational fishers be regarded as fishing rights?

6.6.4.B Environmental assessment needed for granting commercial fishing licences

Also in 2000, Sustainable Fishing and Tourism Inc. won a court action against the NSW Minister for Fisheries arguing that commercial fishing licences were granted unlawfully in breach of Part 5 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). On 21 January 2000, the Land and Environment Court held that the Minister must perform an assessment under the NSW EP&A Act when issuing commercial fishing licences under the *Fisheries Management Act 1994*. While only one fisher's licence was under challenge in this court case, the implications for all commercial fishing licences issued in NSW were clear. NSW Fisheries is now preparing Environmental Assessment Guidelines for Commercial Fisheries Management Plans.

6.7 QUEENSLAND

6.7.1 State marine parks

Queensland has six State marine parks declared under the *Marine Parks Act 1982*, and managed by the former Department of Environment and Heritage (DEH), now

replaced by the Environment Protection Agency (EPA). In 1998, the Queensland Parks and Wildlife Service (QPWS) was created within the EPA with the responsibility, under the Marine Parks Act, to revitalise the management of Queensland's protected areas.

Three of the State marine parks are within to the Great Barrier Reef (GBR) region. The QPWS and the Great Barrier Reef Marine Park Authority (GBRMPA) have implemented joint management arrangements to ensure complementarity of zoning between State marine parks and the Great Barrier Reef Marine Park.

There is also an extensive system of fish habitat areas (about 80 covering about 603 000 hectares of mostly mangrove and seagrass habitats) declared under the *Fisheries Act 1994* (QPWS 2000). These areas are managed by the Queensland Fisheries Service (which in 2000 amalgamated the former Queensland Department of Primary Industry Fisheries Group and Queensland Fisheries Management Authority).

In May 2000, the QPWS released its MPA strategy: Marine Protected Areas in Queensland - A Draft Planning Framework (QPWS 2000). The key points of the framework include:

- adoption of a more systematic, or structured, approach to the conservation of biodiversity and establishment of a representative system of MPAs (however, the document fails to explain what a 'systematic approach' would entail);
- adoption of the national guidelines and bioregionalisation approach (ANZECC TFMPA 1998, IMCRA 1998); and also more work to be done on mapping ecosystems within each bioregion;
- reclassification of fish habitat areas as Habitat Management Areas (IUCN Category IV) as part of the system of MPAs.

In the end, the Draft Framework offers little in the way of planning guidelines and does little more than making generic statements about MPA-related issues. For example, the document recognises that designation of no-take areas might have economic impacts on the commercial fishing industry, and that displacement of fishing effort might require adjustment of fisheries management regimes. However, it does not provide directions on how to address these impacts. Instead, it states that "on the other hand, some studies have demonstrated that no-take areas can benefit fishers in some situations."

The Queensland commercial fishing industry made a detailed submission to the Draft Planning Framework, pointing out to its lack of clear scientific and policy direction (QSIA 2000). The industry stressed that its response was not merely a list of

complaints but was seeking a way forward. The key points in industry's response included:

- the framework did not state objectives for MPAs, nor did it outline a process to develop them;
- it did not adequately discuss performance appraisal of MPAs;
- it lacked clear guidelines for obtaining funding for additional enforcement, education and monitoring required to implement a network of MPAs;
- it did not clearly identify and prioritise ecological research required, and ignored the need for economic and social information;
- it lacked a timeframe;
- the QPWS must acknowledge up-front the need to develop structural adjustment mechanisms to offset any negative impacts of MPAs (particularly no-take areas) on the commercial fishing industry;
- the level of protection afforded to the Queensland marine environment under *all relevant legislations* should be represented as a percentage of Queensland waters in each IUCN category, as illustrated below:

IUCN Category	**% of area protected under State Environment Legislation**	**% of area protected under State Fisheries Legislation**	**% of area protected under GBRMPA Legislation**	**Total % of area protected**
Ia	e	f	g	e+f+g
Ib	e	f	g	e+f+g
II	e	f	g	e+f+g
III	e	f	g	e+f+g
IV	e	f	g	e+f+g
V	e	f	g	e+f+g
VI	e	f	g	e+f+g

- bioregionalisation needs to be consistent across jurisdiction and adequately explained to the general public;
- QPWS should not focus on "on-reserve" management to the extent that "off-reserve" management is ignored or compromised;
- QPWS must not confuse "representativeness" with "uniqueness"; and
- MPAs cannot address impacts from land use or marine pests invasion. There must be a concomitant State-wide improvement in the management of catchment areas.

6.7.2 Commonwealth Great Barrier Reef Marine Park and World Heritage Area

The Great Barrier Reef Marine Park was declared under the Commonwealth *Great Barrier Reef Marine Park Act 1975* and is managed by the statutory Great Barrier Reef Marine Park Authority (GBRMPA) jointly on behalf of the Commonwealth and State Governments. The park extends into both Queensland and Commonwealth waters.

The Great Barrier Reef (GBR), which stretches over 2000 km of coastline and covers about 449 000 square km, was included on the World Heritage List in 1981. The GBR Marine Park itself is totally within the World Heritage Area (WHA), of which it represent 93% (344 000 square km). The reminder is made of land (5%) and waters (2%) under Queensland jurisdiction. The GBR Marine Park is the largest Marine Park in the world and has gained an international reputation.

The concept of the park is to achieve conservation of the reef while allowing reasonable multiple-use for activities such as tourism, fishing, boating and research. The GBRMPA has estimated that direct and indirect economic activities within the marine park totalled approximately $2 billion per annum.

6.7.2.A Fishing in the multiple-use Great Barrier Reef Marine Park and Great Barrier Reef World Heritage Area

Under the Offshore Constitutional Settlement, the great majority of fishing activities (line fishing on reefs, trawl fishing, collection) is managed by the Queensland Fisheries Service, under the *Queensland Fisheries Act 1994*, on behalf of the Queensland Government. The Australian Fisheries Management Authority (AFMA) manages the pelagic tuna and bill fish fisheries.

The principal fisheries under Queensland jurisdiction are managed through limited entry mechanisms, including within multiple-use zones of the GBR Marine Park. The direct economic value of commercial fishing in the GBR Marine Park is about $200 million annually.

In recent years, commercial fishing in the GBR World Heritage Area has been the object of increasing controversy among conservation groups. In particular, problems with by-catch of icon species (dugongs and turtles) and illegal trawling in some areas of the GBR Marine Park (Poiner *et al.* 1998) have inflamed the relationship between GBRMPA and the commercial fishing industry.

6.7.2.B Difficult State/Commonwealth Government relationship over the management of the Great Barrier Reef

Concerns that have arisen in recent years about the management of the Great Barrier Reef, mostly in relation to water quality and fisheries management, have led to a build-up of tension between the State and Commonwealth Governments.

In 1999, the Queensland Government commissioned a inquiry (known as the 'Sturgess Inquiry') into the relationship between the State and Commonwealth Governments in the management of the Great Barrier Reef Marine Park (Sturgess 1999). For the past two decades, cooperation between the State and Commonwealth Governments has been based on little more than a 'gentleman's agreement', known as the *Emerald Agreement*, signed in 1979 by the then Premier and Prime Minister. The agreement provided for day-to-day management of the marine park to be carried out by Queensland agencies. The inquiry report concluded that it is virtually impossible to disentangle the responsibilities of the two Governments, both in geographic and functional terms, and that they have no alternative but to better cooperate and work closely together in the management of the Great Barrier Reef. In today's circumstances, it is clear that the *Emerald Agreement* needs reviewing.

The report stated that in recent years, the Commonwealth Government has manifested a willingness to intervene more actively in areas traditionally left to the Queensland Government. The Commonwealth has signalled that it is prepared to rewrite the long-standing Memorandum of Understanding between the Commonwealth and State Governments over the responsibility for commercial fishing regulations in the marine park. The 1988 MOU on Fishing and Collecting within the Great Barrier Reef Marine Parks clearly distinguished GBRMPA's responsibility for managing the Marine Park, and QFMA's responsibility for managing fisheries. The inquiry report found that this MOU no longer reflected the current status of Commonwealth and State interests in relation to fishing within the Great Barrier Reef region.

In its 1998 Oceans Policy, the Commonwealth Government highlighted that it placed a high priority on improving the management and protection of the GBR through GBRMPA. Actions identified by the Government include:

- extend the area of the GBR Marine Park;
- increase surveillance and enforcement;
- make compulsory the use of bycatch reduction devices and turtle exclusion devices for the East Coast Otter Trawl Fishery; and
- complete a review of existing protection arrangements.

6.7.2.C Changes in management principles for the multiple-use Great Barrier Reef Marine Park and Great Barrier Reef World Heritage Area

There are a number of complex issues attached to the management of the GBR Marine Park, including jurisdictional issues, evolution in management practices for World Heritage Areas since the GBR was enlisted, the large size of the GBR and the importance of the area to the Queensland economy, and its historical development as a multiple-use MPA (Valentine *et al*. 1996, GBRMPA 1998).

In recent years, there has been a marked change in the implementation of WHAs worldwide, from simply creating a list of WHAs to placing greater emphasis on monitoring the environmental state of listed areas (Valentine *et al*. 1996). As a consequence, the management of the GBR Marine Park is being reviewed because of its status as a WHA.

Over 85% of WHAs in the world are managed as highly protected areas. However, this could not be possible for the GBR WHA because of its size (Valentine *et al* 1996). As noted earlier, about 93% of the GBR WHA is managed as a multiple-use marine park. Nonetheless, there are discrepancies between the multiple-use management philosophy of the GBR Marine Park and conservation imperatives of the World Heritage Area concept.

Following an audit of GBRMPA's performance conducted in 1996-97 by the Australian National Audit Office (ANAO Audit Report No 33), GBRMPA underwent a major re-structuring in mid-1998. The purpose of the restructuring was to provide a tighter focus on major critical issues and to improve reporting mechanisms (GBRMPA 1999). Four Critical Issues Groups were created:

- Tourism and Recreation;
- Conservation, Biodiversity and World Heritage;
- Fisheries; and
- Water Quality and Coastal Development.

This restructuring marked a new emphasis on fisheries-related issues within the GBR WHA. Today, GBRMPA claims that it recognises that the harvesting of fisheries resources is an important and reasonable use of the GBR Marine Park and consistent with the objectives of the GBR WHA. However, it also wants to make sure that fishing activities are ecologically sustainable and wants to address fishing impacts on target and by-catch species and on habitats (GBRMPA 1999). To achieve this, GBRMPA aims to strengthen its policy on fisheries by:

- stating more clearly its position on fishing in the GBR Marine Park;

- auditing the ecological sustainability of fishing in the GBR Marine Park in accordance with ESD principles; and
- incorporating a comprehensive system of protected areas which are free from fishing and are representative of the habitats within the GBRMPA (the Representative Areas Program, described below).

6.7.2.D The East Coast Trawl Plan

The development of the East Cost Trawl Plan was a show-case of GBRMPA's increased influence in fisheries management. After years of difficult negotiations between GBRMPA, the Queensland Government and the commercial fishing industry, the plan was finally agreed in January 2001. It included:

- trawl closures;
- mandatory use of bycatch reduction devices (BRDs) and turtle exclusion devices (TEDs);
- capping and reduction of fishing effort;
- detailed monitoring and recording of bycatch species; and
- introduction of vessel monitoring systems (VMS) for improved enforcement.

The reduction of fishing effort was the most controversial issue. The trawl fishery was in a situation where, if GBRMPA did not accredit the Trawl Plan as compatible with the objectives of the park, fishers would have to obtain annual fishing permits from GBRMPA to continue working in the GBR Marine Park (The Queensland Fisherman March 2000). GBRMPA accredited the Trawl Plan in September 2001.

An additional 20% of the GBR Marine Park will be closed to trawling (bringing to approximately 35% of the World Heritage Area now closed to trawling). The trawl closures are areas that, although previously open to trawling, have either not been trawled or only lightly trawled.

The plan includes a $20 million structural adjustment to offset the impact of effort capping and reduction, with the Commonwealth and State Governments contributing $10 million each. In addition, the Queensland Government will provide $10 million in concessional loans to fishers.

6.7.2.E The Representative Area Program (RAP)

At its creation, the GBR Marine Park was divided into four sections, with a zoning plan to be developed for each one. The sections were chosen more for administrative convenience than for conservation reasons and this created problems of inconsistent zoning. With its Representative Area Program (RAP), GBRMPA is currently undergoing a re-zoning of the park according to much more stringent conservation demands to meet the protection requirements of the GBR WHA and to contribute to the NRSMPA. The RAP aims to review the zoning of the entire GBR Marine Park to develop a network of no-take areas[12].

The RAP is described in 'An overview of the Great Barrier Reef Marine Park Authority Representative Areas Program' (GBRMPA 1999). The keys points of the program are:

- the principles underlying the development of a network of representative areas are adapted from the national guidelines (ANZECC TFMPA 1998);
- the process will involve:
  - classification and mapping of the biological diversity of the GBR Marine Park using the IMCRA bioregions; GBRMPA has also developed its own set of 71 bioregions at smaller scales;
  - review of threats and adequacy of existing highly protected areas;
  - identification of new candidate no-take areas;
  - selection of no-take areas for reservation (based on socio-economic considerations and the 'least cost principle', and on jurisdictional and practical considerations); computer-based map overlays will be developed, with input from the community, to assist with decision-making;
  - draft zoning plan for the whole of the GBR Marine Park; and
  - ministerial and parliamentary approval.

GBRMPA established a Scientific Steering Committee and a Socio-Economic & Cultural Steering Committee to assist with the RAP. It expects to submit new zoning plans of the GBR Marine Park for approval by Minister and Parliament by late 2002-early 2003.

GBRMPA's overview document states that public participation will be included in the RAP process, through (1) two formal public participation phases (one after the

[12] In Queensland both GBRMPA and the fishing industry call no-take areas 'MPAs'.

selection phase, and one after the draft zoning plan), and (2) continuous informal input from stakeholder groups and committees. The first round of formal participation was due to commence in June 2001, but no detail was provided on how it would be conducted in practice.

Following its restructure in 1998 and the establishment of four Critical Issue Groups, GBRMPA established a Reef Advisory Committee (RAC) for each of the four groups (GBRMPA 1999). GBRMPA also established eight Local Marine Advisory Committees (LMACs) in regional centres in 1999 to involve the community in the management of the GBR Marine Park. LMACs provide a forum for stakeholders' representatives to discuss marine resource management issues. At this stage, stakeholders (including commercial fishers) are uncertain as to whether this structure and approach are meeting their needs.

It is unclear how the two marine protected areas programmes established by the State and Commonwealth Governments relate to each other. At this stage, it is also unclear whether GBRMPA's RAP will be used to impose further are closures on the trawl fishing industry, in addition to the area closures included in the East Coast Trawl Management Plan.

6.7.2.F Science

GBRMPA relies largely on external Townsville-based marine science research agencies. A joint arrangement has been established with the Cooperative Research Centre (CRC Reef). GBRMPA also works with the Australian Institute of Marine Science, James Cook University and the CSIRO. Two major scientific projects have focused on the impact of the trawl and reef line fisheries. In 1998, the CSIRO and the Queensland Department of Primary Industries completed a five-year trawl study (Poiner *et al*. 1998). The CRC Reef (James Cook University) is carrying out a long-term study of the line fishery (the Effect of Line Fishing Experiment). The later study is conducted in collaboration with industry and involves alternatively closing and opening areas.

6.8 NORTHERN TERRITORY

6.8.1 Background

By comparison to other States in Australia, the natural environment of the Northern Territory is largely intact today. Because of low population level and limited development and use of the Northern Territory coastline, many areas have remained

in a near pristine condition. A total of 84% of the Northern Territory coastline is Aboriginal land down to low water mark (see www.nt.gov.au for details).

Ecological knowledge of the Northern Territory marine environment is limited compared to other regions in Australia (PWCNT 2000). The inaccessibility of the coastline, turbidity of the water and dangerous fauna make biological surveys difficult and expensive. The Parks and Wildlife Commission of the Northern Territory (the Commission) has recently prepared IMBRENT, an Interim Marine Biophysical Regionalisation for the Northern Territory, to provide an ecological framework for future marine conservation initiatives (PWCNT 2000).

There is only one marine park in the Northern Territory, the Cobourg Marine Park, declared under the *Territory Parks and Wildlife Conservation Act*. It is managed by a board established under the *Cobourg Peninsula Aboriginal Land, Sanctuary and Marine Park Act* (see below). There are also two Aquatic Reserves, Dr Gullies and East Point aquatic reserves, declared under the *Fisheries Act* and managed by the Department of Primary Industries and Fisheries (DPIF). Intertidal waters are very extended in the Northern Territory and are protected as part of existing State and Commonwealth terrestrial parks.

As in Western Australia, the Northern Territory appears to be under limited pressure from the Commonwealth to accelerate its development of MPAs. DPIF and the Commission applied for funding from EA MPA Program in 1999/2000 to assist with the development of a system of MPAs in the Territory, but they were unsuccessful. But it is clear that, when the zoning and management plan of the Cobourg Marine Park are finalised, government agencies will aim to develop a system of MPAs.

6.8.2 The Government policy on biodiversity conservation

The Parks and Wildlife Commission was created in 1995, with responsibilities to plan and develop the Territory's system of terrestrial and marine parks and reserves. In developing 'A Strategy for the Conservation of Marine Biodiversity in the Northern Territory of Australia' (PWCNT 2000), the Commission set up an interdepartmental working group to facilitate cross-jurisdictional input. The group includes, among others, representatives of fisheries management, mining, land planning, and transport.

The strategy aims to provide a broad framework for the conservation of marine biodiversity in the Northern Territory. The guiding principles are:

- information and involvement of the community and user groups;
- balance of conservation and socio-economic needs (multiple-use principle);

- maintain biodiversity by managing threats and preventing damage;
- ensure effective monitoring; and
- ensure cross-jurisdictional collaboration for effective integrated management of the marine environment.

With regards to MPAs, the strategy simply states that the Commission, in collaboration with other relevant government and non-government agencies, will work towards the development of a comprehensive, adequate and representative system of MPAs in accordance with the national guidelines for the establishment of the NRSMPA.

6.8.3 Cobourg Marine Park: integration of fisheries management and conservation

The Cobourg Marine Park consists of waters surrounding the terrestrial Gurig National Park; it occupies about 229 000 ha and falls into two bioregions of the Northern Territory.

6.8.3.A Conservation management plan

Although the park was declared in 1983, the development of a multiple-use zoning and management plan only began in 1999. The Commission prepared the management plan and also ensures its day-to-day management on behalf of, and subject to the directions of the Cobourg Peninsula Sanctuary and Marine Park Board (the Board). The Board was established under the *Cobourg Peninsula Aboriginal Land, Sanctuary and Marine Park Act 1981*. The purpose of the act is to acknowledge and secure the right of Aboriginals to occupy and use certain land on the Cobourg Peninsula, to vest that land in trustees for Aboriginals, to declare that land to be a national park, making certain provisions relating to the management of adjacent marine areas (see www.nt.gov.au/paw for details).

The Board consists of eight members appointed by the Minister for Conservation, four of them being members of the 'group' (the 'group' means the traditional Aboriginal owners of the peninsula) and nominated by the Northern Land Council. The functions of the Board include:

- to prepare plans of management for the control and management of the sanctuary and/or marine park;
- to protect and enforce the right of the group to use and occupy the sanctuary and/or marine park;

- to determine, in accordance with the plan of management, the rights of access to parts of the sanctuary and/or marine park of persons who are not members of the group; and
- to ensure adequate protection of sites on the sanctuary and marine park of spiritual or other importance in Aboriginal tradition.

6.8.3.B Fisheries management plan

In addition to the *Cobourg Peninsula Aboriginal Land, Sanctuary and Marine Park Act*, the *Fisheries Act* also has jurisdiction for aquatic resources within the boundaries of the park. The area within the Cobourg Marine Park was declared under section 22 of the Fisheries Act as the Cobourg Fishery Management Area on 6 October 1992 (Anon. 1999).

However, the establishment of the marine park under the *Territory Parks and Wildlife Conservation Act* also results in the automatic application of the Territory Parks and Wildlife Conservation By-Laws (see www.nt.gov.au/paw). The By-Laws regulate a wide range of activities, including fishing. The Commission's ability to control fishing through these By-Laws created tension between the Board and the Commission.

To help resolve this issue, the DPIF Fisheries Division and the Commission signed a Memorandum of Understanding in 1998 to better clarify their respective roles and responsibilities in the management of MPAs (Anon. 1999). It is generally agreed that, within an MPA, DPIF is responsible for the management of all fish and aquatic life as described under the *Fisheries Act*. The Commission is responsible for the management of birds, reptiles and mammals, and the protection of biodiversity and endangered species.

DPIF is preparing a fisheries management plan in tandem and in agreement with the Plan of Management for the Cobourg Marine Park being developed by The Commission (Anon. 1999). It is the first time in the Northern Territory that a marine park zoning and management plan are developed under the *Fisheries Act*. The commercial fishing industry sees it as a case study for future marine parks (Northern Territory Seafood Council News 2000).

DPIF established a Fisheries Management Areas Advisory Committee (FMAAC) to help resolve multiple-use issues in developing the fisheries management plan. The FMAAC is chaired by the Fisheries Director, and its membership includes representatives from commercial, recreational, and Aboriginal groups, the

Commission, fisheries managers, and conservation groups. The commercial fishing industry has four members on the committee.

According to available government documents, it appears that the FMAAC, in developing the management plan, has focussed primarily on multiple-use zoning issues and associated regulations, with little attention paid on monitoring needs. Nonetheless, it was generally recognised that the FMAAC had been successful in facilitating collaboration between stakeholder groups and achieving positive outcomes.

Table 1: Comparison between Australian jurisdictions of key features in governments' approaches to the development of MPAs.

	Western Australia	South Australia	Victoria	Tasmania	New South Wales	Queensland	Northern Territory	Commonwealth
NUMBER OF BIOREGIONS (CONTINENTAL SHELF)	18	8	5	8	5	14	13	?
SEQUENTIAL OR SIMULTANEOUS DECLARATION OF MPAs	Sequential	Simultaneous	Simultaneous	Simultaneous	Sequential by bioregion; simultaneous within a bioregion.	*State waters*: Simultaneous *GBR Marine Park*: Simultaneous for the entire marine park.	Sequential to date.	Sequential
CURRENTLY PROPOSED MARINE RESERVES	Jurien Bay Marine Park (Indicative Management Plan submitted for public comments). Three new candidate areas have been identified; three more are likely to be identified in near future.	Identification of a list of candidate areas is under-way.	The final Environment Conservation Council (ECC) proposal to create 13 highly protected Marine National Parks and 11 sanctuaries was accepted by the Victorian Government but withdrawn from Parliament in May 2001.	Identification of a list of candidate areas to begin soon. The processing of earlier proposals for the Port Davey /Bathurst Harbour and the Kent Islands Group is to be accelerated.	Identification of candidate areas is under-way.	*State waters*: Proposals for Eastern Cape York Peninsula and Trinity Inlet are under way; several candidate areas have also been suggested some time ago. *GBR Marine Park*: identification of candidate areas is under-way (results expected in late 2001).	A few areas have been proposed for marine parks over the years (eg. Beagle Gulf Marine Park); not yet part of a system of MPAs.	Heard Island and McDonald Islands Marine Reserve were proposed in early 2001. 27 new potential areas are under investigation.
AGENCIES RESPONSIBLE FOR MANAGING	Fisheries Western	Department of Primary	Fisheries Victoria, within the	Department of Primary	NSW Fisheries under the *Fisheries*	Queensland Fisheries Service, under the	Department of Primary Industries	Australian Fisheries Management

	Western Australia	South Australia	Victoria	Tasmania	New South Wales	Queensland	Northern Territory	Commonwealth
FISHERIES RESERVES, AND ASSOCIATED LEGISLATION	Australia, under the *Fish Resources Management Act 1994*.	Industries and Resources South Australia (PIRSA), under the *Fisheries Act 1982.*	Department of Natural Resources and Environment, and under the *Fisheries Act 1995*.	Industries, Water and Environment (DPIWE), under the *Living Marine Resources Management Act 1995.*	*Management Act 1994*.	*Fisheries Act 1994*.	and Fisheries, under *the Fisheries Act*.	Authority, under the *Fisheries Management Act 1991*.
AGENCIES RESPONSIBLE FOR THE IMPLEMENTATION AND MANAGEMENT OF MPAS, AND ASSOCIATED LEGISLATION	Department of Conservation and Land Management (CALM), under the *CALM Act 1984*, amended by the *Act Amendments (Marine Reserves) Acts) 1997*. WA legislation includes concurrence of Agreement between Ministers for	Department for Environment and Heritage (DEH), under the *National Parks and Wildlife Act 1972*); with assistance from PIRSA Marine Habitat Program, under the *Fisheries Act 1982*.	Development of MPA proposals by the ECC (disbanded in 2000). Management of MPAs to be the responsibility of National Parks, Fauna and Flora within the Department of Natural Resources and Environment, under the *National Parks Act 1975*.	Development of MPA proposals to be undertaken by the Resource Planning and Development Commission (RPDC). MPAs to be declared jointly under the *National Parks and Wildlife Act 1970* and the *Living Marine Resources Management Act 1995.*	Development of MPA proposals to be undertaken by National Parks and Wildlife Service and NSW Fisheries. The Marine Parks Authority role is to facilitate their cooperation. MPAs can be declared under the *Marine Parks Act 1997* or the *Fisheries Management Act 1994*, and management responsibilities remain with the relevant agency.	*State waters*: Queensland Parks and Wildlife Service, under the *Marine Park Act 1982*. *GBR Marine Park*: GBRMPA (statutory authority), under the *Great Barrier Reef Marine Park Act 1975*.	Parks and Wildlife Commission of the Northern Territory, under the *Territory Parks and Wildlife Conservation Act*. Cobourg Marine Park: management plan developed under the *Cobourg Peninsula Aboriginal Land, Sanctuary and Marine Park Act*, the *Territory Parks and Wildlife*	Environment Australia (Marine and Water Division) and National Parks, under the *Environment Protection and biodiversity Conservation Act 1999.*

	Western Australia	South Australia	Victoria	Tasmania	New South Wales	Queensland	Northern Territory	Commonwealth
	the Environment, Mines, Fisheries. Compensation act: *Fishing and Related Industries Compensation (Marine Reserves) Act 1997*.			Management of MPAs to be the responsibility of National Parks and Wildlife Service and Marine Resources Division, both within DPIWE.			*Conservation By-Laws*, and the *Fisheries Act*. The area of the Cobourg Marine Park was declared as a fishery management area under section 22 of the Fisheries Act.	
GOVERNMENTS' MPA POLICIES	New Horizons – The way ahead in marine conservation and management (1998).	Our Seas and Coasts. A Marine and Estuarine Strategy for South Australia (1998).	The Victorian Coastal Strategy (1997, under review).	Tasmanian Marine Protected Areas Strategy (2001).	Draft Framework for Establishing a System of Marine Protected Areas in NSW (2000, under review).	*State waters*: Marine Protected Areas in Queensland – A Draft Framework (May 2000, under review). *GBR Marine Park*: An Overview of the Great Barrier Reef Marine Park Authority Representative Program (May 1999).	A Strategy for the Conservation of Marine Biodiversity in the Northern Territory of Australia (Draft, February 2000); not an MPA-specific policy.	*Guidelines for Establishing the National Representative System of Marine Protected Areas (1998).* Strategic Plan of Action for the National Representative System of Marine Protected Areas (1999).
Umbrella Authority	Marine Parks and Reserves	None	None	None	Marine Parks Authority.	*State waters*: None	A Board was created for the	None

	Western Australia	South Australia	Victoria	Tasmania	New South Wales	Queensland	Northern Territory	Commonwealth
	Authority.					*GBR Marine Park*: GBRMPA	Cobourg Marine Park.	
Scientific Advisory Committee	Marine Parks and Reserves Scientific Advisory Committee.	None	None	Not specified.	Marine Parks Research Committee.	*State waters:* not specified. *GBR Marine Park*: Scientific Steering Committee.	?	None
Statutory consultation (prior to declaration of MPAs)	Includes two components: • community based Advisory Committees appointed by Minister. • Statutory three-month period for public comments.	Unclear. The Marine and Estuarine Strategy includes "reviewing arrangements for community and industry input"	Statutory periods for public comments.	Statutory periods for public comments.	Statutory periods for public comments.	*State waters*: Not mentioned. *GBR Marine Park*: Two stages of 'formal public participation', but not a statutory requirement.	Not applicable (not an MPA-specific policy), but government agencies have demonstrated a commitment to consultation (eg. Cobourg Marine Park).	One statutory period for public comments; also mention of informal consultation with other government agencies and stakeholder groups (no details).
Stakeholders Advisory Committee	Advisory Committee created for each park, appointed by Minister.	Task Force on MPAs, appointed by DEH.	Advisory Group, formed by the ECC.	Not specified.	State-wide Marine Parks Advisory Council and Advisory committees for each MPA, appointed by the Ministers for Environment and	*State waters*: Not mentioned. *GBR Marine Park*: Reef Advisory Committees (RACs) and Local Marine Advisory committees	Not applicable (not an MPA-specific policy). A Fisheries Management Area Advisory Committee was	Not specified.

	Western Australia	South Australia	Victoria	Tasmania	New South Wales	Queensland	Northern Territory	Commonwealth
					Fisheries.	(LMACs), appointed by GBRMPA.	created during the Cobourg negotiations.	
Reference to ESD principles	Yes	Yes	Yes	Yes	Not clear	*State waters* and *GBR Marine Park*: Yes	Yes	Yes
Reference to fisheries benefits from MPAs	No	No	Some	No	No	*State waters* and *GBR Marine Park*: Yes	Not applicable (not an MPA-specific policy).	Yes (as part of selection criteria).
Statements in governments' MPA policies about MPA impacts on commercial fisheries, and compensation to fishers	"If the commercial value of an authorisation for commercial fishing, aquaculture and pearling is apparently diminished by the establishment of a marine reserve, then the holder of the authorisation will be eligible to apply for compensation"	"Consultation must cover financial implications for potentially displaced activities"	Not specified.	"The Tasmanian Government recognises the importance of displacement issues…has agreed to establish a process for providing special adjustment payments on a case by case basis to certain individuals directly affected by a Marine Protected Area"*	Not mentioned.	*State waters*: mentioned. *GBR Marine Park*: Recognition of potential impacts to be minimised through using the 'least cost' principle.	Not applicable (not an MPA-specific policy).	National guidelines state that displacement and compensation are to be considered by each jurisdiction. The Commonwealth believes that there is no legal ground to pay compensation.
Network approach	Yes	Yes. MPA	Yes	Yes.	Yes. MPA system	*State waters* and *GBR*	Yes.	Yes

	Western Australia	South Australia	Victoria	Tasmania	New South Wales	Queensland	Northern Territory	Commonwealth
to development of MPAs		system is to be developed by 2003.			is to be developed by 2005.	*Marine Park*: Yes		
Use of no-take areas within multiple-use areas	Yes	Yes	In the ECC final report, all proposed areas were 'no-take' areas; the remaining of State waters was to be declared as one multiple-use reserve.	Yes	Yes	*State waters* and *GBR Marine Park*: yes.	Not specified but most likely.	Yes
Reference to a target percentage of waters to be reserved	Not clear.	Not clear.	Not explicit. But repeated claims by the ECC that current percentage of State waters being protected is insufficient.	Not clear.	Not clear.	*State waters*: Not clear. *GBR Marine Park*: Clearly states that no target is being used.	Not applicable (not an MPA-specific policy).	No
Assessment of the value of existing fisheries reserves for inclusion in MPA networks	No. Fisheries reserves and MPAs cannot co-exist in the same location.	No	No. But the ECC did review the status of existing reserves.	Yes	Yes. 22 candidate Aquatic Reserves have been proposed by NSW Fisheries; will be part of the NSW system of MPAs.	*State waters*: Yes *GBR Marine Park*: not clear.	Not applicable (not an MPA-specific policy).	No. The national guidelines state that areas established to protect fish habitats are not included in the NRSMPA.
Timing of declaration and management (zoning) plan	Interim Management Plans (including	Management plans to be designed after declaration.	Management plans to be designed after declaration.	Management plans to be designed after declaration.	Management plans to be designed after declaration.	*State waters*: Management plans to be designed after declaration.	Management plan for the Cobourg Marine Park was designed after its	Management plans being designed after declaration.

	Western Australia	South Australia	Victoria	Tasmania	New South Wales	Queensland	Northern Territory	Commonwealth
	estimates of management costs) to be designed prior to declaration for each MPA.					*GBR Marine Park*: the Representative Areas Program is a re-zoning program.	declaration.	
SCIENTIFIC INFORMATION USED								
Ecosystem/habitat identification; initial identification of priority areas for reservation	1994 'Wilson Report' identifying 70 high priority areas.	1999 SARDI Research Report identifying 27 high priority areas.	NRE Environmental Inventory of Victoria's Ecosystems.	Various ecological studies undertaken over the last 10 years have identified several priority areas.	Available information from various sources.	*State waters* and *GBR Marine Park*: Available information from various sources.	Available information from various sources.	Available information from various sources.
Methods used to identify candidate areas for MPAs	Experts' best guess.	Experts' best guess.	Experts' best guess.	Has not began yet.	Systematic, computerised methods.	*State waters*: Experts' best guess (?) *GBR Marine Park*: Systematic, computerised methods.	Experts' best guess.	Experts' best guess.
CONCLUDING COMMENTS	• The legislative framework was adapted to facilitate MPA	• The Government MPA strategy recognised the need to "review the	• No specific MPA legislation. • The ECC investigation closely followed national	• No specific MPA legislation; MPAs to be declared using	• MPA specific legislation exists. • The ongoing identification of candidate areas closely follows	• *State waters*: MPA specific legislation exists. Government MPA policy lacks clear objectives and	• No MPA-specific government policy or legislation. • The zoning	• Under the EPBC Act, the assignment of IUCN categories defines the objectives and

	Western Australia	South Australia	Victoria	Tasmania	New South Wales	Queensland	Northern Territory	Commonwealth
	development. • The revised Government's MPA planning process was successfully road tested with the Jurien Bay Marine Park. • CALM seems to have adequate number of specialised staff. • CALM is actively engaged in non-statutory consultation with stakeholders.	legislative framework for provision of MPAs in South Australia". • DEH investigation closely follows national guidelines. • Process still at identification stage. • Financial assistance from EA. • Limited resources and very short timeframe (1 year initially) to propose a list of MPAs (including industry and community consultation).	guidelines. • Investigation took nine years, involved various agencies, and was supported by EA financial assistance. • The ECC final recommendations were rejected by Parliament because of compensation issues.	existing conservation and fisheries acts jointly. • The RPDC is expected to closely follow national guidelines. • The MPA development has been partly assisted financially by EA.	national guidelines. • Process partly assisted financially by EA. • Other pressing issues besides MPAs are currently affecting the commercial fishing industry.	planning process. • *GBR Marine Park*: MPA specific legislation exists. Development of MPAs (ie. no-take here) driven by greater emphasis on the World Heritage values of the GBR region.	process for the Cobourg Marine Park was apparently a success due to stakeholders' satisfaction with consultation practices.	management principles of MPAs and their zones.

* However, adjustment payments, and the process to provide them, would only be considered and worked out after MPAs have been declared.

7 MPAs AS TOOLS FOR FISHERIES MANAGEMENT, BIODIVERSITY CONSERVATION OR BOTH

This is possibly one of the issues that generate most confusion in the MPA debate between conservation agencies, the commercial fishing industry and the community. It directly influences the fishing industry's understanding of, and response to the objectives of MPAs. There is little discussion on this issue in Australia by comparison to many countries overseas where MPAs are increasingly viewed as part of fisheries management.

The Bureau of Rural Sciences and CSIRO undertook an extensive review of the scientific literature on the effectiveness of marine fisheries reserves (Ward *et al*. 2001). The review focused on the effectiveness of marine sanctuaries/no-take areas that had been established specifically for fisheries management purposes. This study is of particular relevance to the present project and its findings are summarised below.

Following the summary of the BRS-CSIRO review, some key issues regarding the role of MPAs for biodiversity and/or fisheries management are discussed.

7.1 SUMMARY OF THE BRS-CSIRO SCIENTIFIC REVIEW

As in the case of the Commonwealth documents summarised in chapter 5, the summary of the BRS-CSIRO report below does not necessarily reflect the opinion of the authors of the present FRDC report. The structure and headings of the BRS-CSIRO report have been kept.

INTRODUCTION

Existing marine reserves have been created for a broad range of reasons, including the protection of icon species and habitats (eg. dugongs, coral reefs), of spawning or nursery grounds of harvested species (eg. seagrass meadows, coral reef flats, mangroves), of areas of importance for recreation and tourism (eg. coral reefs), and of places of cultural heritage value (eg. shipwrecks).

Marine reserves specifically designed for use in fisheries management are often referred to as Marine Fishery Reserves (MFRs). Marine reserves primarily dedicated to biodiversity conservation are usually referred to as Marine Protected Areas (MPAs).

The BRS-CSIRO report focuses on no-take marine reserves (or sanctuaries) for fisheries management purposes (referred to as Marine Fisheries Reserves – MFRs), where fishing is banned. The objective is to document potential and realised benefits for fisheries, to identify key gaps in knowledge, and to outline future directions that may be of benefit to fisheries managers as they consider the potential of MFRs in Australia.

The knowledge about how useful MFRs are for fisheries management is limited because of the small number of no-take areas worldwide. Experience with marine reserves for fisheries management purposes is also limited in Australia. In many countries, particularly those in the tropics, the capacity to manage and enforce declared MFRs is often limited, which further adds to the uncertainty about their effectiveness.

FISHERIES MANAGEMENT AND MARINE RESERVES

Area and seasonal closures have long been used by fisheries agencies as part of fisheries management. MFRs have been mostly established to assist the recovery of severely overfished or depleted stocks, and for the protection of near-shore nursery areas where there are imminent threats.

However, the authors note that area closures are not a primary tool for fisheries management, which has traditionally relied on other forms of input control (eg. gear restriction) and more recently output controls (eg. quota). In recent years, the over-exploitation and crashes of many fisheries worldwide and the impact of fishing on habitats have alerted fisheries managers of the weaknesses in the ways these traditional fisheries management tools have been used.

The major scientific problems with traditional fisheries management are:

- our inadequate understanding of most natural and human systems, and the lack of, or inaccuracy in, the data needed to represent these systems;
- the difficulty to mathematically represent complex natural systems to make accurate predictions;
- the inadequacy of single-species models in dealing with multi-species and ecosystem problems; and
- the lack of adequate control sites for testing scientific hypotheses.

The effective application of traditional fisheries controls, especially output controls, relies on detailed knowledge of stock dynamics and fisheries behaviour. That

knowledge is built and relies on large data sets. Inadequacies and uncertainties in these data sets, as well as in their use and interpretation, have often been cited as contributing to fisheries management failures. Several studies have argued that implementing marine reserves as a management control does not require such data and knowledge. Against this view however, it has been stressed that achieving the potential benefits of marine reserves requires their configuration (eg. size, shape, location and number) to be right and this requires substantial amounts of information.

The problem faced by fisheries and the associated marine environment is often attributed to the lack of precautionary approach in traditional fisheries management systems. This has created an imperative to develop innovative, ecosystem-based and precautionary fisheries management approaches, and no-take reserves are often seen as the right approach when faced with the management of over-exploited fish stocks. No-take reserves are seen as a way to reduce the probability of fisheries collapse through 'bet-hedging' (a technique developed in economic fields to cope with uncertainty and lack of knowledge).

Also, traditional fisheries management techniques have been mostly developed for single-species stocks in temperate regions. In reality, many fisheries in the world, and particularly in the tropics, are multi-species and multi-gear fisheries and these management techniques are not applicable. Again, no-take marine reserves are seen as a potential solution for these fisheries.

So far, marine fisheries sanctuaries have been mostly established in crisis situations to help over-exploited stock recover. Recently, however, there has been growing interest in using marine reserves to provide broader support for conventional fisheries management. This is in recognition that fisheries sustainability is being threatened by the loss of 'de facto reserves' (natural refugia, ie. grounds that were initially not accessible to fishing but which are becoming accessible through improvements in fishing technology).

Most proposals to use MFRs to achieve sustainable use of fisheries resources suggest protecting a proportion of the area occupied by the stock and allowing fishing in the remainder. However, modelling studies have led to widely different proportions to achieve long-term sustainability, ranging from 20 to 50%, or even more. This is a much debated issue at the moment. More recent approaches to the issue of reserve size adopt a more flexible approach, indicating that set percentages are difficult to justify on ecological or fisheries grounds, and that reserves are perhaps best designed to be a network.

POTENTIAL BENEFITS OF NO-TAKE MFRS TO FISHERIES

The authors put together a long list of potential benefits of marine fisheries sanctuaries for exploited species and the fisheries that depend on them, distinguishing three categories of benefits: inside sanctuaries, outside sanctuaries, and general benefits.

BENEFITS INSIDE SANCTUARIES

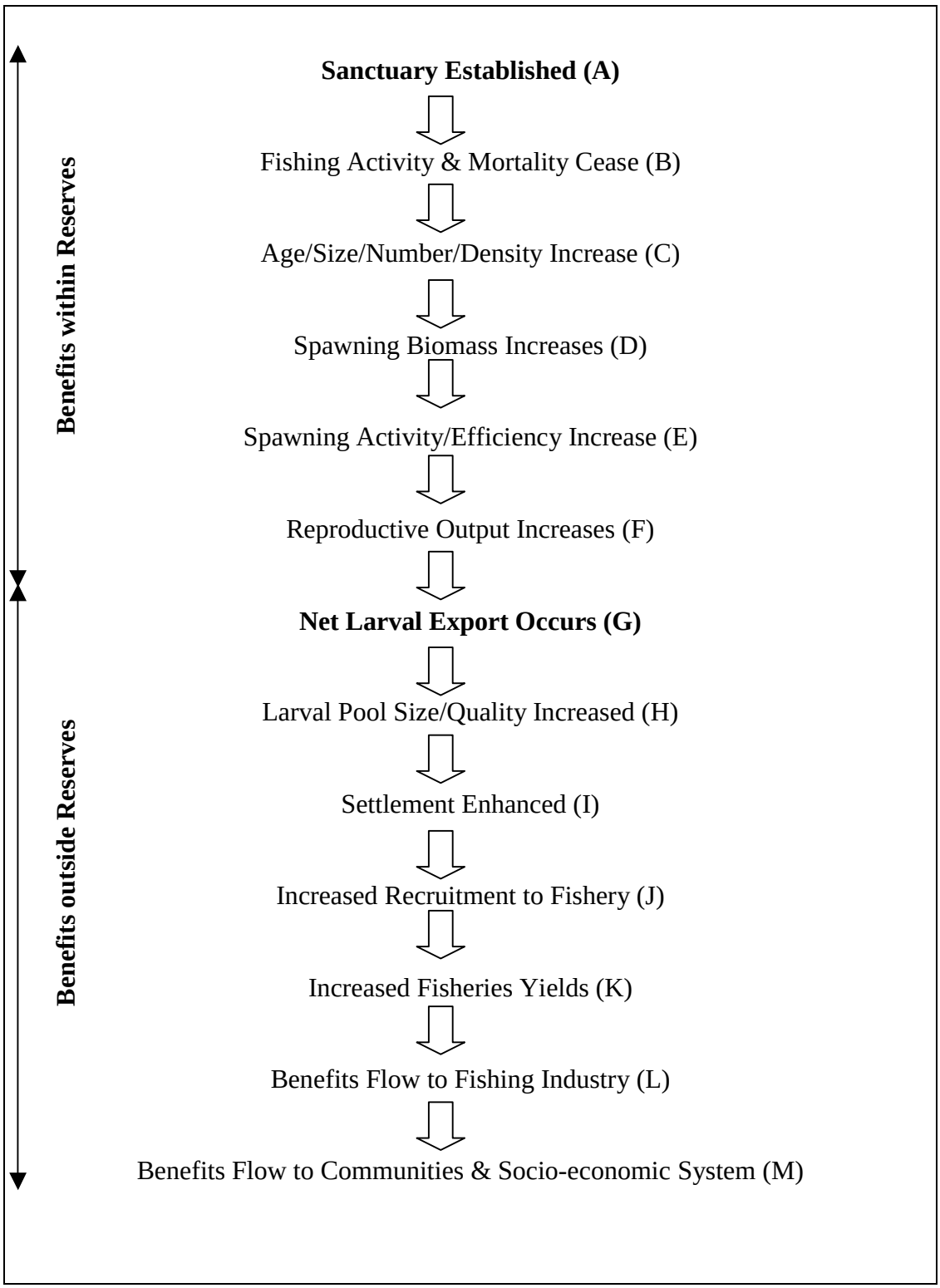
- Zero fishing mortality for commercial species;
- Zero fishing mortality for by-catch species (commercial and non-commercial);
- Increase in fish abundance and spawning biomass;
- Increase in mean age and size;
- Improved reproductive potential; and
- Improved habitat quality.

BENEFITS OUTSIDE SANCTUARIES

There are two essential biological processes by which benefits inside sanctuaries could translate into benefits outside sanctuaries:

- larval export; and
- spillover (export of juveniles and adults).

The authors present a summarized pathway (reproduced below) illustrating the steps involved from the establishment of a sanctuary to larval export from that sanctuary (A-G), and from larval export to several aspects of fisheries enhancement (G-M).


Benefits within Reserves
Sanctuary Established (A)
Fishing Activity & Mortality Cease (B)
Age/Size/Number/Density Increase (C)
Spawning Biomass Increases (D)
Spawning Activity/Efficiency Increase (E)
Reproductive Output Increases (F)
Net Larval Export Occurs (G)
Benefits outside Reserves
Larval Pool Size/Quality Increased (H)
Settlement Enhanced (I)
Increased Recruitment to Fishery (J)
Increased Fisheries Yields (K)
Benefits Flow to Fishing Industry (L)
Benefits Flow to Communities & Socio-economic System (M)

These two mechanisms are believed to increase stability in fisheries yields in the medium to long terms. Benefits from larval export will not apply in the case of pelagic, migratory or highly mobile species, or in the case of species with locally restricted larval dispersal. The beneficial effects of spillover are believed to be much less important than the effects of larval dispersal. Spillover will be minimal for sedentary species and will operate only locally, ie. just outside the reserve boundaries (potentially creating problem with excessive concentration of fishing effort on these boundaries). While there is considerable evidence that fish abundance increases inside reserves, there is limited evidence to demonstrate that the spillover of these fish into fishing grounds is consequent enough to improve fisheries sustainability.

Larval export is believed to be the most significant effect but is also the most difficult to demonstrate. The most important question with larval export is whether an increase in the number of larvae will lead to an increase in the rate of settlement and subsequent processes benefiting fisheries. At the core of this question is the uncertainty about stock-recruitment relationships (which is often assumed to be density-dependent, meaning that benefits are more likely to be realised at low stock level).

GENERAL BENEFITS

- Increase size of whole stocks;
- Protect genetic diversity;
- Reduce risk of disruption of ecosystem structure and function;
- Benefit management, science and the community;
- Simplify management regulations making compliance enforcement easier;
- Provide control reference sites where scientific knowledge can be improved;
- Reduce data requirement for management;
- Protect against management failure (precautionary approach);
- Reduce conflict amongst users; and
- Improve opportunities for education and tourism.

There are good reasons to expect that environments damaged by fishing will improve when protected, although the authors point out that accurately predicting the form and extent of improvement will be difficult. For fisheries management based on no-take marine reserves to be most effective, marine areas need to be carefully selected and properly designed to ensure that they deliver the benefits listed above. Benefits from spillover and larval dispersal will be more obvious for species that have been

overfished, and which life-history characteristics make them susceptible to benefit from spatial closure to fishing.

They found that, while there is reasonable evidence of improvement inside reserves, there is virtually no empirical evidence for the key benefits outside reserves (spillover, larval export, stability of fisheries production). Evidence for the potential benefits from empirical studies, modelling analyses and theoretical treatments varies from strong (eg. increase in size and abundance of fish in reserves), to moderate (increase in reproductive potential inside reserves), to weak or non-existent (eg. stabilisation of fisheries yields outside reserves). The authors conclude that, to a large extent, convincing stakeholders of the potential of marine reserves to enhance fisheries depends on theoretical and logical arguments based on our basic knowledge of marine ecology.

The authors state that, nonetheless, in the face of the difficulties experienced by conventional fisheries management, there is a growing perception that the list of potential benefits from no-take areas is sufficient justification in itself for a wide ranging implementation of no-take areas, as part of integrated management of marine ecosystems and resources.

EMPIRICAL EVIDENCE FOR BENEFITS WITHIN SANCTUARIES

There are few well documented examples of the application of marine sanctuaries in fisheries systems. Moreover, studies of marine reserves have concentrated almost entirely on reef systems and other high topographic-relief habitats such as rocky substrates. Much less is known on the effect of marine reserves on other ecosystems (continental shelf, open oceans).

Changes in abundance of focal species inside a marine reserve are the most obvious and detectable benefits from a reserve. The majority of studies into abundance have concentrated on coral reef predatory fish, which are the major target fish in many tropical fisheries and the most severely affected by fishing (large predatory fish are slow growing, have low reproductive rate and are generally territorial, reducing their resilience to fishing impact).

EVIDENCE FOR BENEFITS OUTSIDE SANCTUARIES

The authors found that, at present, much of the evidence that is used to advocate the use of reserves for fisheries management is largely theoretical and circumstantial,

both because of the newness of the topic and because of the difficulties involved in measuring spillover and larval dispersal. Experiences of concrete benefits to fisheries are often limited to either the recovery of highly depleted stocks, or involve mainly subsistence-scale tropical reef fisheries. These experiences cannot be related directly to the world's commercial fisheries and there is little documented evidence that in a well managed fishery no-take areas offer additional advantages. Indeed, a few fisheries scientists argue that problems with classical management tools can be overcome with modern risk management procedures.

LIMITATIONS WITH STUDIES OF MARINE SANCTUARY BENEFITS

Sampling sanctuaries is a very labour intensive and time consuming exercise. Financial resources are often limited, causing interpretation problems. There are a number of problems associated with studying, quantifying and evaluating the benefits of marine sanctuaries. These fall into three basic categories: methodological, ecological and management.

METHODOLOGICAL PROBLEMS

Sampling design is crucial to the proper evaluation of marine reserve performance. Weak design results in the effect of variables being confounded and conclusions uncertain and difficult to extrapolate to other areas. Very few studies are designed as 'before and after' comparisons (BACI comparison, 'Before and After Control and Impact'), which would provide the most convincing evidence of reserve effect. Few studies have reported pre-establishment information on sanctuaries being studied (eg. baseline biological and fisheries data).

Also, the choice of biological variables being measured may affect whether the study will detect a benefit of protection. Making precise and accurate measurements of variables that are not likely to translate into fisheries benefits is counter-productive. Most studies focus on changes in abundance or size of fish, few documenting changes in reproductive output. Many studies are also limited to snapshot studies with little interpretative value.

There are added complications with sampling in marine reserves due, at least in part, to restrictions to non-destructive sampling methods. Visual census using scuba diving is the most commonly used sampling method, but it has its problems. For example, the presence of scuba divers affects the fish during census counts and may lead to over- or under-estimation depending on fish behaviour.

ECOLOGICAL ISSUES

The long natural life spans and the diversity of reproductive strategies amongst dominant marine species make assessments of the effectiveness of marine sanctuaries difficult. The dispersal characteristics of species may also confound assessment of sanctuary effect. The spatial scale of larval and adult dispersal in relation to the size of no-take areas is not always known.

Large-scale oceanographic events have the potential to affect the effectiveness of sanctuaries, but these are poorly understood. Changes in predator-prey interactions and trophic competition (eg. increased predation on juvenile fish inside reserves) also confound studies of fish abundance and community structure.

MANAGEMENT PROBLEMS

Potential benefits to fisheries will be partly dependent on compliance with no-take regulations. Modelling and empirical experience has shown that a relatively low level of illegal fishing is enough for MFRs to fail. However, few sanctuaries are comprehensively monitored to ascertain the level of compliance.

IMPORTANCE OF THE DESIGN OF MARINE RESERVES

The authors stress that the location, size and shape of MFRs are crucial to their effectiveness in delivering spillover and larval export benefits to fisheries. For example, the collapse of an abalone population (*Haliotus laevigata*) in South Australia has been attributed to poor sanctuary design relative to the species recruitment strategy. In another study in Tasmania, bastard trumpeter (*Latridopsis forsteri*) increased tenfold inside the reserve, but failed to spillover to adjacent fishing grounds because of sandy beaches which acted as natural barriers and kept the fish confined to specific rocky headlands.

Scientific opinion differs about optimum size, shape and design of sanctuaries, and on whether it is better to have a single large marine reserve or several small ones. Generally speaking, networks of smaller sanctuaries seem to be preferred than few large sanctuaries. As a compromise between the needs for both conservation and resource exploitation, the authors note that the approach often adopted is to locate small cores of highly protected areas (no-take areas) within larger, less protected areas (multiple-use areas).

Important factors to be considered in the design of marine reserves include edge effects (eg. the biological benefits of marine reserves may be offset by the high concentration of fishing effort just outside the reserve), minimum viable size, dispersal properties, and oceanic conditions. Spillover mechanisms are density dependent and thus are affected by the size of reserves and by the perimeter:area ratio. Networks of small co-located reserves have greater perimeter:area ratios that could maximise the benefit of spillover or larval export to fisheries.

EVALUATION OF THE EFFECTIVENESS OF FISHERIES RESERVES

The authors stress that the effectiveness of reserves needs to be assessed in a comprehensive manner as poor performance may be overlooked by a false sense of security. They have compiled an exhaustive list of criteria and indicators to evaluate the benefits of no-take fisheries reserves both for fisheries and non-fisheries interests (Appendix 9). Criteria are broad statements used to guide decisions, and indicators are variables used to quantify them. Criteria and indicators can be weighted as required for different purposes. The indicators can also have target levels (reference points). Not all the criteria and indicators shown in Appendix 9 will apply to all reserves or in all circumstances.

IMPLICATIONS FOR MANAGEMENT

The positive effects of marine sanctuaries are lost if the surrounding area is not managed effectively. Therefore conventional fisheries management should continue to apply outside the reserve after adjustment to ensure that the reserve effect is taken into account (eg. when setting quotas).

A collaborative management approach is necessary in the development of reserves, with governments, scientists, fishers, conservationists, community groups and resource agencies working together.

CONCLUSIONS

DO SANCTUARIES HELP WITH FISHERIES MANAGEMENT ISSUES?

The authors conclude that several case studies document increases in yield to fisheries as a result of sanctuary declaration. However, there are no well-documented examples where fisheries sanctuaries have been shown to also provide or maintain net economic benefits for previously existing fisheries. Net benefit is important in the

situation where fishing effort is to be reduced or displaced to accommodate sanctuaries.

There are arguments and some ecological evidence that suggest that marine sanctuaries could maintain, and possibly improve, fisheries economic benefits. These benefits however will be achieved in only some fisheries, including:

- overfished fisheries, or on the steep part of the stock/recruitment curve;
- fisheries exploiting high trophic level, large, highly valued species, or
- fisheries that impact heavily on ecological communities or habitats.

The success of marine sanctuaries also depends on local environmental conditions, including oceanographical regimes, and the level of support by fishers and local communities.

Marine fisheries sanctuaries could assist traditional fisheries management in adopting a more precautionary approach and, thus, make a considerable contribution to regional conservation goals for marine ecosystems.

WHAT ARE THE NON-FISHERY BENEFITS OF FISHERIES SANCTUARIES?

Fisheries sanctuaries contribute to the protection of the ecosystem by reducing by-catch of non-commercial species and habitat damage by fishing gear. Thus, marine reserves declared primarily for fisheries management purposes contribute to some conservation objectives. Fisheries sanctuaries are also likely to offer a range of economic benefits for local communities through tourism and recreation.

GAPS IN THE EVIDENCE

To optimise the success of fisheries sanctuaries, the authors identified several areas where more knowledge is needed:

- detailed understanding of stock-recruitment relationship for focal species;
- knowledge of the ecological processes that underpin larval export and spillover;
- extent to which fisheries sanctuaries reduce the risk of fisheries collapse caused by environmental stresses, failure of fisheries management, or mis-management of the fishery;
- evidence of benefits for Australian fisheries from establishing a network of fisheries sanctuaries;
- procedures and models for establishing fisheries sanctuaries taking into account a range of stakeholders interests; and

- fishers' response to the design and establishment of fisheries sanctuaries intended to assist with the management of their fisheries.

THE FUTURE

The authors highlights that fisheries sanctuaries may have many theoretical benefits for fisheries, but they are still poorly documented. They conclude that the major challenge is to identify specific approaches and design methodologies that will ensure that these sanctuaries achieve expected benefits. They also point out that the development of networks of fisheries sanctuaries could be an opportunity for the fishing industry to demonstrate its leadership role in marine conservation, and confirm its commitment to ecologically sustainable development and precautionary principles.

7.2 FISHERIES MANAGEMENT PRINCIPLES IN AUSTRALIA

Over the last decade, fisheries management in Australia has undergone significant changes. In particular, there is greater recognition of the need to protect the environment and the ecosystems on which fisheries depend. The principles of ecologically sustainable development (ESD) and precautionary management are progressively integrated in fisheries legislation. However, Leadbitter *et al*. (1999) pointed out that, until recently, fisheries agencies were applying these principles to the management of targeted fish resources rather than to the management of ecosystems. They also discussed the challenges that fisheries agencies face in implementing these principles.

Sainsbury *et al*. (1998) undertook a review and gap analysis of the status and development of sustainability indicators in fisheries research and management agencies across Australia. Later, in 1999, fisheries management agencies across Australia embarked upon a major collaborative project to develop a national reporting framework to demonstrate the performance of Australian fisheries with respect to ESD objectives (Chesson *et al*. 2000). The project is coordinated by the Standing Committee on Fisheries and Aquaculture (SCFA) and is due to finish in late 2001. Also, in May 2001, AFMA launched a series of Bycatch Action Plans for major Commonwealth fisheries. These plans, which were developed jointly by the fishing industry and government, illustrate the commercial fishing industry's increased focus on ecosystem management (AFMA News May 2001).

Fisheries research priorities are also being reviewed to better incorporate ESD principles and ecosystem considerations (Hall 1999, Commonwealth Government

1999, FRDC 2000). A four-year FRDC-funded review of fisheries habitats was undertaken between 1994 and 1998 to identify gaps in current knowledge and requirements for research and development (Cappo *et al*. 1998). The investigation involved more than 160 scientists representing many Commonwealth and State agencies.

Generally speaking, fisheries management in Australia is evolving from a system of essentially input-based controls (eg. gear control, spatial management) to increased use of output-based control (eg. catch and/or fishing time quota allocations). This is supported by the implementation of other mechanisms, such as co-management and partnership approaches, allocation of fishing rights, cost recovery of management and research and, in some fisheries, data collection by industry. The granting of fishing rights is viewed as a means to provide fishers and financial institutions with greater security of access to resources, and thus to promote financial investment and development, while also promoting long term stewardship of the resources.

7.3 DIFFICULTIES IN INTEGRATING FISHERIES MANAGEMENT AND BIODIVERSITY CONSERVATION IN AUSTRALIA

The Australian Oceans Policy stresses that to successfully achieve ecosystem-based management of marine resources requires the integration of the sectoral management systems currently used to control human activities. However, and at least in the case of the commercial fishing industry, there are inconsistencies in the principles and legislation underlying the approaches used in biodiversity conservation and fisheries management. This significantly hampers the integration of the objectives and policies of conservation and fisheries agencies and, importantly, the coordinated implementation of these policies.

7.3.1 Ecosystem versus single issue approaches

The first difficulty relates to the fact that conservation legislation focuses on developing an ecosystem-based management approach. Fisheries management approach to conservation needs has traditionally been more concerned with single-species or single issues, eg. by-catch reduction, protection of target species spawning sites, etc. There is an inherent incompatibility between fisheries and conservation approaches to marine resource management using spatial closures. When used for fisheries management purposes, spatial closures are most effective if designed to benefit a limited number of target species (ie. tailored to species biological characteristics and needs, see Ward *et al*. 2001). Whereas, when used for biodiversity purposes, the design of MPAs is based on an ecosystem/habitat approach and relies on

principles such as representativeness (as shown in the government documents summarised in chapter 5).

Also, by relying primarily on spatial management (ie. input type of management), current approaches to biodiversity conservation tend to interfere with growing trends in Australian fisheries management relying on output management mechanisms. However, and as discussed earlier, the ecosystem approach is also now becoming an important component of Australian fisheries legislation.

7.3.2 Inappropriate conservation messages versus lack of input from fisheries managers and scientists

As seen in the previous chapter, State and Commonwealth government conservation policies clearly define the primary goal of MPAs as biodiversity conservation, and not fisheries management. However at the same time, the development of MPAs is actively promoted on the two-fold belief that (1) traditional fisheries management is failing (Ludwig *et al*. 1993, FAO 1995, Bohnsack and Ault 1996, Dayton 1998, Guenette *et al*. 1998, Pauly *et al*. 1998, NRC 1999, Parrish *et al*. 2000), and (2) MPAs will benefit fisheries[13], including providing protection against stock collapse (eg. Robert and Hawkins 2000, Ward *et al*. 2001).

In its draft management plan for the Ningaloo Marine Park (Commonwealth Government 2000), Environment Australia describes the little developed commercial longline fishery as a 'major potential threat' to the marine environment. Such imprecise and unfounded statements fail to differentiate the impacts from different fisheries and fail to recognise the achievements realised by some fisheries management regimes. In the end they undermine the validity of the conservation message. In this case, they also contrast markedly with statements made by State fisheries and conservation agencies, which both agree that, overall in Western Australia, the environment is in good health. Most fish resources are currently sustainable and in reasonable health by national and international standards, and existing fisheries management measures ensure that fishing has limited effect on fish habitats (CALM 1998, 2000, Fisheries WA 2000).

Also, statements made by advocacy groups to promote MPAs are too often mis-represented as scientific facts. This is difficult to recognise for non-scientists and, to maintain the credibility of science, it is scientists' responsibility (fisheries scientists

[13] Today, some conservation groups seem to have reviewed their position on MPA benefits to fisheries and have began considering how MPAs could in fact be integrated as part of fisheries management.

and ecologists) to ensure that the scientific information used in the MPA debate is valid and relevant to local circumstances. Today, government conservation agencies themselves are careful not to overly promote MPAs for their potential benefits to fisheries. Nonetheless, the aggressive, but largely unfounded, conservation message has left a legacy of confusion, frustration and distrust in conservation objectives among commercial fishers. There are three key issues that need clarification.

First, for most Australian fisheries, management has not been shown to have failed (with regard to stocks of targeted species). On the contrary, Australian fisheries are, overall, considered to be well managed by international standards (Mace 1997). This is also recognised in the Oceans Policy (Commonwealth Government 1998).

Recently, fisheries scientists in Tasmania have shown that, under current fisheries management regimes, the levels of egg production and residual biomass for the two largest Tasmanian fisheries, abalone and rock lobsters, have increased (Gardner *et al*. 2000). The legal sized biomass of rock lobsters increased by 11% in 1999, and the increase in abalone stock biomass has led to an 8% increase in TAC in 2000. On the other hand, for fish stocks believed to be under significant and perhaps unsustainable fishing pressure in Australia, such as the Western Australian sharks and bluefin tuna stocks, it is unlikely that MPAs would be of much help (Fisheries WA 2000). However, it remains important for management to understand, on a fishery-by-fishery basis, the impacts of fishing on the environment and to act accordingly (Hall 1999, Leadbitter *et al*. 1999, Garcia and De Leiva Moreno 2001).

Second, besides the confusion created by advocacy groups, not all scientists agree on the merits of MPAs either, or even on the definition of biodiversity (Lunney *et al*. 1998). Beck (1998) noted that the widespread use of the term biodiversity in ecology and conservation biology has led many people to wrongly assume that there is broad scientific support for this concept, and that diversity *per se* is essential for ecosystems to function optimally.

Ecologists and fisheries scientists tend to have different opinions, but ecologists have had much more of a say in the MPA debate compared to fisheries scientists. In Australia, despite their expertise in fisheries matters, fisheries scientists seem to be rarely invited to contribute to MPA negotiations. Generally, their position is that MPAs are not a panacea, but could provide an additional tool to the existing array of biodiversity and fisheries conservation measures (Kensington 1995, Buxton 1998, 2000, Fisheries WA 2000). Cappo *et al*. (1998) recognise that MPAs, and spatially-based management plans in general, provide both a challenge and an opportunity for fisheries. They stress that it will be difficult to optimise the fisheries value of MPAs

if available knowledge of fisheries habitat and dynamics is not used during MPA planning.

The BRS-CSIRO review (Ward *et al*. 2001), which findings were summarised earlier, is the first of its kind in Australia and it will help dispel some scientific myths and further the MPA debate. This review clearly shows that, even in the case of marine reserves implemented specifically for fisheries purposes, potential fisheries benefits are mostly theoretical and have not been demonstrated in practice. It is also clear that fisheries benefits described in many studies on MPAs or MFRs are mostly observed for fisheries already over-exploited and/or under little or inappropriate management, as is the case of many small-scale tropical fisheries in developing countries (Gardner *et al*. 2000, Ward *et al*. 2001 and references therein). The results of scientific analyses in one situation are not necessarily applicable to other situations; they are usually site and species-specific (Buxton 1998). Despite their apparent differing positions on the role and performance of MPAs, Edgar and Barrett (1999) and Buxton *et al*. (2001) agree that empirical studies on the effects of marine reserves are few, and of varying quality, compared to the number of reviews and desktop studies that recommend them. They also acknowledge that the tacit acceptance that fisheries resource enhancement aims are achieved with the declaration of MPAs is questionable.

Hannesson (1998) conducted a modelling study looking at the effectiveness of marine reserves in protecting fish populations from over-fishing in the case of temperate, open-access fisheries. The author focused his analysis on the interaction between fish movement behaviour, cost of fishing and reserve size. He found that marine reserves on their own, without any measures to restrain fishing effort and capacity, might achieve little more than increasing the costs of fishing.

Third, under Australian co-management and cost recovery regimes, fishers have contributed significantly to the development of existing fisheries management systems and have gained a greater sense of ownership and responsibility in research and management. They have had to collaborate with managers and resolve difficult and protracted conflicts over management issues. Today, and despite remaining problems, fishers tend to be generally proud of what they have achieved and they are more confident in the research and management of their fisheries. As already noted by Tsamenyi and McIlgorm (1999), it is important that such hard won achievements in fisheries management are not eroded in addressing environmental concerns.

Fisheries management agencies have been surprisingly silent, at least publicly, about the current development of MPAs in Australia and about the potential impact on

fisheries sustainability and management. In their review of the interaction between Oceans Policy and fisheries management, Weaver and Alden (1999) explain that, to some extent, there exists a certain fatalism within Commonwealth fisheries management that dictates that the 'environmentalists' have won the day; that fisheries management will become absurdly difficult and extremely expensive under an ecosystem-based approach'. They also note that the releases of the Oceans Policy and the EPBC Act marked a shift of responsibility, and hence power, from the government's resources portfolio to the environment portfolio.

7.3.3 Lack of research on the potential interaction between MPAs and commercial fisheries

Even though MPAs may be implemented primarily for biodiversity conservation, they do impact on fisheries, both negatively and positively. Negative impacts would be tangible and immediate, while positive impacts would be, at best, theoretical, delayed and confounded. The interaction between the development of MPAs and fisheries management, and the potential negative impact of MPAs on fisheries, are rarely being investigated. Apart from the study currently under-way at the University of Tasmania (Buxton *et al*. 2001) and described in the previous chapter, the authors of the present report are not aware of any other study in Australia that addresses this important issue. The Tasmanian study will help better understand the role of MPAs for fisheries management.

Most MPA studies have examined the effects of reservation on species abundance inside the reserve, but few have considered the effect of the displacement (and thus increase) of fishing effort in non-reserved areas (Gardner *et al*. 2000). This parallels the approach historically followed with terrestrial reserves, where "on-reserve" conservation tends to take precedent over "off-reserve" conservation. It is now recognised that conservation effort must be directed both inside and outside reserves (Lindenmeyer and Recher 1998).

Kenchington (1995) points out that MPAs can change the distribution of fishing effort but they do not limit fishing mortality, and Hall (1999) notes that setting up MPAs may make us feel better, but unrestrained fishing outside MPAs may still eventually lead to stock collapse. MPA proponents believe that problems caused by redirection of fishing effort following the creation of reserves are unlikely to outweigh the benefits of reserves (Roberts and Hawkins 2000). They are concerned that to associate fishing regulations inside reserves with additional fishing regulations outside reserves would represent a double burden on fishers and, consequently, further diminish their support for reserves.

Buxton *et al*. (2001) also identify resource use and allocation conflicts, including those generated by the implementation of MPAs, as one of the threats to the sustainability of fisheries. It is important to distinguish the benefits of MPAs to *fisheries and fishers* (in terms of increased yield via larval dispersal and spill-over) and benefits to *fisheries management*. These are two different ways to look at the impacts of MPAs, but they are often confounded (ie. the effectiveness of fisheries management is not necessarily measured in terms of increased yield).

7.3.4 Duplication of administrative arrangements and cross-jurisdictional difficulties

7.3.4.A Fisheries versus conservation jurisdiction

Cooperation between environmental and fisheries management agencies is recognised as a key requirement for the successful development of MPAs, however this is very difficult to achieve in Australia, as elsewhere (DFO 1997, Kelleher and Recchia 1998, Williams 1998, Parks Canada 1999, NRE 1999, Parrish *et al*. 2000, DOC 2000, Milon 2000). In Australia, there has been a long and difficult debate between conservation and fisheries agencies on which agency should have the responsibility for managing fisheries within MPAs (Leadbitter *et al*. 1999). Today, conservation legislation over-rules fisheries legislation within MPAs, that is conservation agencies have the power to ban fishing in some zones within an MPA according to their protection levels. The management of fishing activities allowed in the remaining zones is the responsibility of fisheries agencies.

It is during the development of management plans for MPAs that the effective collaboration between government agencies is really tested, that is when fisheries and conservation agencies need to negotiate their share of management costs. The question of which agency will be responsible (and pay) for monitoring and enforcement costs is a contentious issue for the commercial fishing industry. The move to cost recovery in the management of many Australian fisheries means that fishers today pay more for fisheries management and, consequently, are more aware of, and a greater say on, government financial expenditure. They are understandably concerned when it appears that fisheries agencies will, in most cases, be responsible for additional fisheries enforcement costs in marine reserves (eg. Fisheries WA 2000).

There are also difficult negotiations between fisheries and conservation agencies about the allocation of fishing permits within MPAs. For example, in Commonwealth waters, under the *National Parks and Wildlife Conservation Act 1975* (NPWC Act) fishers must hold a NPWC permit in order to commercially fish in a Commonwealth MPA. In 1999, EA and AFMA began developing a Memorandum of Understanding

for the administration of fisheries in the Great Australian Bight (GAB) Marine Park (ASIC Bulletin 1999). By early 2001, EA proposed an amendment to the management plan of the GAB Marine Park to remove the requirement for commercial fishers to hold EA permits to fish in the park. However, the Minister for Environment and Heritage has not approved the amendment (AFMA Environment Update 15).

In some States, government fisheries and conservation agencies have been re-structured to facilitate their collaboration. However, the re-structuring has been limited to amalgamating the two agencies under the same department (and same building), as was done in Tasmania and New South Wales (chapter 6). This approach appears to have had varying degrees of success. It is somehow forcing alliances between government agencies in spite of the long-standing differences in their philosophical beliefs, legislative responsibilities and operational framework. It creates administrative problems, such as duplication of work effort, increased time delays in decision-making, conflicting views between staff and, in some cases, duplication of authorisation power. Nonetheless, some government employees commented that conservation and fisheries agencies tend to better collaborate under these arrangements.

This sort of re-structuring may have the benefit of increasing professional contacts between individuals, but it does not bring conservation and fisheries objectives and legal responsibilities any closer. By comparison in Western Australia, where conservation and fisheries agencies remain separate, the satisfaction of both conservation and fisheries objectives seem to have been more effectively assured through ministerial concurrence of power (see chapter 6), than by physical rapprochement of their administrative agencies. The success of the Western Australia MPA planning process partly results from the clarification, through the legislation of compensation, of the role of MPAs for biodiversity conservation (as distinguished from fisheries management).

7.3.4.B State versus Commonwealth jurisdiction

There are problems with State-Commonwealth management arrangements in the case of adjoining MPAs, which were declared separately under State or Commonwealth legislation. Apart from the memorandum of understanding signed in NSW between the director of National Parks and Wildlife (Commonwealth) and the Marine Parks Authority (chapter 6), little information was found during this study on formal complementary management arrangements between State and Commonwealth Governments. It appears that attempts to implement such arrangements continue to raise contentious jurisdictional issues.

One of the issues is that State and Commonwealth agencies do not always give the same level of protection to their adjoining MPAs. For example in Western Australia, the State and Commonwealth have attributed different IUCN categories to their adjoining components of the Ningaloo Marine Park (with the Commonwealth imposing greater restrictions on commercial fishing), making the coordination of fisheries regulations rather difficult in practice.

7.3.5 MPAs versus fisheries habitat areas

In Australia as well as overseas, area closures have long been used by fisheries agencies as part of fisheries management (Ward *et al.* 2001). In Australia, there is a heated debate between the fishing industry and government agencies on whether or not these fisheries reserves should be integrated as part of the NRSMPA. Governments in Canada and Australia have chosen not to include them in their MPA inventories, while the USA includes some of them (MPA News August 2001). As seen earlier, although fisheries reserves are established primarily for fisheries purposes, they are believed to also contribute significantly to environmental protection and biodiversity conservation (Ward *et al.* 2001). The Australian fishing industry argues that to integrate them in the NRSMPA would reduce the need to reserve more grounds and, thus, would limit industry's loss of access to fishing grounds. Kelleher and Recchia (1998) remarked that opposition to using fisheries reserves as MPAs appears to be counter-productive, and inhibits cooperation between fishers and environmentalists. However, conservation agencies claim that most of these fisheries reserves are too small and do not have secure tenure.

During this study, it was difficult to determine the position of the fisheries agencies on this issue. The most tangible position was probably from Western Australia where the State fisheries agency (1) recognises that its responsibilities under fisheries legislation are compatible with the development of a system of multiple-use MPAs, (2) agrees that no-take areas can, by preventing fishing, provide some protection for part of fished stocks, but (3) stresses that the use of MPAs and no-take areas as a general fisheries management tool is limited by comparison to more dynamic and targeted fisheries management measures (Fisheries WA 2000).

7.3.6 Conclusions

For a long time there has been little connection between fisheries conservation and biodiversity conservation measures (Williams 1998). However, this is changing and, today, there is an important debate worldwide about the use of MPAs as tools for fisheries management. It is mostly taking place in countries where traditional fisheries management is either not possible, eg. in the tropics (see references in Ward

et al. 2001), or is failing in some developed fisheries (eg. Kenchington 1995, Attwood *et al*. 1997, Guenette *et al*. 1998, Walter 1998, Lauck *et al*. 1998, NRC 1999, Parrish *et al*. 2000, FSBI 2001). In the USA and Canada, granting fishing rights to fishers is not always considered as an adequate fisheries management approach and the potential of MPAs in resolving fisheries management problems is being actively investigated (Walters and Bonfil 1999, Walters 2000, Pitcher 2001). MPAs are not seen as substitutes for fisheries management but as complementary to existing fisheries management tools (Kenchington 1995, DFO 1997, NRC 1999).

The confusion between conservation and fisheries management objectives is a major concern for the commercial fishing industry. Whether MPAs are used solely for biodiversity conservation or for a combination of biodiversity conservation and fisheries management has major implications for their selection and design (size, location, level of protection). It also has implications when assessing the benefits and losses that MPAs generate for the commercial fishing industry. It also influences the industry's sharing of MPA management costs (monitoring and enforcement) and its potential involvement in MPAs processes (Kenchington 1995, Neis 1995). If MPAs were to have a greater role in fisheries management, the fishing industry could contribute its knowledge to the development and performance of MPAs (eg. participation to monitoring, ensuring high level of compliance, enforcement role, etc.). This opportunity for partnership with the fishing industry deserves to be explored by government agencies.

Recommendations about whether or not, in Australia, MPAs should be used for fisheries management, biodiversity conservation or both are outside the scope of this study. The commercial fishing industry itself does not seem to have a unanimous position on this issue. The point made here is that there is a need in Australia for a discussion to take place between government fisheries and conservation agencies and the commercial fishing industry in order to clarify these issues. To effectively integrate MPAs with fisheries management would require, at the very least, better cooperative practices between conservation and fisheries agencies.

8 MPAs AND THE PRECAUTIONARY PRINCIPLE

Many of the problems faced by fisheries today are attributed to the lack of precautionary approach in traditional management systems and the implementation of no-take areas is being promoted as a precautionary tool to protect both fisheries resources and biodiversity (Roberts and Hawkins 2000, Ward *et al*. 2001). The precautionary approach[14] is a philosophical framework for the management of natural resources, where the precautionary principle essentially guards against the possibility of making irreversible mistakes through ignorance (Thompson and Mace 1997). Its major property is that it inverses the course of action, requiring that measures are taken first and, subsequently, relaxed if research demonstrates that they are not necessary (Garcia 1994).

The precautionary principle is now relevant in almost any situation dealing with natural resource conservation. However, its precise interpretation and operational procedures are rarely formulated. This principle needs to be considered within a structured approach to the *assessment* and *management* of risks (CEC 2000). Hilborn et al. (2001) noted that the precautionary principle is most useful for the management of risks.

The recourse to the precautionary principle relies on adherence to a few rules. It presupposes that threats have been identified in some tangible way and that the risks associated in ignoring these threats have been assessed using precautionary reference points (Hilborn 1996, CEC 2000). Threats and risks are then reviewed as knowledge and information increase, and the need to rely on the precautionary principle is also re-assessed (CEC 2000). Precautionary management approaches should be commensurate with potential risks, should take account of the potential benefits of the activities being managed, and should be implemented in a stepwise and adaptive manner (Young 1993, FAO 1996).

In Australia, the Inter-governmental Agreement on the Environment (Commonwealth Government 1992) defines the precautionary principle as:

'Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent

[14] In the literature, the precautionary 'principle' is sometimes used to refer to 'hard line' management rules (eg. in cases of highly polluting activities); the precautionary 'approach' tends to refer to more flexible management measures (eg. incorporating socio-economic considerations) (Garcia 1994, Thompson and Mace 1997).

environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by: (i) careful evaluation to avoid, whenever practicable, serious and irreversible damage to the environment; and (ii) an assessment of the risk-weighed consequences of various options.'

The Oceans Policy endorses this definition of the precautionary principle and also stipulates that management regimes should be adaptive and allow for changes in resource value (both improvement or degradation) through changes in information or technology.

In the case of MPAs, however, there has been little research done on identifying threats and assessing risks. The simple fact of setting aside highly protected areas is regarded as sufficient to ensure a precautionary approach (eg. CALM 1999). The precautionary principle is being assimilated to 'bet-hedging' (or to an 'insurance policy') and seen as a way to reduce the probability of fisheries collapse (Roberts and Hawkins 2000, Ward *et al*. 2001). Bet-hedging is a technique developed in the economic field to cope with uncertainty and lack of knowledge. In this context, selecting comprehensive, representative and adequate MPAs within bioregions is regarded as equivalent to spreading valuable assets among diversified portfolios (Lauck *et al*. 1998). This approach may be precautionary in an economic sense, but is it precautionary in ecological terms? How far can we rely on this economic metaphor to protect the marine environment?

The precautionary principle is also closely associated to an ecosystem-based approach in the establishment of MPAs to protect biodiversity. There is little doubt that the ecosystem approach is a positive move in the management of natural resources. However, it also makes scientific research much more complex, if not impossible with conventional scientific methods (see for example Yodzis 2001). As a result, conservation groups promote the ecosystem-approach as being much less data demanding, and thus more readily applicable (Roberts and Hawkins 2000). From a conservation point of view, implementing MPAs based on ecosystems will intrinsically account for ecological complexity without a need for additional data. However, Jennings (2001) recognises that the models needed to assess the conservation benefits of MPAs once they have been established are, ironically, complex and data intensive.

Under the precautionary principle, conservation policies usually require that 'the best information available' be used (chapter 5). However, the quality of the information required is not defined and the 'best available' standard even permits the use of poor evidence to justify conservation measures (Garcia 1994).

As the limited state of our knowledge is increasingly being accepted as a *fait accompli*, there is a tendency to rely on proxies and surrogates to replace missing scientific information (Vanderklift and Ward 2000). For example in the case of MPAs, geophysical features are used as surrogates for ecosystems and habitats (Ray 1997, DETR 2001), and changes in abundance of species, and of icon species in particular, are used as surrogates for changes in biodiversity (Jones *et al*. 1992, Beck 1998, Hall 1999, Planes *et al.* 2000, Ward *et al*. 2001). There are concerns that the geophysical definition of ecosystems is inadequate in selecting representative areas because it does not take into account functional connectivity and dependency. Icon species such as marine mammals tend to be selected because they are charismatic and of public interest, but as vertebrates their life history traits (long generation times, slow growth rates) and generally low natural population numbers make them poor surrogates for assessing changes in biodiversity (Landres *et al*. 1988).

It is clear that management decisions have to be made even if scientific knowledge is inadequate and this is the purpose of the precautionary principle. However, MPA proponents fail to recognise the adaptive nature of the precautionary principle and its dependency on generating information (see Hall 1999 for a discussion on adaptive fisheries management). This is aggravated by governments' general lack of commitment to the identification of threats and assessment of risks, making the monitoring of the performance of MPAs an even more elusive task for scientists.

The improper use of the ecosystem-based precautionary approach demonstrates a level of complacency and unjustified optimism about the value of MPAs as a management tool. While MPAs are being promoted as a protection against fisheries management failure, their effectiveness as a natural resource management strategy is not being assessed. In Australia, the national guidelines are clearly a means to accelerate the development of the NRSMPA and set State agencies in motion to achieve a higher rate of MPA declaration, but little attention is paid to assessing the need, value, and performance of MPAs (ie. MPAs tend to be seen as outcomes rather than tools). Given the many serious threats to the marine environment that exist outside MPAs, the implementation of MPAs may be precautionary in intent, but may still be inadequate in protecting the marine environment, regardless of their impact on fisheries management. While conservation groups promote MPAs on the grounds that fisheries management is failing, MPAs could turn into a management failure too.

The current selection and design of MPAs are strongly driven by the reliance on geophysical ecosystem surrogates and an overly simplified use of the precautionary principle, and this with serious consequences for fisheries and their management. The

commercial fishing industry is currently the user group paying the highest price for scientific uncertainty and the subsequent use of the precautionary principle. It would only be fair to have protocols in place to formalise the use of this principle and assess its impact on resource users.

9 ANALYSIS OF INDUSTRY'S CONCERNS WITH MPAs

The commercial fishing industry recognises that the sustainability of fisheries is strongly linked to the health of the marine environment (Leadbitter *et al*. 1999). Most of industry's current resistance to MPAs is created by the lack of proper recognition and consideration by governments of the potentially negative impacts of MPAs on commercial fisheries. The combination of loss of access to fishing grounds and mixed and confusing government information on whether or not MPAs achieve their objectives gives fishers little confidence in the value of MPAs.

9.1 THE AUSTRALIAN SEAFOOD INDUSTRY COUNCIL POLICY ON MPAs

In 1998, the Australian Seafood Industry Council (ASIC) developed a policy on MPAs stating industry's concerns with the development of the NRSMPA. The policy was then reviewed by the ANZECC Task Force on MPAs in April 1999 (Appendix 10). There appeared to be common grounds and agreements between ANZEEC and ASIC on some of the principles underlying the NRSMPA.

The ASIC Policy made 9 recommendations (Appendix 10) addressing the following key issues:

- multiple-use and catchment based management;
- clarification of the objectives of MPAs and performance assessment;
- assessment of socio-economic impacts of MPAs and assistance for structural adjustment; and
- consultation with the commercial fishing industry and fisheries agencies.

The commercial fishing industry does not believe that its concerns have been properly addressed. A detailed review and analysis of industry's concerns and of issues they raised is presented below.

9.2 THE TARGET APPROACH

The target concept was originally developed to establish highly protected areas on land, where it is based on protecting a portion of a species preferred habitat and range. Similarly, MPA proponents claim that effective protection of the marine environment

also relies on providing high protection (ie. no-take areas) to a target proportion of the oceans. However, the nature and functioning of land and marine ecosystems are very different and there is some debate on whether a land-based approach is appropriate for the marine environment (Ray 1997, Leadbitter *et al*. 1999). For example, oceans are characterised by a functional connectivity (through dispersal mechanisms) that differs from the one observed on land (Agardy 1993). Terrestrial parks are usually associated with semi-closed ecosystems, while MPAs are almost always associated with large and dynamic open marine ecosystems (NRC 1995, Parks Canada 1999). But Ray (1997) believes that terrestrial-marine differences are matters of degree and scale, not of kind. Pressey and McNeill (1996) also note that the most important similarity between terrestrial and marine environments is of an operational nature and relates to the applicability of the same tools (eg. implementation of protected areas) in conservation planning.

Various organisations at The Fourth World Congress (1987) on National Parks and Protected Areas called for a minimum of 10% of each of the world's major ecosystems to be incorporated into highly protected areas. The literature[15] on MPAs suggests target values ranging from 10 to 50% of marine waters (Lauck *et al*. 1998, Parrish *et al*. 2000, Roberts and Hawkins 2000, Ward *et al*. 2001). Boersma and Parrish (1999) noted that at present levels of coastal habitation and human population growth, some target levels seem unrealistically high. The target of setting aside 20%[16] of ocean habitats is a common figure used worldwide (Roberts and Hawkins 2000).

Conservation groups often use target figures that refer to an entire marine area within a jurisdiction. As a result, the proportion of protected waters in a jurisdiction is considered too small (eg. Roberts and Hawkins 2000). Such argument has been used both to belittle the negative impact of MPAs on fishers, and as a justification for urgent reservation of more areas (IMCRA TFMPA 1998, ECC 2000). For example in Victoria, the ECC (2000) stated that the extent of areas taken by proposed MPAs represented only 6.2% of Victorian marine waters (from the coastline to the 3 mile State water limit). However, the commercial fishing industry claimed that the fishing grounds taken by proposed no-take areas would have represented between 12 and 18% of the total catch of major abalone and rock lobster species (SIV 2001).

[15] See also Bill Ballantine's essay on the target issue, "Why 10%?", on http://www/marine-reserves.org.nz

[16] The 20% target level was originally suggested by fisheries biologists to protect fish stocks, ie. it was based on protecting 20% of fish stocks from fishing. From this initial definition based on fish and fisheries characteristics, the 20% target is now used more generically to represent and protect a proportion of ocean or habitat.

The Ministerial Advisory Group, which contributed to the development of the Oceans Policy, discussed whether MPAs should include a target percentage area of no-take sanctuary zones (Commonwealth Government 1998). The group was not unanimous on the issue. Some members argued that the IUCN guidelines should be followed and that a target of 15% of bioregions should be declared no-take zones. Others disagreed that MPAs should necessarily contain no-take areas or be based on a target percentage of bioregions. The group eventually recommended that the issue be investigated further.

The Commonwealth gap analysis based on Australian bioregions (Cresswell and Thomas 1997, ANZECC TFMPA 1998), where percentage of protected areas are estimated and compared between jurisdictions (see chapter 5), is in effect equivalent to setting national targets. Indeed, the number of MPAs established in each IMCRA bioregion, and the corresponding percentage of area they cover, have been suggested as performance indicators to measure the effectiveness of biodiversity conservation and management (ANZECC TFMPA 1999, ANZECC SoER TF 2000).

At the State level, the position of government conservation agencies on the target issue remains unclear. There is no mention of any target in government MPA policies (Table 1). However, the somewhat arbitrary nature of target levels that have been suggested in the literature to drive the implementation of MPAs has become controversial. When asked whether they use a target, conservation agencies in Australia tend to either deny using one or talk about selecting an 'adequate sample of representativeness'. Such linguistic subtleties can only increase industry's anxiety about MPAs.

9.3 THE NETWORK APPROACH

According to the literature, there are two major types of marine reserve networks:

- Networks that are designed for fisheries purposes to protect target fish populations as they migrate to different types of habitats during their larval, juvenile and adult phases. These networks are said to require detailed knowledge of oceanic conditions and species biological and ecological needs;
- Networks that are designed to protect ecosystems and biodiversity. These networks are mostly based on the concept of representativeness and it appears to be implicitly accepted that they do not require detailed biological and oceanographic information. Protecting habitats themselves is advocated as an indirect way to protect fish communities without the need for detailed biological and ecological knowledge on these communities and their constituents.

As seen in chapter 6, all State and Commonwealth Governments are committed to developing networks of MPAs in their jurisdiction for biodiversity protection (the potential role of MPAs for fisheries management was discussed in chapter 7). However, the protocols to establish these networks are generally poorly defined in practice and they also vary between jurisdictions (see Table 1). For example, some jurisdictions (South Australia, Victoria, Tasmania, New South Wales, Queensland) identify and select all MPAs to be part of their State networks concurrently. Other jurisdictions (Western Australia, Northern Territory, and the Commonwealth) select individual MPAs sequentially.

Government agencies may spend many months working on the identification of candidate areas for the networks, often neglecting to properly inform fishers on the process. During this time, fishers' anxiety grows as they wait for the Government's 'verdict' in the form of a list of candidate areas: how many MPAs are going to be implemented and where, how large will they be, what will be the impact on fishing? The lack of transparency and explanation from government agencies at this first stage of the MPA process creates a fertile terrain for misunderstanding and rumour. Fishers tend to feel less anxious when MPAs are identified and negotiated one at a time, although they still want to know how many MPAs are needed to create an effective network in their region (ie. they need to know when the establishment of MPAs and associated loss of fishing grounds will stop).

9.4 NUMBER AND SIZE OF MPAS

It is unclear to members of the commercial fishing industry how the identification criteria listed in the national guidelines (described in chapter 5) are used in practice to decide on the number and size of no-take areas in a network.

The review of government MPA policies and various related documents suggests that the factors that most influence the design of networks of MPAs in Australia are:

- specific government recommendations in relation to the national gap analysis, the number of bioregions in a jurisdiction, and their ecological diversity (which influences the number of MPAs by bioregion);
- consideration of user conflicts and socio-economic factors;
- practicality of compliance and enforcement (eg. remoteness); and
- scientific advice on the ecological requirements of animal communities and ecosystem functioning. The adequacy principle (the 'A' in the 'CAR' principles) determines the size of MPAs necessary to sustain ecological processes and

ecosystem functions. However, it is generally recognised that scientific information is scarce.

There is a long-standing debate stemming from terrestrial conservation regarding the relative merits of a single large or several small (SLOSS) protected areas (McNeill 1994, Roberts and Hawkins 2000, Francour *et al*. 2001). The scientific literature suggests that networks of small no-take areas are to be preferred from a fisheries perspective, at least for non-migratory species (eg. Cappo *et al*. 1998, Palumbi 2001, Francour *et al*. 2001, Ward *et al*. 2001). The key factors in designing an effective network are the span of the network (to cover species dispersal distances), the size of individual no-take areas, their number, their location and connectivity (Palumbi 2001).

However, Walters (1998, 2000) believes that the use of MPAs as an ecosystem-based approach to fisheries management requires a reversal in thinking about spatial protection of aquatic ecosystems: protection should be the rule, and fishing areas should be the exceptions (ie. having fewer but much larger MPAs). Ballantine (1995, 1997) also considers that the individual characteristics of reserves and their connectivity are of secondary importance. According to this author, it is more important to ensure that a network of MPAs be representative, contain replicates and be sufficiently large. Overall, advocates of MPAs for biodiversity conservation tend to prefer fewer but larger no-take areas. The jury is still out on the SLOSS debate (Hall 1999) and much depends on what the objectives of the reserves are.

9.5 OBJECTIVES OF MPAs

One of the major concerns for the commercial fishing industry is the lack of clarity in the objectives of MPAs. The review of government conservation documents undertaken during this study indicates that there is a tendency to confound principles (eg. precautionary principle) and tools (spatial closures such as MPAs) with the actual objectives of MPAs (ie. setting out in detail what MPAs are expected to achieve in ecological terms). Management plans of individual MPAs usually describe MPA objectives in generic terms relating to 'biodiversity protection', sometimes mixed with mentions of potential benefits to fisheries (eg. ECC 2000, QPWS 2000). The difficulties in defining the objectives of MPAs relate partly to the difficulties in defining biodiversity itself (Lunney *et al*. 1998, Leadbitter *et al*. 1999). The industry recognises that, overall, the development of MPAs is driven by good intentions to protect the environment. However, vague motherhood statements are, understandably, not enough to alleviate their concerns about the impacts of MPAs on

their activities and livelihood (and they are also unlikely to effectively safeguard marine biodiversity). Agardy (2000) stressed that the most crucial part in establishing MPAs is the definition of their objectives, and that the information needed to define these objectives is ultimately societal, not scientific.

One factor that contributes significantly to the confusion about MPA objectives is that the same set of objectives is used at various spatial scales (ie. national, regional, and local). Conservation agencies tend to justify the implementation of local MPAs by using the same national objectives developed for the NRSMPA. The rationale behind the national network approach is not readily transferable to regional or local circumstances. In particular, one of the most difficult tasks at the local level is the definition of multiple-use management objectives during the zoning of individual MPAs. It is precisely at this level that conflicts between users arise and that clear objectives are needed to facilitate negotiations. It is also where and when the integration of biodiversity conservation and fisheries management objectives sometimes needs to be mediated.

While conservation groups tend to focus on broad-scale objectives at the national or international levels, the industry, and the general public, tend to focus on the local scale. The CAR principles, the driving force behind the development of the NRSMPA, bear little weight in fishers' understanding of the need for, or value of an MPA in their local area. They do not relate well to what commercial fishers and other marine users observe and understand at the local level.

Fishers are not the only ones to be concerned with the lack of objectives in developing MPAs. Scientists are concerned that, without clear objectives with measurable outcomes, they will be unable to assess with confidence whether MPAs protect biodiversity (McNeill 1994, Vanderklift and Ward 2000). Attwood *et al*. (1997) also found that the lack of objectives for many South African MPAs hindered their public acceptance and management.

9.6 SCIENTIFIC METHODS USED TO IDENTIFY CANDIDATE AREAS

As seen in chapters 5 and 6, the selection of MPAs by government agencies usually involves two stages: scientists first assess the ecological values of an area (the identification of candidate areas), then socio-economic values are assessed in collaboration with user groups (the selection of MPAs). In practice the identification of candidate areas ranges from qualitative experts' best-guess approaches to quantitative and computer-based approaches (Crosby *et al*. 1997, Turpie *et al*. 2000,

Jamieson and Levings 2001, Manson and Die 2001). With the latter approach (also called *systematic* approach, by contrast to *ad hoc* approach), the identification of candidate areas is based on setting numerical targets, also referred to as 'feature targets' (Pressey 1999). For example, these targets can be proportions of coastline or of ecosystems, numbers of species to be protected, levels of abundance for particular species, etc. This is complex and very data-driven computing work in which the community is not involved (Pressey 1999).

At the moment, only New South Wales and Queensland seem to be using such a computerised approach. Other jurisdictions appear to rely mostly on experts' best-guess approaches (Table 1). There is some inconsistency between relying on the precautionary principle because of the lack of available data and using sophisticated and very data demanding methods to identify candidate areas for reservation. MPAs are often selected on the basis of little or no ecological data, and on even less knowledge about the processes that maintain biological diversity (Vanderklift and Ward 2000). Given the general lack of adequate data, one can only wonder how meaningful the systematic identification is.

While it is clear that fishers, like most other stakeholders, have limited expertise in ecological concepts, which more appropriately belong to the scientific debate, they still need to feel confident that the scientific work underpinning the identification of MPAs is rigorous and relevant. They want to know how candidate areas are identified, which data are used, and whether or not targets are used[17].

9.7 IDENTIFICATION OF THREATS TO THE MARINE ENVIRONMENT

Conservation groups tend to present commercial fishing as a major threat to the marine environment. In reality, however, and without denying that fishing may impact on the marine environment, major threats to the marine environment and its biodiversity often originate from land-based activities. In a recent overview of marine fisheries, Garcia and De Leiva Moreno (2001) stressed that 'While there is no alternative to rationalizing the fishery sector and ensuring that it bears the costs of as many of its impacts as possible, considerable attention is needed to ensure that, in the process, fisheries are equitably treated in comparison to other land-based or sea-based sectors, such as agriculture, oil and gas industries, or tourism.' The authors believe

[17] Manson and Die (2001) state that commercial fishing data can be critical for classifying ecosystems and selecting candidate areas.

that the fishing industry has been inappropriately burdened as the driving force of degradation of marine ecosystems.

9.7.1 Land-based threats to the marine environment and integrated management

The Australian Institute of Marine Sciences recently conducted a review of scientific research on Australian fisheries habitats (Cappo *et al.* 1998). The authors found that the major anthropogenic disturbances to fisheries habitats are from urbanisation, land and freshwater use (eg. impact of agriculture run-off and pollution), and introduced pests and diseases on the coastal zone, and from fishing in shelf and slope waters. The connectivity of the marine environment means that the ecological impacts of some land-based activities can occur at large spatial scale. Similar conclusions were drawn from overseas studies (Allison *et al*. 1998). MPAs cannot prevent the impacts of many human activities.

In addition to the biological threats listed above, the State of the Marine Environment Report for Australia (Zann 1996) also listed some management issues that significantly affect the marine environment, including the lack of strategic planning, lack of marine science policy, and lack of consideration of social issues. In Australia and overseas, improved cross-jurisdictional collaboration is recognised as a fundamental requirement to achieve effective (catchment-based) integrated management and protection of the marine environment (McNeill 1994, Crosby 1997, Commonwealth Government 1998, Parks Canada 1999). This is particularly critical in dealing with the marine environment because of its characteristic fluidity and dispersal patterns (Boersma and Parrish 1999). Cross-sectoral and cross-jurisdictional issues were reviewed in some detail during the development of the Oceans Policy (Pitts 1997, Sainsbury *et al*. 1997). Later, the Commonwealth Strategic Plan of Action for the NRSMPA (see chapter 5) included one action (Action 28) specifically to review existing joint cross-jurisdictional arrangements.

The creation of multiple-use MPAs is believed to be a powerful tool in building integrated management of human activities in the marine environment (Kelleher and Kenchington 1991, Eichbaum and Agardy 1997). The number of MPAs (and their extent and IUCN classification) is recommended as one of several indicators to measure the effectiveness of integrated management (Ward *et al*. 1998). Experience so far indicates that the creation of MPAs increases the need for an integrated approach to the management of marine resources, but it does not necessarily facilitate or guarantee that such integration will materialise. This reflects some confusion between ‘ecological integration’ (ie. ecological analysis at the ecosystem level) and

'management integration' (ie. integration of legislative and administrative arrangements between the sectoral activities that affect ecosystems).

Management instruments and incentives to protect biodiversity 'off-reserve' have been reviewed by Young *et al*. (1996) during the drafting of the Oceans Policy. Greiner *et al*. (1997) also suggested management instruments to improve water quality of streams, estuaries and oceans. However, at the moment, the management of multiple-use MPAs is only concerned with activities inside MPAs. Further, management decisions for MPAs are not really the result of sectoral negotiations, they remain the responsibility of a sole agency (a conservation agency). There is generally no legislative framework to facilitate the sharing of resources and to promote operational complementarity between government agencies (Leadbitter *et al*. 1999). In spite of these limitations, Australia's Oceans Policy recognises that legislative changes cannot be expected in the short term and that multiple-use management must progress under the existing legislative framework while an improved framework is developed (Commonwealth Government 1998).

With regard to commercial fisheries, Western Australia and the Northern Territory appear to be the only jurisdictions where some form of integration between conservation management and fisheries management is taking place. In Western Australia, the integration is through a formal and statutory requirement for a ministerial concurrence of agreement, while the Northern Territory relies on informal inter-agencies arrangements (see chapter 6).

Conservation agencies dealing with the development of MPAs recognise that land-based activities have the most significant impacts on the marine environment and that existing regional catchment programs do not satisfactorily address these impacts (GBRMPA 1998, CALM 2000, ECC 2000). However, and despite their often stated desire for integrated ecosystem management, they have in practice limited power to influence the management of human activities outside MPAs (Valentine *et al.* 1996). At the moment, the management strategies proposed by conservation agencies to address these whole-of-government issues tend to be limited to 'liaise with other agencies,' or 'provide and share advice and information' in order to educate them on the value and role of MPAs (eg. ECC 2000, CALM 2000).

There is also a tendency to rely on direct stakeholders' input to resolve cross-sectoral resource allocation problems (Pitts 1997). Effective integrated management cannot be achieved this way alone, it needs a whole-of-government approach. Many of the threats to the marine environment still relate to poor catchment management and the

establishment of the NRSMPA may not effectively protect biodiversity (Buxton 1998).

9.7.2 Representativeness versus rehabilitation

According to the national guidelines, MPAs selected for the NRSMPA should be in an undisturbed or pristine ecological state and under no natural or human threats (see the description of the vulnerability criterion in chapter 5). In accordance with the vulnerability criterion, preferred sites for reservation are those that are not going to be impacted, eg. areas near already protected land areas. The development of the NRSMPA is clearly not concerned with habitat rehabilitation. This may partly explain why the development of formal integrated management arrangements between sectoral activities, including land-based activities, has not been given a high priority. But it does highlight some inconsistencies in the way fishing activities are readily identified as a major threat and subsequently restricted or banned when establishing MPAs.

The commercial fishing industry is concerned that the time and energy spent by government agencies on developing MPAs has diverted the effort needed to target large scale threats to the marine environment, particularly in waters close to urban and industrial development (SIV 2000).

9.7.3 Threats to the sustainability of commercial fisheries

As discussed previously, the debate about fishing and the environment focuses on the threats that fishing may represent for the environment. Much less attention is being paid to the fact that the land-based activities discussed above do not only threaten the environment but the sustainability of fisheries as well (Done and Reichelt 1998, Buxton and Gardner 1999, Buxton *et al*. 2001). Over-fishing and fishing-related habitat degradation are not the only threats to fisheries. A recent study in Australia showed that such conclusions were also relevant to freshwater fisheries (Davis *et al*. 2000). Buxton *et al*. (2001) also viewed resource allocation conflict (ie. displacement of fishing effort) resulting from establishing MPAs as a potential threat to the sustainability of some fisheries.

Some aspects of conservation objectives are particularly contentious and potentially threaten the continuity of some fishing activities, even when shown to be sustainable. The conservation goal to maintain or return the environment to a pristine state, or re-establish ecosystem balance, is one of them. The development of sustainable marine fisheries requires the acceptance that fishing will have some impacts on the marine

environment. What is needed is to identify the impacts, assess their magnitude and work out means to reduce them (Garcia 1994, Leadbitter *et al*. 1999). A key issue to consider is whether the wider community accepts that some impacts are inevitable consequences of supplying seafood and providing exports and jobs (Leadbitter *et al*. 1999).

9.8 SOCIO-ECONOMIC ASSESSMENT

It is well recognised that the management of natural resources cannot be based on ecological values only, but must also include socio-economic values (Fiskes 1992, Crosby 1997, Agardy 2000). Kelleher and Recchia (1998) remarked that it is usually the socio-economic rather than the biological factors that determine success or failure of MPAs. They stressed that, in addition to biophysical factors, socio-economic factors should be addressed from the outset in identifying sites for MPAs.

The Oceans Policy itself is promoted as providing a framework for the integration of environmental, economic, social and cultural ocean uses (Commonwealth Government 1998). The policy also recognises the value of the seafood industry, pointing out that this industry is the fourth largest primary industry in Australia and generates major export earnings, and that commercial marine fisheries provide significant regional economic and employment opportunities. The gross value of Australia's commercial fisheries production is currently estimated at over $2 billion per annum. Nonetheless, the primary goal of the NRSMPA remains biodiversity conservation and, as seen in chapter 6, governments' MPA planning processes clearly give more weight to ecological values than to socio-economic values.

According to commercial fishers, the assessments of the socio-economic values of their industry, and of the potential impacts of MPAs, are generally inadequate. This has led to vigorous opposition from industry to MPA proposals (as seen most recently in Victoria and Queensland). The problems with these assessments are two-fold: they are made using very rudimentary methods, and they focus on one particular economic aspect of fishing (the landed value of catches), disregarding other important economic factors such as flow-on effects, capital investment, economic efficiency and opportunity loss.

The method generally used to assess the economic value of fisheries involves comparing maps showing the distribution of fishing (ie. catches) with maps showing the location of candidate areas for MPAs. The distribution of fishing is worked out from catch data recorded on broad-scale grids (1 or ½ degree fishing blocks) in

confidential commercial logbooks (fisheries agencies also provide the data to conservation agencies in an aggregated form for confidentiality reasons). The dollar value of catches recorded in each block is estimated from average market prices. Then, the impact of an MPA is estimated from the proportions of each fishing block that it covers. Fishing grid-maps were created for fisheries management purposes and they do not adequately represent fishing grounds. Their scale is not compatible with the scale used to delineate MPAs. As a result, an MPA that covers comparatively small proportions of large fishing blocks will be estimated as having a limited impact on fishing, regardless of what proportion of actual fishing grounds it covers.

The role of the commercial fishing industry as a food provider to the community is not well acknowledged or investigated. Current MPA planning processes fail to assess the potential socio-economic consequences of the loss of fishing grounds to food production for local, regional and urban communities. Comprehensive studies of public perception and reliance on commercially caught seafood are needed. For example, in 1997, WAFIC commissioned a study into community fish consumption habits (David Hide Consulting Group 1997). The survey showed that 93% of Western Australians eat seafood and that the majority (83%) of households buy 50% or more of the seafood they consume (rather than catch it). The study showed that the majority of the public does value their supply of fresh local seafood from the commercial fishing industry. Other seafood consumption studies by Ruello & Associates (1999, 2000) showed that seafood consumption has increased in Sydney by about 13% between 1991 and 1999 (particularly out-of-home consumption). These studies also showed that three out of four consumers preferred Australian seafood (rather than imported), and many expressed a very strong preference for local products.

Fenton and Marshall (2001) recently completed a major study of the social and financial profile of the commercial fishing industry in Queensland and of its social and financial relationship with coastal communities. The aim of the study was to help the assessment of potential social and financial impacts associated with changes in fisheries regulations and resource use. The authors concluded that comprehensive and dedicated research is needed to properly address the complexity of the socio-economic factors that govern the commercial fishing industry and its relation with coastal communities.

9.9 FISHING RIGHTS AND COMPENSATION

9.9.1 Zoning of multiple-use MPAs and resource allocation

The multiple-use management of marine resources involves an allocation (or re-allocation) of resource access among users. The Oceans Policy states that decisions about resource access or use need to be equitable, objective and transparent and should include explicit assessment of impacts, in particular on other recognised users and on ecosystem integrity (Commonwealth Government 1998).

While the commercial fishing industry welcomes the concept of multiple-use, it is concerned about the zoning process being used to allocate resources and about equity implications. Equity is recognised as one fundamental principle that must underpin multiple-use management (Sainsbury *et al*. 1997). Industry representatives disagree with government conservation agencies promoting the zoning of MPAs as an effective tool to resolve users' conflicts (see ASIC policy, Appendix 10). Conservation agencies usually do not have the authority to manage fisheries, nor the appropriate expertise to understand or address the complexity of ecological and socio-economic issues that are involved in resource allocation. Tsamenyi and McIlgorm (1999) even suggested that a dispute settlement procedure should be set in place as part of MPA negotiations.

Conservation agencies view zoning both as a biodiversity conservation tool and as a resource sharing/conflict resolution mechanism (eg. CALM 2000, ECC 2000). However, these are two very different objectives that are difficult to reconcile through a unique system of zones. Broadly speaking, zoning for biodiversity conservation is essentially based on habitat distribution, while zoning for conflict resolution is based on distribution of human uses (and perceptions of the relative value of these uses). Human uses are dynamic processes driven by social and economic factors and do not necessarily match ecological habitat distribution.

Conservation agencies promote zoning of multiple-use MPAs as the most equitable way to manage human uses. However, spatial zoning would only be equitable if all users extracted the same economic or social benefits from a given area. A fishing ground may be essential to a particular fishery/fisher, but marginal to another. Also, some fishers will be technically and economically more able than others to redistribute their fishing effort to distant grounds or to other fisheries. A bioeconomic study of marine sanctuaries (Holland 2000) concluded that the design of no-take areas should consider both fish and fishers' behaviour in a given fishery to avoid unequal

and unintended impacts on different groups of fishers. Rather than resolving users' conflicts, zoning may in fact exacerbate them, not only within MPAs and but also outside MPAs if effort displacement occurs.

Spatial zoning may also interfere with existing fishing rights. Some users (eg. commercial fishers) may have already been allocated rights in one form or another (licence, quota), while other users have not (eg. recreational fishers). Most conservation advocates strongly believe that fishers have no rights over a common resource. It is outside the scope of this study to discuss the advantages, or otherwise, of allocating fishing rights (see http//www.fishrights99.com.au for pros and cons about fishing rights). However, it must be recognised, that fishing rights are not just privileges, they are management tools associated with heavy regulations and costs to individual commercial fishers.

Fisheries agencies across Australia are currently investigating how to use spatial zoning as a resource allocation mechanism to manage long-standing conflicts between the recreational and commercial fishing sectors (Fisheries WA 2000, NSW Fisheries 2000). One of the issues is whether to allocate fishing rights, and in what form, to the recreational sector (AFFA 1999, Fisheries WA 2000, Kearney 2001).

9.9.2 Compensation

As discussed above, there is a conflict between the increased use of fishing rights/access in Australia's fisheries management and the potential loss of fishing grounds from the development of MPAs for biodiversity conservation, and this raises important compensation issues. The potential costs to the community of compensation generate important and complex philosophical and ethical issues with regard to the value and role of commercial fisheries (including the value of fishing rights when they exist). Unfortunately, the community is mostly unaware or poorly informed about these fisheries issues (Leadbitter *et al*. 1999).

Some MPA advocates are in favour of compensating fishers when displaced by MPAs (Roberts and Hawkins 2000). However, others are against the idea and claim that fishers will be compensated for loss of access to fish resources by the benefits that MPAs will, supposedly, bring to fisheries. As seen in chapter 7, such claims are largely uncertain and circumstantial. At the same time, the general lack of commitment from governments to either assess socio-economic impacts of MPAs on fisheries, or monitor whether or not MPAs deliver fisheries benefits, significantly contributes to fishers' scepticism. As described by Tsamenyi and McIlgorm (1999), there is no 'sugar-coating' for industry with the development of MPAs.

The Oceans Policy accepts that economic instruments will be incorporated where they can assist management for ecologically sustainable fisheries. The national guidelines for the NRSMPA also recognise that compensation is one issue that needs to be considered and resolved by each jurisdiction. Today however, negotiations on MPAs are still hampered by the lack of clear government policies with regard to compensation to fishers. Government conservation agencies across Australia are not able to provide a clear position on this issue because the position of their own political representatives is unclear.

At the Commonwealth level, section 51, subsection 31 of the Australian Constitution requires that compensation be paid when properties are acquired by government. However, in the case of commercial fishing, the commonwealth believes that there is no legal basis to pay compensation to holders of fishing concessions granted under Commonwealth or State fisheries laws. This is because a prohibition or restriction of the exercise of rights under statutory fishing concessions in a Commonwealth reserve is not regarded as an acquisition of property in the meaning of S51 (ss31) of the constitution. Instead, the Commonwealth relies on consultation with stakeholders to ensure that their interests are accommodated as far as possible and that negative socio-economic impacts of MPAs are minimised.

At the State level, the recent withdrawal of the ECC MPA proposal in Victoria can be largely attributed to the government's mis-handling of compensation issues (chapter 6). Western Australia is the only jurisdiction in Australia where compensation for loss of fishing rights has been legislated (chapter 6). In this State, conservation and fisheries agencies and the commercial fishing industry all agree that the compensation Act has resulted in a more rigorous approach to the planning of MPAs and helped improve negotiations (note that the compensation Act was not triggered during the planning of the Jurien Bay Marine Park). Fishers regard this legislation as a safeguard to ensure that they will be properly consulted. In turn, they become more confident and willing to participate in government MPA planning.

Contrary to popular belief, having compensation legislated has not made fishing rights any stronger in Western Australia. Indeed, the value and strength of fishing rights vary between fisheries and in most Australian fisheries Ministers still have the legislative power to abolish fishing rights such as licences (see Tsamenyi and McIlgorm 1999 for a review of fishing rights in Australia). Some sectors of the commercial fishing industry are concerned that to legislate compensation does not sufficiently protect the fishing industry if fishing rights are not secured.

It is also important to point out here that the majority of commercial fishers across Australia view actual compensation as a last resort. What they want first of all is to maintain their livelihood and work out a compromise between maintaining fishing activities and protecting the marine environment. The ASIC policy on MPAs (Appendix 10) shows that compensation does not have to be in monetary terms. Compensation mechanisms should rather be designed to help restructure the commercial fishing industry and limit the negative impact of effort displacement that may result from the implementation of MPAs.

The commercial fishing industry is also concerned with the inequity that some compensation mechanisms can create between users of fish resources. The ongoing closure of commercial fisheries and re-allocation of fish resources to recreational fishers through compulsory buy-back of commercial fishing licences in NSW estuaries is a contentious example.

9.10 MONITORING AND PERFORMANCE MEASURES

The number of MPAs is growing worldwide, but it is still unclear how effective they are (MPA News February 2001). Many MPAs worldwide (80-90%) exist on maps and in legislation but offer little real protection in the water (Attwood *et al*. 1997, MPA News June 2001). These 'paper parks' reflect ineffective management.

The World Conservation Union (IUCN) recently published a report suggesting methods for evaluating the successes and shortfalls of individual MPAs and MPA networks (IUCN 2000). Providing step-by-step advice, the report is designed to be used at different assessment levels, from relatively quick evaluations at the national level to detailed monitoring at each site. The Fisheries Centre of the University of British Columbia is also working on adapting the evaluation technique known as Rapfish ('Rapid Appraisal for the Status of Fisheries'), initially developed for evaluating the sustainability of fisheries, to evaluate the performance of MPAs (MPA News August 2000).

The 2000 IUCN report pointed out that 'first and foremost, evaluation should be seen as a normal part of the process of management'. According to the authors of the report, performance evaluation for MPAs has encountered some resistance from managers who are generally concerned that the tool will be used primarily to watch and blame them for inadequate performance (MPA News February 2001).

In Australia, government documents on MPAs generally provide no detail on monitoring arrangements once MPAs have been implemented (eg. ECC 2000, QPWS 2000). Experience with existing MPAs shows that, because of lack of staff and financial resources, the management of individual MPAs is often limited to assessing applications for new activities (eg. tourism development) and allocating permits. A study of *Best Practices in Performance Reporting in Natural Resource Management* (ANZECC 1997) found that, overall, little progress has been made in natural resource management in Australia with regard to assessing and reporting performance against targets (particularly at the individual park level).

Conservation agencies are mostly concerned with the effective establishment of networks of MPAs in their jurisdiction. As a result, the number of MPAs being implemented tends to become the key performance measure with regard to biodiversity conservation (eg. ANZECC TFMPA 1999). By contrast, the commercial fishing industry is more concerned with the scientific monitoring and performance of individual MPAs in their local area. They do not understand governments' lack of commitment to address these monitoring issues. Given the uncertainty about the performance of MPAs, and governments' lack of commitment to monitoring, fishers are concerned about the secure tenure of MPAs (once they are declared, MPAs can only be revoked by a parliamentary process).

Again, it is important to distinguish the scientific aspect from the management aspect of MPA performance. The number of declared MPAs at the network scale is more a measure of management performance than a measure of ecological performance. This appears to be a common problem with monitoring programmes (eg. CALM 2000), which are often designed as audit programmes rather than scientific monitoring programmes. They are designed to check that an action supposed to fix a problem has been implemented rather than to check that this action is indeed effective in fixing the problem. Having declared a given number of MPAs in a network does not necessarily prove that the network approach is effective in protecting biodiversity. Designing meaningful monitoring programmes is made more difficult by the fact that the nature of the problem (ie. threat to biodiversity) is itself poorly defined. Clear definition of a problem and setting clear objectives is the first step in developing and then testing hypotheses regarding the effects of an MPA.

In Australia, management plans for MPAs are developed after their declaration, except in Western Australia where the legislation requires that an indicative management plan (IMP) be prepared for each MPA prior to its declaration (see chapter 6). The perceived success of the Western Australian MPA planning process is

partly due to having management plans, including information on monitoring and enforcement arrangements and costs, designed before an MPA is declared.

9.11 ENFORCEMENT AND COMPLIANCE

Ward *et al*. (2001) found that, in the case of marine reserves implemented for fisheries purposes, potential benefits to fisheries were dependent on compliance with regulations and that even relatively low levels of illegal fishing were enough for the reserves to fail. A recent evaluation of the effectiveness of MPAs in Victoria, Tasmania, South Australia and New Zealand found that failure to implement day-to-day management because of lack of resources was a major constraint on effectiveness (Porter 1999). On the other hand, advocates of MPAs claim that no-take areas are easier to manage and enforce than multiple-use reserves because no human activity is easier to enforce than limited activities (Ballantine 1991, Ward *et al*. 2001).

The proper enforcement of MPAs is of particular importance to the commercial fishing industry. From commercial fishers' point of view, the key issues are:

- proper enforcement is needed to ensure that the performance of MPAs is not jeopardised by illegal fishing;
- proper enforcement ensures equity between users;
- agencies' responsibilities for enforcement costs must be clarified and commensurate to the objectives of MPAs and expected benefits (ie. commercial fishers are reluctant to bear the costs of enforcing MPAs that are declared purely for biodiversity conservation, in addition to losing access to their fishing grounds); and
- details of enforcement arrangements and associated costs need to be clarified before the declaration of an MPA.

It is well recognised that increasing users' sense of ownership and stewardship towards the marine environment is paramount to the success of any regulations, including those related to MPAs. Most government policies identify education and users' participation in MPA planning as the two key strategies to promote stewardship and limit enforcement needs (MPA News November 2000, DFO 1997, MMIC 2001). However, education for compliance purpose is too often understood as distributing information on existing regulations. This is not sufficient to promote real stewardship.

For example, Sutinen and Kuperan (1999) showed that the willingness to comply with regulations is partly based on the perceived legitimacy of the authorities charged with

implementing these regulations. They also showed that a key determinant of perceived legitimacy is the fairness built into planning procedures (equity and efficiency of regulation are complementary). Another study (Mascia 2000) analysing institutional arrangements for MPAs showed that positive social and biological outcomes for MPAs were correlated with well-defined resource-use rights, accessible conflict-resolution mechanisms, and users' self-governance rights.

9.12 INDUSTRY PARTICIPATION[18] IN MPA PLANNING

It is well documented that to achieve effective natural resource management and conservation outcomes with minimal conflict and long-term community support requires the involvement of those directly affected by management measures (Fiskes 1992, Crosby 1997, Neis 1995, Well and White 1995, Beaumont 1997; Hall 1999, Pomeroy and Berkes, 1997, Badalamenti *et al*. 2000, Johnson and Walker 2000).

Stakeholders' participation in natural resource management decision making is increasingly being institutionalised through legislation. Most environment acts today include requirements for public participation. As observed elsewhere (Beaumont 1997), government policies on resource management never fail to mention the importance of stakeholders' participation, but they rarely provide practical details and critical account of approaches taken. Current consultation practices rely essentially on distributing written information (letters, articles, education leaflets) to the community at large, organising public meetings, and calling for public submission to discussion papers. This is not appropriate to adequately address the commercial fishing industry's specific needs.

The national guidelines themselves were developed by the ANZECC Task Force on MPAs with apparently little consultation with, and input from the commercial fishing industry. As at April 1999, the ANZECC Task Force on MPAs comprised 22 members, all representing government agencies, most of which were conservation agencies. The membership comprised 15 conservation agencies, 2 Commonwealth research organisations, and 5 fisheries management agencies (surprisingly fisheries

[18] There is a large amount of literature explaining the differences between stakeholder consultation and participation, with respect to participants' roles and responsibilities and with respect to power sharing arrangements. There are also important distinctions to make between the objectives of participation in wealthy developed countries and in developing countries. These are indeed very important issues that need to be addressed by anyone wanting to develop protocols for the involvement of stakeholders in natural resource management. However, these issues are outside the scope of this study and in this report both terms consultation and participation are used with the same meaning.

agencies from Western Australia, Queensland and the Commonwealth were not represented).

The national guidelines include generic statements such as 'the processes of identification and selection of MPAs will include effective and high-quality public consultation with appropriate community and interest groups, to address current and future social, economic and cultural issues'. However, experience shows that there are generally limited resources and expertise, and sometimes limited willingness, within government agencies to design and engage in effective consultation with the commercial fishing industry.

Government policies tend to expect more and more from consulting with fishers. Consultation is expected to resolve many different issues: eg. provide expert environmental knowledge, provide socio-economic information and assist integrated management by reducing conflict between users. While the scope of industry consultation is expanding, there is no dedicated research designing effective consultation (except in Western Australia). The Strategic Plan of Action described in chapter 5 includes several actions dealing specifically with 'harnessing' stakeholders' knowledge (Action 13), improving their involvement in MPA planning processes (Action 22), and developing models for the fishing industry's involvement in the monitoring and management of MPAs (Action 30). However, there is little information available to date on the progress of these actions.

Stakeholders' participation in government MPA planning processes only begins after candidate areas have been identified by scientists. At that time, fishers are asked to negotiate the location and size of these candidate areas, including the impacts on their fishing activities, with little understanding of why or how these areas were chosen in the first place. Commercial fishers are the users of marine resources the most impacted by MPAs and they want more effective and genuine consultation dedicated to resolving fisheries issues.

10 TOWARDS A COMMERCIAL FISHING INDUSTRY COORDINATED RESPONSE TO MPAs

One of the main objectives of the project was to provide representatives of the commercial fishing industry peak bodies with information and guiding principles to assist them in developing a collective understanding of, and consistent response to, the development of MPAs. Information regarding governments' MPA planning processes and industry's concerns was reviewed and analysed extensively in the previous chapters. In this chapter, we suggest to industry some guiding principles for developing a coordinated approach to MPAs. The principles are of two types: broad and generic principles aimed at establishing agreed best practices, and more detailed principles in the form of a check-list of critical issues.

10.1 BROAD GUIDING PRINCIPLES

10.1.1 Industry national framework

Increasingly, Australian Governments address conservation issues through developing national agreement, of which the development of the NRSMPA is an example. The NRSMPA is gaining credibility with the Australian community because it is presented as an initiative endorsed nationally by all governments. The commercial fishing industry lacks national infrastructure to adequately and consistently respond to such government national initiatives.

The commercial fishing industry has minimal representation at the national level. ASIC, the national peak industry body, has limited full-time staff and a restrictive budget. Industry representatives on ASIC, despite their most enviable commitment to the principles of the national peak body, have many other responsibilities and are often distracted by compelling and urgent issues closer to home. Industry's concerns with MPAs, and the importance and urgency of MPAs issues, also differ between jurisdictions according to specific circumstances. Some of the key differences between States that hamper national coordination include:

- differences in the structure, market value, and management regime of commercial fisheries;

- differences between the types of marine ecosystems, their health status and perceived/real fishing impacts[19]; and
- differences in government approaches to some critical principles (eg. multiple-use, compensation, stakeholders' consultation, etc).

In addition to differences in State circumstances, the Commonwealth MPA initiative raises national issues for industry. It is clear that State industries across Australia share concerns about the potential impacts of MPAs. For example, many commercial fisheries will likely have to resolve MPA-driven compensation issues at some time or other. The general lack of clear government policy on compensation gives the industry an opportunity to initiate a debate with governments, and a national industry approach would help define agreed principles. Other important and related issues for which a collective industry's position is needed at the national level include resource access security, resource re-allocation between users, and jurisdictional responsibilities between conservation and fisheries agencies.

The industry needs to develop a national framework in order to:

- strengthen industry's voice, reflecting well thought through principles and best practices regarding the conservation of marine resources;
- better demonstrate the legitimacy of industry's needs and interests; and
- better define who industry represents and what are its expertise and principles; this would facilitate communication and cooperation with government agencies and other stakeholders.

Industry groups across Australia have already produced a large amount of work in relation to MPAs. Industry would benefit from consolidating and coordinating at least some aspects of this work. Sharing experience would help optimise returns from limited resources.

10.1.2 Balanced MPA debate

Much of the conservation message embodied in the promotion of MPAs is valid and reflects legitimate concerns and uncertainties from the wider community. However, in Australia there is currently an imbalance in the use of MPAs for management of marine resources. The needs for conservation and the needs for resource use are not clearly identified, and today conservation interests are being given priority. The environmental message is mostly coming from outside the commercial fishing

[19] Not all commercial fisheries are under the same pressure from conservation agencies, and in particular from the Commonwealth government, making some industry sectors less concerned about MPA issues.

industry, which consequently is perceived as resisting change. It is essential for industry to come to terms with the rapid changes that are required to address environmental issues and to be more pro-active.

In particular, the shift from a single species/issue approach to an ecosystem-based approach, and the reliance on the precautionary principle, which are both at the core of the development of MPAs, reflect a philosophical shift in natural resources management. This is having important implications for the assessment and management of fisheries. One of the challenges for industry is to ensure a more balanced debate on the impacts of fishing on the environment. Such a debate needs to be based on acceptance that some level of impact is unavoidable in using natural resources, on agreement about what level of impact is acceptable, and on assessment of what is the current level of impact.

There are opportunities for industry and government for working together. To effectively have input in government MPA processes, including questioning them when necessary, industry members need to be well informed of the principles and procedures involved. They should realise that many government employees in conservation agencies have limited expertise in fisheries issues and that explanation and education will often help. By demonstrating how their knowledge and expertise could assist government processes, industry members would be in a better position to influence rather than oppose these processes.

As seen in the previous chapters, the principles and practices underlying government MPA processes are generally poorly defined and this contributes significantly to industry's difficulties in developing a coordinated response. Fisheries research and management agencies should be more involved in the MPA debate, as industry needs their advice on the potential impacts of MPAs on fisheries management. The role that MPAs could play in Australian fisheries management needs to be more clearly defined. In particular, industry and fisheries management agencies need to work together to develop policies on issues of access security, fisheries re-structuring and compensation, and to develop appropriate mechanisms for their implementation.

Finally, industry should not wait for definitive biological research results before engaging in MPA negotiations with government agencies. Scientific understanding of how MPAs work is generally limited or uncertain, and will remain so for some time. Biological research is a slow process, and it does not by itself answer many of industry's socio-economic and equity concerns.

10.2 CHECK-LIST OF CRITICAL ISSUES

In practice, State industries have to deal with the implementation of individual MPAs, or regional networks of MPAs, on a case by case basis. Deficiencies in MPA processes, which are common across Australian jurisdictions, have been identified and itemised in the check-list below. The check-list also identifies issues for which the commercial fishing industry has responsibilities. It was developed using input from industry representatives, and its aim is to provide a framework to assist industry in reviewing and negotiating individual MPA proposals. It is important to realise that the check-list is a living document and that its content will need to evolve and change as circumstances change.

Check-list of critical issues to be considered by the commercial fishing industry for each MPA proposal.

INDUSTRY CONCERNS WITH MPA PLANNING PROCESSES AND MANAGEMENT PLANS

GENERAL PRINCIPLES

- For each MPA, establish whether it is to be used primarily as a tool for biodiversity conservation or fisheries management;
- Establish the objectives of an MPA both locally and as a component of a national representative system;
- Establish whether the selection and planning of MPAs are to be done sequentially for individual MPAs or simultaneously for all MPAs within a network;
- Acknowledge that, if an MPA is primarily used for biodiversity conservation, it may have little, if any, benefits to fisheries;
- Acknowledge that an MPA may have significant impacts on individual fishers, localised fish stocks and their management;
- Acknowledge that there should be mechanisms to compensate fisheries/fishers that are adversely impacted;
- Identify all threats to the marine environment, and hence to an MPA, from land- and sea-based activities, and assess their relative importance;
- Ensure that the precautionary principle is used properly, ie. is related to properly identified threats and associated risks;
- Establish how an MPA will assist in addressing conservation needs at catchment level;
- Ensure that the science used, or referred to, is valid and relevant.

TECHNICAL ISSUES

Identification and selection of MPAs:

- Has a gap analysis been done, identifying environmental values and their vulnerability, and identifying conservation needs at the relevant regional and local scale?
- Are the specific criteria and scientific approaches used to select an MPA adequate and appropriate?
- What are the criteria for representativeness at the regional scale and does an MPA meet these criteria?
- Have existing closed areas been considered for inclusion in a network of MPAs?
- Has the 'least socio-economic cost' principle been applied to choose between similar candidate areas?
- Have the potential socio-economic impacts of MPAs on fisheries been properly assessed, including flow-on effects, and distinguishing short- and long-term effects?
- Are timeframes and allocated resources sufficient to effectively undertake selection, consultation and subsequent management?

Design of an MPA management plan (including zoning):

- Has there been adequate consultation on designing a management plan for the MPA before its declaration?

- If the MPA is designed primarily for biodiversity conservation, have zoning and associated resource (re-) allocation issues clearly been tied to conservation needs and not to allocation imperatives?
- Is the zoning between users equitable?
- Does the MPA management plan:
  - Clearly describe objectives for each zone in relation to environmental values and threats to them?
  - Clearly relate the size, location and regulations of each zone to its specific objectives?
  - Clearly describe and quantify the likely impacts on fisheries?
  - Include a well designed monitoring programme with practical performance measures (eg. clearly describing what is being monitored, what experimental design is being used, and giving a timeframe for expected results)?
  - Include an audit mechanism to regularly review the effectiveness of the management plan?
  - Describe actions to be taken by government agencies if the MPA is found not to reach its objectives (eg. to modify the design of the MPA or to eliminate it)?
  - Include adequate compliance measures; specifically education and enforcement?
  - Have opportunities for the fishing industry's participation in management (monitoring and compliance) been explored?
  - Detail resource needs to manage the MPA?
  - Describe agreements on how different jurisdictions share management responsibilities and costs?

Consultation with fishing industry stakeholders:

- Is the community consultation process adequate?
- Does the process ensure adequate consultation with fisheries stakeholders:
  - Are fisheries management issues adequately covered by input from fisheries agencies?
  - If fisheries legislation is overridden by conservation legislation when implementing an MPA, are the implications for fisheries management adequately accommodated?
  - Are scientific issues adequately covered by input from fisheries scientists with local expertise?
  - Have members of the fishing industry, local and peak bodies representatives, been adequately consulted?
  - Are the protocols to analyse public submissions adequate?

ISSUES FOR WHICH THE FISHING INDUSTRY HAS RESPONSIBILITIES

Develop a full understanding of MPA issues and a consistent and pro-active response to government initiatives:

- Have a clear understanding of ESD principles, ecosystem and integrated (multiple-use) management, and a clear understanding of associated government processes (policy guidelines, legal responsibilities and political constraints);

- Ensure that industry's responses to MPAs:
  - Reflect well thought through principles and best practices and an industry's commitment to environmental conservation;
  - Promote industry's expertise;
  - Are relevant to government processes and imperatives and help governments understand the full implications of MPA potential impacts on fisheries;
  - Assist the development of new legislation to protect industry's interests.
- Ensure that industry's responses:
  - Identify and prioritise industry objectives with MPAs, at regional and national levels;
  - Include mechanisms for industry peak bodies to share experience and expertise and optimise fisheries organisations' limited human and financial resources;
  - Involve grass-root fishers at local levels and ensure that they are sufficiently informed on MPAs principles and role, and on government process (eg. create local MPA industry committees to ensure continuous communication and transfer of information between executive and grass-root levels).

Actively seek support from fisheries agencies:

Collaborate with fisheries agencies to build strong and valid arguments regarding:

- The need to recognise the fishing industry's role as a food producer and as a key stakeholder (ie. most impacted) in marine resource management;
- Clarification of the nature and extent of fishing impact and associated risks for the environment;
- The need to recognise the impacts of MPAs on existing fishing rights and socio-economic values;
- The need to recognise the impacts of MPAs on the effectiveness of existing fisheries management (eg. through fishing effort displacement).

Actively seek support from fisheries scientists:

- Seek best possible expert opinion from local fisheries scientists;
- Obtain input from recognised independent experts.

Promote the value of industry's involvement in MPA development:

- Provide unbiased, relevant and timely expert information to demonstrate how government agencies would benefit from better and dedicated consultation with industry;
- Nominate key contacts within the industry to ensure sustained and consistent liaison with government agencies.

Improve industry's image and redress government and community misconceptions: • Identify and suggest to government agencies best mechanisms to ensure proper industry consultation, involving both the executive and grass-root levels; • Capitalise on the success of previous national and regional industry initiatives toward environment conservation; conduct an audit of these initiatives and keep ministers and the community well informed about their success; • Conduct a gap analysis of industry's responses to the community's concerns about fishing impact on the marine environment; • Recognise that government agencies and conservation groups may be mis-informed and be prepared to spend time educating them on fisheries issues.
Seek human and financial resources to properly address MPA issues and effectively support a national industry strategy.

11 CONCLUSIONS

Information available in Australia and overseas on current MPA issues has been reviewed and analysed, with particular regard to the commercial fishing industry's concerns with MPAs, scientific opinion and government policy and planning processes. This report is intended as a reference document for the Australian commercial fishing industry, providing in depth analysis, as well as technical information on MPA development. Its aim is to assist industry in developing a coordinated response to the development of MPAs, through better and more uniform understanding of the principles and practices driving government MPA processes.

Industry's ability to develop a consistent approach to MPAs throughout Australia has been hampered by confusion within Commonwealth and State governments over the objectives of MPAs, and lack of definition of who has responsibilities for the impacts, positive and negative, they may have on fisheries. Conservation agencies, in accordance with their mandated responsibilities and under the guidance of Environment Australia, are justifiably and actively promoting the biodiversity benefits of MPAs. However, fisheries management implications of MPAs have been largely ignored. The assessment of the impacts of MPAs on commercial (and recreational) fisheries, and the management of these impacts, is the responsibility of State and Commonwealth fisheries agencies, but to date these agencies have shown limited engagement with the development of MPAs. Governments have not provided research and assessment of the fisheries implications of MPAs, which would underpin advice to industry and provide a focus for debate and consultation between proponents of MPAs and the fishing industry.

In all jurisdictions, this situation has created an imbalance within governments between the needs for environmental conservation using MPAs and the needs for sustainable use of fish resources. This project has identified these deficiencies and initiated discussion within the Commonwealth government on committing extra resources to address them. At the same time the project has identified issues with which the industry must show more initiative. The suggestions made to the commercial fishing industry are based on three main conclusions:

- The development of MPAs in Australia has the potential to impact on *all* fisheries and industry members need to recognise the national dimension of this environment protection initiative. The declaration of MPAs, which appears to have predominantly localised consequences, may well set precedents or have flow-on effects across jurisdictions;

- Each MPA proposal represents a set of unique circumstances (ecological, administrative, and political) and the commercial fishing industry, locally and regionally, may require assistance with each and every one of the many different MPA proposals being considered throughout Australia; and
- If there is to be national coordination, or even complementarity, of the industry's responses to MPAs, then industry will need to dedicate additional resources, and a person (or persons) may be required as industry national facilitator(s).

12 BENEFITS

The project is of primary benefit to Australia's marine and estuarine commercial fishers. Management and conservation agencies also benefit from having a better understanding of the commercial fishing industry' concerns with marine protected areas.

13 FURTHER DEVELOPMENT

Industry's ability to develop a consistent approach to MPAs throughout Australia has been hampered by confusion within Commonwealth and State governments over the objectives of MPAs, and lack of definition of who has responsibilities for the impacts they may have on fisheries. Governments have not provided research and assessment of the fisheries implications of MPAs, which would underpin advice to industry and provide a focus for debate. This project has identified these deficiencies and initiated discussion within the Commonwealth government (AFFA) on committing extra resources to address them.

Also, mis-conceptions and unclear messages about the objectives and performance of MPAs, and lack of clear planning process create many difficulties during MPA negotiations between the fishing industry and government agencies. The in-depth analyses conducted in this study are timely and can assist both sides of the debate in developing a uniform understanding of MPA issues. It would be much beneficial to undertake extension work to make this report accessible to a wider audience. For example, a booklet summarising the findings of this study could be produced and widely distributed. The findings could also be disseminated through workshops targeted at both the fishing industry and government agencies.

14 STAFF

NAME	POSITION	% OF TIME
Professor Robert Kearney	Principal Investigator	15
Mr Daryl McPhee	Senior Project Officer	10
Dr Pascale Baelde	Project Leader	100
Ms Cathy Francis	Research Assistant	25

APPENDICES

APPENDIX 1

LIST OF AGENCIES AND ORGANISATIONS VISITED	DATE
ACT	
Fisheries Research and Development Corporation	16/09/1999; 16/12/1999
Environment Australia	22/09/1999; 16/12/1999; 17/01/2001
Australian Fisheries Management Authority (Environmental Section)	29/09/1999; 07/12/2000
Australian Seafood Industry Council	10/04/2000; 23/10/2000
WESTERN AUSTRALIA	
Fisheries Western Australia	15/11/1999; 11/12/2000
Western Australian Fishing Industry Council	15/11/1999; 13/12/2000
Department of Conservation and Land Management	16/11/1999; 12/12/2000
Western Australian Fishing Industry Council	17/11/1999
Australian Marine Conservation Society	17/11/1999
MG Kailis Group (Industry)	18/11/1999
SOUTH AUSTRALIA	
Primary Industries and Resources SA	18/04/2000
South Australian Fishing Industry Council	18/04/2000
South Australian Rock Lobster Advisory Council	18/04/2000
South Australian Research and Development Institute	19/04/2000
Department for Environment and Heritage	19/04/2000
Tuna Boat Owners Association of Australia	20/04/2000
VICTORIA	
Victorian National Parks Association & Marine and Coastal Community Network	08/11/1999
Seafood Industry Victoria	09/11/1999
Natural Resources and Environment	09/11/1999
Marine and Freshwater Research Institute	24/03/2000
TASMANIA	
Marine and Marine Industry Council	13/03/2000
Department of Primary Industries, Water and Environment (Parks and Wildlife Service)	14/03/2000
Tasmanian Aquaculture and Fisheries Institute	14/03/2000
Department of Primary Industries, Water and Environment (Marine Resource Division)	15/03/2000
Tasmanian Fishing Industry Council	16/03/2000
Marine and Coastal Community Network	15/03/2000
Tasmanian Rock Lobster Fishermen's Association	15/03/2000

NEW SOUTH WALES	
National Parks and Wildlife Service	17/07/2000
Ocean Watch	18/07/2000
NSW Fisheries (Port Stephens Fisheries Centre)	19/07/2000
Marine Parks Authority	19/07/2000
Commercial Fishermen's Co-operative Limited	20/07/2000
NSW Seafood Industry Council	20/07/2000
United Commercial Fishermen's Association of NSW	20/07/2000
NSW Fisheries (Cronulla Fisheries Centre)	21/07/2000
University of Wollongong (Centre for Maritime Policy)	25/09/2000
NORTHERN TERRITORY	
Northern Territory Seafood Council	15/05/2000
Parks and Wildlife Commission	16/05/2000
Department of Primary Industry and Fisheries	16/05/2000; 18/05/2000
Amateur Fisherman's Association Northern Territory	18/05/2000
QUEENSLAND	
CRC Reef Research Centre (James Cook University)	24/05/2000
Great Barrier Reef Marine Park Authority	25/05/2000; 26/05/2000
Queensland University (Zoology Department)	30/05/2000
Queensland Parks and Wildlife Service	30/05/2000
Queensland Seafood Industry Association	31/05/2000; 16/06/2000
Queensland Fisheries Service	31/05/2000

APPENDIX 2

Summarised designations of 'marine area closures' in Australia

Designation	*Number*	*Area (ha)*	*Jurisdiction*
Aquatic Life Reserve	2	279	NT
Aquatic Reserve	21	16 653	NSW, SA
Fish Habitat Area	73	582 553	QLD
Fish Sanctuary	2	3 330	QLD
Historic Shipwreck	10	973	Cwth
Marine National Nature Reserve	5	2 029 484	Cwth
Marine Nature Reserve	4	748 907	TAS, WA
Marine Park	16	35 334 175	Cwth, NT, QLD, WA
Marine Reserve	8	101 364	Cwth, NSW, VIC
Other Parks (unnamed)	6	46 910	VIC
Whale Sanctuary	1	43 730	SA
Total	***148***	***38 908 358***	

(From Cresswell and Thomas 1997)

Number of Marine Protected Areas in each IUCN Category in Australia

IUCN Category	*Number*	*Area (ha)*
Ia	16	2 779 192
II	16	69 080
IV	80	586 334
V	7	4 716 993
VI	23	35 426 842
Unspecified	6	46 910
Total	***148***	***38 908 358***

(From Cresswell and Thomas 1997)

APPENDIX 3

SUMMARY AND OBJECTIVES OF 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.

Objectives:

- to preserve habitats, ecosystems and species in as undisturbed state as possible;
- to maintain genetic resources in a dynamic and revolutionary state;
- to maintain established ecological processes;
- to safeguard structural landscape features or rock exposures;
- to secure examples of the natural environment for scientific studies, environmental monitoring and education, including baseline areas from which all avoidable access is excluded;
- to minimise disturbance by careful planning and execution of research and other approved activities; and
- to limit public access.

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 so as to preserve its natural condition.

Objectives:

- to ensure that future generations have the opportunity to experience understanding and enjoyment of areas that have been largely undisturbed by human action over a long period of time;
- to maintain the essential natural attributes and qualities of the environment over the long term;
- to provide for public access at levels and of a type which will serve best the physical and spiritual well-being of visitors and maintain the wilderness qualities of the area for present and future generations; and
- to enable indigenous human communities which are living at low density and in balance with the available resources to maintain their lifestyle.

CATEGORY II NATIONAL PARK: PROTECTED AREA MANAGED MAINLY FOR ECOSYSTEM CONSERVATION AND RECREATION

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

- protect the ecological integrity of one or more ecosystems for this and future generations;
- exclude exploitation or occupation inimical to the purposes of designation of the area; and

- provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible.

Objectives:

- to protect natural and scenic areas of national and international significance for spiritual, scientific, educational, recreational or tourist purposes;
- to perpetuate, in as natural a state as possible, representative examples of physiographic regions, biotic communities, genetic resources and species, to provide ecological stability and diversity;
- to manage visitor use for inspirational, educational, cultural and recreational purposes at a level that will maintain the area in a natural state or near natural state;
- to eliminate and thereafter prevent exploitation or occupation inimical to the purposes of designation;
- to maintain respect for the ecological, geomorphologic, sacred and aesthetic attributes which warranted designation; and
- to take into account the needs of indigenous people, including subsistence, in so far as these will not adversely affect the other objectives of management.

CATEGORY III NATURAL MONUMENT: PROTECTED AREA MANAGED FOR CONSERVATION OF SPECIFIC NATURAL FEATURES

Area containing one or more specific natural or natural/cultural features which are of outstanding value because of inherent rarity, representative or aesthetic qualities or cultural significance.

Objectives:

- to protect or preserve in perpetuity specific outstanding natural features because of their natural significance, unique or representational quality, and/or spiritual connotations;
- to an extent consistent with the foregoing objective, to provide opportunities for research, education, interpretation and public appreciation;
- to eliminate and thereafter prevent exploitation or occupation inimical to the purpose of designation; and
- to deliver to any resident population such benefits as are consistent with the other objectives of management.

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 so as to ensure the maintenance of habitats and/or to meet the requirements of specific species.

Objectives:

- to secure and maintain the habitat conditions necessary to protect significant species, groups of species, biotic communities or physical features of the environment, where these require specific human manipulation for optimum management;
- to facilitate scientific research and environmental monitoring as primary activities associated with sustainable resource management;
- to develop limited areas for public education and appreciation of the characteristics of the habitats concerned and of the work of wildlife management;

- to eliminate and thereafter prevent exploitation or occupation inimical to the purposes of designation; and
- to deliver such benefits to people living within the designated areas as are consistent with the other objectives of management.

CATEGORY V PROTECTED LANDSCAPE/SEASCAPE: PROTECTED AREA MANAGED MAINLY FOR LANDSCAPE/SEASCAPE CONSERVATION AND RECREATION

Area of land, with coast and seas as appropriate, where the interaction of people and nature over time has produced an area of distinct character with significant aesthetic, cultural and/or ecological 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.

Objectives:

- to maintain the harmonious interaction of nature and culture through the protection of landscape and/or seascape and the continuation of traditional land uses, building practices and social and cultural manifestations;
- to support lifestyles and economic activities which are in harmony with nature and the preservation of the social and cultural fabric of the communities concerned;
- to maintain the diversity of landscape and habitat, and of associated species and ecosystems;
- to eliminate where necessary, and thereafter prevent, land uses and activities that are inappropriate in scale and/or character;
- to provide opportunities for public enjoyment through recreation and tourism, appropriate in type and scale to the essential qualities of the areas;
- to encourage scientific and educational activities that will contribute to the long-term wellbeing of resident populations and to the development of public support for the environmental protection of such areas; and
- to bring benefits to, and to contribute to the welfare of, the local community through the provision of natural products (such as forest and fisheries products) and services (such as clean water or income derived from sustainable forms of tourism).

CATEGORY VI MANAGED RESOURCE PROTECTED AREAS: PROTECTED AREA MANAGED MAINLY FOR THE SUSTAINABLE USE OF NATURAL ECOSYSTEMS

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

Objectives:

- to protect and maintain the biological diversity and other natural values of the area in the long term;
- to promote sound management practices for sustainable production purposes;
- to protect the natural resource base from being alienated for other land-use purposes that would be detrimental to the area's biological diversity; and
- to contribute to regional and national development.

* Reproduced from ANZECC TFMPA (1999) and adapted from IUCN (1994).

APPENDIX 4

Method suggested by CALM (Western Australia) to prioritise marine areas for reservation (illustrative example only)

AREA/CRITERIA	E1	E2	E3	E4	E5	E6	H1	H2	H3	H4	H5	H6	L1	L2	Sum	Priority
Cambridge Gulf	4	5	1	1	1	1	1	1	1	2	1	3	1	1	22	18
Buccaneer Archipelago	5	5	3	1	2	1	2	1	1	2	3	2	1	1	30	14
Roebuck Bay	5	5	1	1	1	1	2	2	1	5	3	3	2	2	36	11
Dampier Archipelago	4	5	3	4	3	5	5	5	5	5	2	1	3	2	52	1
Montebello-Barrow Islands	4	5	3	3	3	5	4	4	4	4	5	1	3	2	50	2
Exmouth Gulf	4	1	3	1	3	1	3	3	1	3	1	1	1	2	28	16
South Ningaloo MP	5	1	1	1	5	1	3	1	1	2	1	3	1	1	27	17
Bernier-Dorre	4	1	1	2	3	5	3	4	1	3	1	2	1	1	32	12
Abrolhos	5	5	2	3	2	1	5	4	5	2	1	1	3	3	42	5
Beagles	4	1	2	1	1	5	3	2	1	5	1	1	2	2	31	13
Jurien	4	1	2	3	1	3	4	5	2	5	5	1	2	2	40	7
Nth SIMP	3	1	2	5	3	2	5	5	5	3	1	1	3	2	41	6
Geographe/Capes/Hardy Inlet	4	1	3	4	3	3	5	2	5	4	2	1	2	1	40	7
Walpole-Nornalup	4	5	2	3	3	5	4	2	3	3	1	1	2	1	39	10
Broke Inlet	5	5	2	2	5	5	5	2	1	3	1	3	5	1	45	3
Albany	3	5	2	2	1	2	3	2	2	2	1	1	2	1	29	15
Fitzgerald	5	5	4	1	5	5	2	5	1	2	3	3	1	1	44	4
Recherché	5	5	4	1	5	5	3	2	1	2	1	3	2	1	40	7

Ecological value (E1)
- Uniqueness
- Representativeness
- Dependency
- Productivity
- Naturalness
- Integrity
- Vulnerability

Comprehensiveness (E2)
Bioregional representation (E3)
The level of existing and/or potential threats (E4)
Functional integrity (E5)
Integration of terrestrial and marine management (E6)

Cultural value (H1)
- Social significance
- Economic significance
- Scientific significance
- International and national values

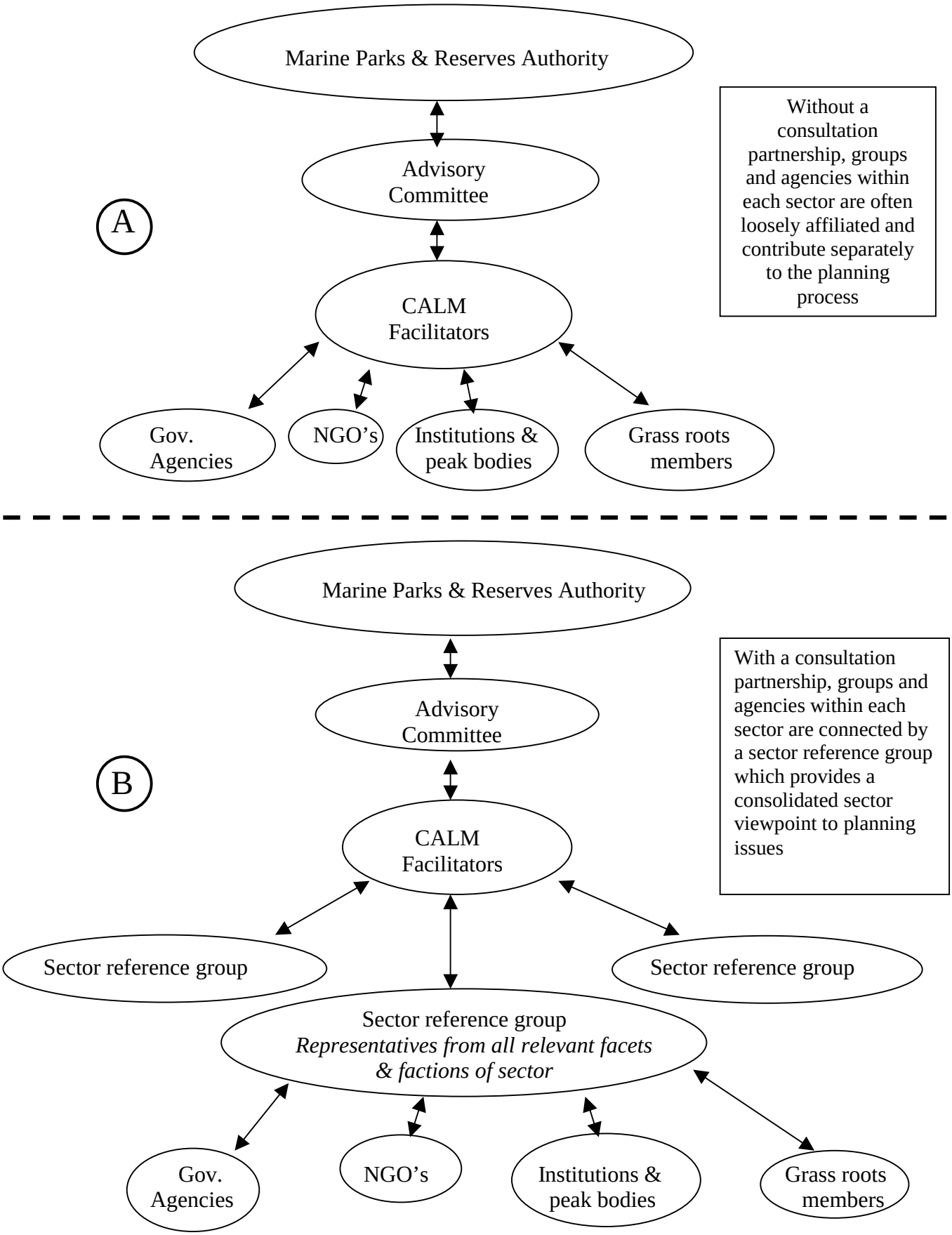
Existing information (H2)
The level of existing and/or potential conflict (H3)
Socio-political considerations (H4)
Strategic importance (H5)
Opportunity (H6)

Linkages to public sector programs (L1)
Linkages to private sector programs (L2)

Reproduced from Simpson and Bancroft 1998. (Criteria can be weighted, the example here is with unweighted criteria)

APPENDIX 5

CALM's community participation process to MPA development in Western Australia



Reproduced from unpublished CALM working documents (1999-2000) (A) Previous community participation process; (B) New process being developed.

APPENDIX 6

South Australia Fishing Industry Council recommendations on MPAs (reproduced from SAFIC 1997)

1. That before MPAs are established, a bio-necessity statement be prepared for each potential MPA.
2. That each bio-necessity statement should clearly demonstrate the biological need to protect the area and should take account of a wide range of information on the biological, economic and social impacts on the community.
3. That integrated management forums which include representatives from the commercial fishing industry be established to consider MPAs in South Australia or Commonwealth waters adjacent to the state.
4. That a process of extensive consultation and negotiation takes place between Government departments, integrated management forums and the commercial fishing industry when MPAs are being considered for South Australian waters or Commonwealth waters adjacent to the state.
5. That where MPAs result in displaced fishing effort, suitable measures be implemented to restore resource sustainability.
6. That the true economic cost of establishing MPAs be determined and appropriate funding for adjustment be made available to the commercial fishing industry by the community.
7. That funding for establishing, implementing and maintaining MPAs be available, adequate and provided by the community.
8. That MPAs be declared under the Acts administered by Government fisheries agencies.
9. That comprehensive management plans be prepared for MPAs by integrated management forums which include representatives from all stakeholder groups.
10. That integrated management forums be provided with expert technical advice from economists, ecologists, fisheries biologists and social scientists.
11. That where MPAs are established, they be classified as multiple-use areas.
12. That legislation be changed to ensure that zones of management within MPAs be clearly defined prior to park proclamation.
13. That, where fishing activities are restricted or excluded in MPAs, these arrangements be applied consistently to include non-commercial groups with an interest in the area.
14. That the resources required to ensure compliance with MPA regulations be identified, adequate and proved to be available before MPAs are established.
15. That where MPAs are established, there be no restriction on the ability for commercial fishers to transit the areas and that traditional mooring arrangements be maintained.

APPENDIX 7

Victorian Fisheries Co-management Council Research Committee's comments on the ECC's Marine Coastal and Estuarine Investigation*

The Committee has restricted its comments to the scientific principles and information used to justify the recommendations of the report. The section dealing with "The case for highly protected areas", included in the Executive Summary (Page xi), is particularly important because it should provide decision-makers with the core arguments underpinning the recommendations of the report, especially as these relate to the high profile Marine National Parks. The Committee has grave concerns about this section because a number of the arguments are scientifically naïve, without rigour and in some instances patently wrong.

The Committee is aware that information to scientifically justify the establishment, location and size of marine protected areas is sparse and expensive to collect. This problem is not unique to Australia. Few people within the community would argue against the establishment of marine protected areas and the absence of detailed scientific information is not sufficient cause for inaction. Rather, commonsense and scientific insights might suffice to enable decisions to be made to protect areas that are large enough to be meaningful and are located appropriately. This up-front approach which acknowledges the lack of information is preferable to the use of unconvincing scientific arguments and inappropriate generalisations to attempt to support recommendations. Unfortunately the draft report tends to downplay the pragmatic approach and has the tendency in many cases to revert to "scientific straw clutching" to attempt to justify recommendations when the required scientific understanding is simply not available.

We believe the community might well be more convinced by a more commonsense and pragmatic approach which does not expose the recommendations to the type of criticism expressed later in this submission.

The sections dealing with the specific areas recommended for marine national parks clearly describe the nature of the habitat representation within the area and this seems to be a major factor driving the selection of the particular areas and their pattern. This justification would be understood by the community and might be accepted as a sufficient argument for the establishment of the park. This rationale is unfortunately not dealt with explicitly in "The case for highly protected areas".

Decisions to establish parks also need to be backed up by an indication that the marine protected areas will be managed and protected in such a way as to ensure that the benefits of their establishment materialise. This issue is inadequately addressed in the report, the only recommendation (R12) being one that suggests that compliance resourcing and strategies be reviewed. There are also some vague comments in the "Management and compliance" section of the information dealing with each Marine National Park but these do not constitute an analysis that would materially assist the decision-makers.

The report would be more helpful to decision-makers if at this stage there was some analysis of the requirements and some consideration of implications for compliance of different configurations of protected areas, for example optimal sizes and other

logistical considerations. Without some guidance on this important issue the decisions to establish the areas recommended are likely to be difficult as the management and financial commitments of these decisions are unknown.

Likewise there is a lack of information on the consequences of the recommendations for fishers whose entitlements will be affected by the recommendations other than estimates of the loss of catch and revenue associated with the recommended closures. The major fisheries involved are abalone and rock lobster. The abalone fishing grounds removed by the recommendations are estimated to account for ten percent of the catch. This equates to about 7 licences with a capitalised value of over $20 million a factor which is not dealt with in the report. The issue is further complicated by the fact that the grounds removed are not specifically fished by individual divers, but rather a number of fishers harvest these areas as part of their total area of operation. The transfer of this significant effort to other grounds is not advisable on stock management grounds. A better appraisal of these issues is required, so that decision-makers are more fully informed of the consequences of the recommendations. Inadequate compensation will certainly lead to litigation, which underscores the need for adequate information on how to deal with displaced fishers. These comments would apply equally to rock lobster and finfish fishers whose entitlements are affected, although the financial implications are not as serious as for abalone.

More specifically, the section dealing with "The case for highly protected areas" which provides decision-makers with the core arguments underpinning the recommendations of the report, is disappointing as the dot points constituting this case are either scientifically superficial or flawed. To illustrate this viewpoint, and hopefully improve this important component of the report the following comments are submitted.

Dot point 1
The text admits that the genetic impact of fishing on stocks is unknown but then uses the argument to justify the establishment of protected areas. In any event the small size of the areas, and the reduction in fishing in relation to the total effort, is unlikely to have any genetic impact, even if fishing was affecting the genetic makeup of the stock. Likewise, with the possible exception of abalone, the argument that the proposed closed areas would be a significant factor in allowing the ecosystem to recover from biomass removal is equally spurious. This claim cannot be made because of the small area of the parks, the lack of information on the proportion of total biomass of all species, the mobility of this biomass and the proportion removed by fishing operations.

Dot point 3
The statement that the recommendations will increase the marine protected areas to 6.2% does not constitute a case for protected areas but rather is a statement of fact. There is no discussion about what percentage could constitute a meaningful contribution to marine conservation or a target. As such the statement has no place in this section and illustrates a lack of rigour in presentation of the case for the establishment of these key areas. The reference to the area of land based National or State parks (Dot point 2) has no relevance due to the totally different considerations in the marine environment.

Dot point 4
The scientific importance of the areas will depend on the degree to which protection can be enforced. If this is not done the scientific observations, that assume effective protection, would be misleading and flawed and this key rationale for establishment of the area would not be valid. In addition any area, whether in a marine park or not, can be monitored rigorously if the resources are provided, so this does not constitute a powerful criteria for the establishment of a park.

Dot point 5
The size of the parks and the magnitude of the marine resources concerned would not suggest that the closure would have any significant impact on the recruitment of important fish stocks. To advance this generalisation as a justification for the parks proposed in the report illustrates a lack of understanding of recruitment dynamics in southeast Australia and in no way can it be assumed that these areas are valuable insurance measures.

Dot point 7
This is a very superficial rationale for the creation of a marine park and in fact belittles the attitude of both commercial and recreational fishers as well as the ability of resource managers to communicate basic fisheries conservation messages.

In view of the above comments it is suggested that this important core section of the report, which should provide the framework and strategic rationale for the recommendations, should be completely redrafted. In its present form the draft exposes the ECC to severe criticism of poor scientific judgement, unacceptable generalisation, selective use of literature and a fundamental lack of understanding of the population and locational dynamics of marine resources and their environment.

On page 32 of the report there is a brief discussion of the scientific basis for marine protected areas and acknowledgment of the paucity of information. The report then suggests that solid scientific evidence of the role of protected areas exists.

The argument "there has been solid scientific evidence that highly protected marine parks can play an important role in the overall marine management and protection of biodiversity and other natural values", as this relates to temperate regions, is derived in part from Edgar and Barrett (1999). The report fails however to mention two important and relevant statements by these authors in their publication that clearly identify the current paucity of scientific information required to substantiate the value of such areas and these are:

"Marine reserves are frequently cited to be amongst the most useful tools available to coastal managers for conserving marine biodiversity, a claim that relies almost entirely on a theoretical basis" and

"…: the tacit acceptance that resource enhancement aims are achieved with the declaration of marine reserves is questionable".

As was stated earlier, the Committee does not believe that the absence of scientific information is sufficient cause not to consider the establishment of marine parks if this has majority community support. However it is highly critical of the selective quoting of sections of one of the only relevant scientific papers dealing with the South east Australian area (Edgar and Barrett) to provide the perception of scientific justification

while ignoring the important and clear statements made in that paper which confirm the lack of this justification.

Certainly if areas are closed to fishing, the reduction in fishing mortality over a large area will influence the size composition of resident species which are subject to fishing, such as abalone and possibly rock lobster depending on the size of the area. This relatively minor and obvious response is a far cry from claims of an impact on biodiversity, more especially taking into account the generally small size of the areas considered in the report which render them irrelevant in commonsense conservation terms.

* ECC = Environment Conservation Council; comments from the ECC's December 1999 draft report, reproduced in full with permission from the chair of the committee (Garth Newman).

APPENDIX 8

The Victorian Government Response to the Environment Conservation Council's Marine, Coastal and Estuarine Investigation Final Recommendations (Extract*)

In response to the ECC recommendation (R1) that 'Government establish a process to evaluate the requirement for, possible mechanisms and level of adjustment that may be required where individuals or local communities are disproportionately affected as a result of the implementation of recommendations for marine national parks and marine sanctuaries'

The Government is committed to establishing a comprehensive, adequate and representative network of marine protected areas in Victoria. Notwithstanding the extensive consultation undertaken in the nine years leading up to the Final Report, the Government has undertaken targeted consultation with key stakeholders, including the Australian Marine Sciences Association, Australian Recreational Fishing Alliance, Dive Industry Victoria Association, Fisheries Co-Management Council, Marine and Coastal Community Network, Mirimbiak Aboriginal Nations Corporation, Rex Hunt Futurefish Foundation, Seafood Industry Victoria, Victorian Aquaculture Council, Victorian Fishing Charter Association, Victorian National Parks Association and VRFish. The Government also met with local representatives from Portland, Geelong, San Remo, Wonthaggi, Corner Inlet, Mallacoota and Lakes Entrance.

After considering the ECC's Final Report and comments raised by stakeholders the Government has developed a number of measures to assist the industry to adjust and relocate their fishing effort as a result of the establishment of marine national parks and sanctuaries.

The measures include:

- Transitional assistance;
- Enhanced enforcement;
- A phase out of fishing in some marine national parks and sanctuaries;
- Adjustments to ECC recommendations to reduce fisheries impacts; and
- Performance assessment and monitoring.

Transitional assistance

The abalone resource is considered relatively healthy, with some capacity to access alternative, new or currently under-utilised areas. Conversely the rock lobster resource is depleted and the capacity of the industry to adjust is low. However, impacts on the rock lobster industry need to be considered in the context of the structural adjustment package being provided as a result of the introduction of a quota management system. Fin fishers have more flexibility to harvest these mobile species in alternative areas outside the parks and only require short-term assistance.

Transitional assistance will be delivered in two ways, based upon the ability of sectors to adjust:

- *Ex gratia* payments will be paid to those fishers in the rock lobster and finfish fisheries who, as result of redirection of fishing effort from marine national parks and sanctuaries, are able to demonstrate a loss of income directly related to reduced catch. This assistance will take place over a transitionary period as new fishing areas are investigated.
- To assist the abalone industry to identify and survey areas of currently under-utilised resource to replace current fishing grounds within the proposed Marine National Parks and Sanctuaries, scientific and technical support will be provided. This will require a detailed and systematic (reef by reef) approach working closely with individual fishers.

Enhanced enforcement

Enforcement is required to protect the integrity of the marine national parks and sanctuaries. Furthermore, experience has shown that the most effective way of combating large scale illegal fishing activity is through an appropriate balance between high visibility, on-water presence and well planned, joint agency enforcement operations, and targeting major players in the illegal trade.

The Government is substantially increasing the Department of Natural Resources and Environment's (NRE's) fisheries compliance budget by $3 million per annum. This will result in:

- 21 new regional, field based fisheries officers;
- 3 strategically located Regional Investigations Officers to plan coordinated major, intelligence based, joint agency enforcement operations;
- Expansion of the Special Investigations Group (SIG) to include additional intelligence analysis and investigators to concentrate on the abalone fishery;
- Provide a permanent fisheries presence between Geelong and Warrnambool; and
- Purchase a new fisheries patrol vessel to provide additional at-sea compliance capacity on the Gippsland coast.

Part of the enhanced compliance effort will be specifically applied to the abalone fishery in order to significantly reduce the level of abalone theft impacting on the commercial fishery. These measures will ensure enhanced compliance along the whole coast.

A phase-out of fishing in marine national parks and sanctuaries

The Government is establishing 22 marine national parks and sanctuaries on 16 November 2001. To assist commercial and recreational fishers to adjust to the new marine parks system, provisions to prohibit fishing will come into effect in two phases. Fishing will be prohibited from 16 November 2001 in 9 marine national parks and 9 marine sanctuaries. Commercial and recreational fishing will be prohibited from the remaining three marine national parks (Discovery Bay, Twelve Apostles and Corner Inlet) and Point Cooke Marine Sanctuary from 1 July 2003.

Adjustments to ECC recommendations to reduce fisheries impacts

Following wide consultation with stakeholder groups the Government has agreed to a number of changes to the ECC's recommendations, which will limit the impacts on commercial and recreational fishers as follows. The recommended Cape Howe

Marine National Park will not be established, and the Twelve Apostles Marine National Park has been reduced in size to exclude the area east of Moonlight Head. To reduce the impacts on recreational fishing, the Ricketts Point Marine Sanctuary will not be established and some minor changes have been made to the boundaries of Discovery Bay and Twelve Apostles Marine National Park to allow recreational beach fishing at popular sites.

Performance assessment and monitoring

Commercial and recreational fishers, conservation groups and the broader community have repeatedly raised the lack of monitoring and research data as an impediment to illustrating and communicating the effective management of existing marine parks and the validity of establishing 'no-take' areas. The Government is committed to ensuring a credible performance assessment and monitoring program that will:

- Provide information for the continuous improvement of the management of the marine parks system as a public asset;
- Assess the effectiveness of these areas in protecting the biodiversity of marine resources;
- Ensure maximum value is received from use of public resources; and
- Transparently demonstrate the role that marine parks systems play in the protection and management of the marine environment.

Compensation

The establishment of marine national parks and sanctuaries is about the protection of an important community asset, the marine environment. Given the package of assistance measures outlined above, which the Government considers will address potential impacts, and the enduring public good outcomes that will be achieved, the Government considers that it is unreasonable for the State to be exposed to the possibility of paying additional funds by way of compensation. Consequently, the legislation to establish the marine national parks and sanctuaries will provide that compensation will not be payable.

* The government response is available in full at www.nre.vic.gov.au

APPENDIX 9

Criteria and indicators to assess the effectiveness of no-take fisheries reserves (from Ward *et al*. 2001)

Not all these criteria and indicators will apply in all reserves or in all circumstances. This is a comprehensive set from which the relevant and appropriate Criteria and Indicators can be chosen to suit a specific set of circumstances.

Selection Process
(establishes boundaries, sizes, location, network interactions, from a set of previously identified candidate areas)

1. Putative objectives developed?
2. Selection models – area selection outcomes; scientifically robust?
3. Precautionary approaches applied?
4. Interactions with other uses/objectives integrated?
5. Security of tenure (time and/or space)
6. Adequate resources provided for planning activities?

Declaration Process
(underpins broad sustainability of the reserve's existence)

7. Participatory, to create local and stakeholder ownership of the outcomes?
8. Explicit and accountable?

Management Planning
(underpins the continued performance of the reserve)

9. Management strategies, plans and actions in place?
10. Operational goals and objectives in place?
11. Participatory development of the management regime and activities?
12. Enforcement of regulations, monitoring of compliance
13. Appropriate penalties and disincentives agreed and implemented?
14. Capacity to change strategies, plans and actions in the light of new information/data?
15. Adequate resources provided for management activities?
16. Active program of benchmarking management plans and actions?
17. Active program of stakeholder education about the values of the reserve?

Performance Assessment Process

18. Routine monitoring and evaluation used to assess achievements of goals and objectives?
19. Processes underpinning reserve performance actively studied?
20. Threatening processes known or being evaluated?
21. Part of an integrated system or network of reserves?
22. Functions as effective harvest refuge?

Biological Outcomes

(after Roberts & Polunin, 1991; Dugan & Davis, 1993; Guenette *et al*., 1998)

Local Benefits (within the reserve)

Populations of Focal Species

23. Enhanced abundance and/or density?
24. Enhanced mean age and/or size?
25. Natural sex ratio maintained?
26. Natural age-size-sex population structure maintained?
27. Reproductive output (eggs / larvae) enhanced?
28. Spawning stock protected?

Community / Biodiversity

29. Areas of undisturbed habitat established / maintained?
30. Habitat complexity enhanced?
31. Species diversity enhanced?
32. Community complexity (eg. trophic complexity) enhanced?
33. Important local ecosystem processes maintained?

Regional Benefits (outside the reserve)

Population of Focal Species (for the stock as a whole)

34. Fishery yields enhanced?
35. Abundance and/or density enhanced?
36. Reserve provides recruitment source through export of eggs and/or larvae?
37. Reserve provides source of post-larval stages through emigration?
38. Abundance maintained?
39. Age-size-sex structure improved?
40. Reserve provides insurance against management failures (ie. stock collapse)?

41. Intra-specific genetic diversity protected?

Community / Biodiversity

42. Habitat complexity, species diversity and/or community complexity enhanced?
43. Important regional ecosystem processes maintained?

Populations of other Targeted Species

44. Fishery yields maintained?

Management Outcomes

45. Enforcement simplified?
46. Ease of public understanding and acceptance of management?
47. Provides sites and facilitates multi-disciplinary scientific study of natural ecosystem structure, function and dynamics?
48. Defends against non-sustainable development options for the reserve site, by excluding incompatible activities?
49. Contributes to integrated ecosystem-based management of marine ecosystems?
50. Data-collection requirements reduced?
51. Contributes to improved estimates of focal species population parameters (such as natural mortality, population structure)
52. Provides sites and facilitates education and training opportunities?

Economic Outcomes

<u>Local and Regional Effects</u>

53. Local economies augmented?
54. Economic opportunities enhanced and diversified?
55. Opportunities for employment in local industries enhanced?
56. Opportunities for low-impact traditional or subsistence fishing or gathering of natural marine resources enhanced?

Social Outcomes

57. Quality of life of the majority of stakeholders, particularly the local communities, improved?
58. Social and cultural well-being of local communities maintained?

APPENDIX 10

AUSTRALIAN SEAFOOD INDUSTRY COUNCIL POLICY STATEMENT ON THE IMPLEMENTATION OF MPAs AND RESPONSE FROM THE ANZECC TASK FORCE ON MPAs

ASIC Policy (1998)	ANZECC TFMPA Response
MULTIPLE-USE REGIONAL PLANNING MANAGEMENT *Recommendation 1: The fishing industry planning and management mechanisms for the marine environment must be regional scale, catchment based and multiple-use.* Australia's $2 billion fishing industry relies on maintaining access to a healthy and productive marine environment. Planning mechanisms for the marine environment should be catchment based to effectively address land use impacts. It is also critical that the concept of multiple-use be embedded throughout all relevant planning exercises. This concept need not exclude 'no take zones', but they should allow for uncertainties and new knowledge to be addressed within a planning framework. The fishing industry has a well established track record on supporting the protection of fish habitats such as wetlands. Such areas need more than representative areas set aside and the fishing industry is an important and supportive constituency for such action.	TFMPA agrees to the recommendation that oceans planning and management mechanisms should be regional scale and catchment based, while recognising and managing for multiple-uses. The meaning of ASIC's comment that "This concept (of multiple-use) need not exclude 'no take zones', but they should allow for uncertainties and new knowledge to be addressed within a planning framework" is not clear. The *Guidelines for Establishing the National Representative System of Marine Protected Areas* (*NRSMPA*) (the *Guidelines*) specifies that MPAs in the NRSMPA should have a secure tenure (ie can only be revoked by a Parliamentary process) but this does allow for some flexibility within the MPA. As suggested in the ASIC policy statement, an MPA allows flexibility for those uses that are controlled by management planning and/or zoning. TFMPA agrees that "fish habitats such as wetlands … need more than representative areas set aside". This recognises the significant role wetlands play in maintaining wider ecological processes, as well as providing habitats and nursery areas for many marine (including commercially and recreationally important) species. In addition, the replication of ecosystems, within MPAs and across their geographic and environmental domains, is strongly supported for several reasons. For example, replication provides insurance in the case of a catastrophic event (natural or man-induced) which could devastate an ecosystem. Although one location of the ecosystem may be 'lost', another will still be protected elsewhere. TFMPA considers that all ecosystems deserve this type/level of protection, not just "fish habitats

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	such as wetlands". The size of the MPA is critical in determining its adequacy (ie the ability of the MPA to sustain ecological process and ecosystem function) and to provide for the natural patterns of variation, recognising the scale and nature of the marine environment. Depending on the values to be protected large MPAs may be more appropriate than smaller MPAs, but together they would form a network of MPAs that is the basis of the NRSMPA. **Notes** 1. Action 28 of the draft *Strategic Plan of Action for the National Representative System of Marine Protected Areas* (*Plan of Action*) relates to best practice management planning, and involves examination of national and international models for protected area management, including multiple-use management principles. Recommendations on management actions to best meet objectives of protected areas are one likely outcome. 2. The *Guidelines* specify one of the secondary goals of the NRSMPA is: "*To provide a formal management framework for a broad spectrum of human activities, including recreation, tourism, shipping and the use or extraction of resources, the impacts of which are compatible with the primary goal*."
ASSESSING EFFECTIVENESS OF EXISTING MPAs *Recommendation 2: An assessment of the effectiveness of existing MPAs in Australia should be undertaken urgently and the outcomes of this project be used to revise (if necessary) the national strategy for MPAs and other relevant strategies*. While significant resources have been dedicated to implementing MPAs, considerably less appear to have been directed towards assessing their effectiveness.	TFMPA agrees that performance assessment of existing MPAs is required as a priority and this is clearly identified in the draft *Plan of Action*. However, it is not expected that the outcomes of such assessment would require revision of the national strategy within its three year life. Key actions of the draft *Plan of Action* relate to the development of performance assessment systems for individual MPAs and for the NRSMPA as a whole (refer Actions 29, 30 and 31), in the context of the sustainable management of adjacent waters. Although the draft *Plan of Action* proposes that the first performance assessment

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The fishing industry remains uncertain about the net benefits or otherwise of MPAs. A full and rigorous assessment of the effectiveness of MPAs in achieving their objectives is essential. A logical first step before further progressing further MPAs would be to review the effectiveness of existing MPAs. In the absence of this assessment it is likely that the fishing industry will remain concerned and sceptical about MPAs and continue to strongly oppose their implementation.	of the whole System will not be completed until the end of 2000, Australia's State, Northern Territory and Commonwealth jurisdictions are already developing performance indicators to input to the national reporting process. It is recognised that a rigorous and scientific assessment of the effectiveness of MPAs needs to address the many objectives of MPAs and must be ongoing. TFMPA does not agree that the lack of performance assessment of MPAs should delay progress on future MPAs. In fact, in the *Guidelines*, ANZECC has adopted the precautionary principle in the development of the NRSMPA to deal with the lack of scientific certainty and potentially high degree of risk of negative impacts from human activities in the marine environment. One of the implications of this is that the absence of scientific certainty should not be a reason for postponing measures to establish MPAs to protect representative ecosystems. It should be noted that the precautionary principle is in the enabling legislation of the Australian Fisheries Management Authority. Ongoing monitoring will help to model the effects of an MPA, but the question as to whether an MPA is ultimately 'effective' will only be conclusively answered in the long term. **Notes** 1. Action 11 of the draft *Plan of Action* aims to improve the relationships between the jurisdictions and industries (including fishing) and other stakeholders, and encourage the sharing of information that is required to assess the effectiveness of MPAs. 2. Assessing the effectiveness of MPAs should not be considered in isolation. As a corollary of what ASIC expects in relation to assessing the effectiveness of existing MPAs, the effectiveness of current fisheries management in conserving biodiversity should be fully and rigorously assessed because of similar concerns regarding their effectiveness by other stakeholders.

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OBJECTIVES OF MPAs *Recommendation 3: Defining clear agreed objectives must be the first step in developing MPAs. These objectives must be used as a key determinant in considering selection, evaluation and implementation of suitable areas for MPAs.*	TFMPA agrees that "lack of clarity in the objectives of declared MPAs" would prevent accurate performance assessment. The *Guidelines* specifically lists a responsibility of jurisdictions in relation to establishment of MPAs (section 2.1) to: "identify management objectives and intentions" for each MPA. Ideally this would take place in prior consultation with stakeholders.
The objectives of MPAs must be clearly and unequivocally defined before their declaration. This step has been frequently omitted or quickly passed over (Potter, 1994). McNeill (1994) identifies that a lack of clarity in the objectives of declared MPAs in Australia has hampered any assessment of their success. The fishing industry has seen several examples where stated objectives have been unclear, or worse, frequently changing. Several of the objectives for protected areas in the Cape York Marine Park were insufficiently detailed. Correspondence and discussions with agencies involved in establishing protected areas in the Cape York and Moreton Bay Marine Parks revealed that the agencies involved were unclear themselves as to the objectives of these protected areas. The objectives continued to evolve after areas had been identified as no fishing areas. Such actions create cynicism rather than instil confidence in the planning and implementation process for MPAs.	The *Guidelines* also states that key characteristics define the MPAs that form the NRSMPA, as compared to other marine managed areas. One of these characteristics is: "that the MPA has been established especially for the conservation of biological diversity". Consistent with this primary objective, there will be other objectives of the MPA that will be developed and agreed as the proposal is developed. Secondary objectives may be provided for by management planning and/or by the use of specific zones.
ECONOMIC & SOCIAL IMPACTS *Recommendation 4: Assessment of the potential economic and social impacts (including flow on effects) of modifying the fishing industry's access to fisheries resources must be undertaken and considered during the planning process of MPAs.* ESD requires consideration of economic and social, as well as ecological factors. However, consideration and implementation of MPAs to date have been done with scant analysis, or even recognition, of the social or	TFMPA agrees with the recommendation that potential social and economic impacts should be considered when fishing access is restricted by an MPA. Historically, the majority of MPAs considered for implementation nationally have recognised the social and economic impacts of fishers. The *Guidelines* explicitly list both economic and social interests as key criteria to be used in the selection process for MPAs and state as a responsibility of jurisdictions in relation to establishment of MPAs: "assess relative ecological and socio-economic values".

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economic impacts of the establishment of MPAs. MPA agencies seem to be failing to learn the lessons of the forestry debate which resulted in a level of conflict unprecedented in this country before serious action was commenced to integrate data on the social and economic impact of reserve systems into the decision making process. It is important to note that a key determinant in resolving the conflict generated by the implementation of Dugong Protected Areas (DPAs) in the Great Barrier Reef region, was the provision of rigorous independent data on the impact the proposed DPAs would have on seafood production and jobs, particularly in regional areas. That data enabled an agreed outcome whereby a high level of protection was afforded to dugong with minimal impact on jobs and fishing families.	In this assessment process, fishing industry data can be invaluable. In the past, fisheries managers have not always made data on level and location of fishing effort readily available to those responsible for developing MPA proposals. The success of the process for including consideration of fishing effort for the Great Barrier Reef's Dugong Protected Areas, demonstrates the value of making this information available at an early stage in the assessment process. Action 11 of the draft *Plan of Action* relates to a proposal to encourage the sharing of information that is required to assess MPAs; the information is essential for assessing proposals initially as well as for assessing MPA performance after establishment. With respect to the NRSMPA, it is the responsibility of the jurisdictions to "consult with stakeholders, including consideration of industry, displacement and compensation issues" in relation to the establishment of MPAs (the *Guidelines*, section 2.1).
ASSESSMENT AND METHODOLOGY CRITERIA *Recommendation 5: Rigorous performance assessment methodology and criteria must be developed for all MPAs (before implementation for new MPAs) and resources to ensure these assessments are adequately undertaken must be allocated as a matter of urgency.* Studies of the impact of MPAs on biomass or biodiversity have often had to rely on comparing fished and unfished areas, thus leaving natural spatial variability as a confounding factor (eg. Ferreira and Russ, 1995). This is not a result of poor research by scientists, but rather a reflection of poor planning of MPAs and a lack of commitment and timely provision of research support by agencies. The success or otherwise of many protected areas has not been assessed. The fishing industry believes that experimental designs such as "BACI" or "Beyond BACI" (Underwood, 1992) or other appropriate and rigorous experimental designs must be used to assess the	TFMPA strongly agrees that sufficient resources need to be made available to ensure that adequate assessments are undertaken at spatial scales relevant to the declaration of MPAs. TFMPA also agrees that the BACI methodology for measuring environmental impacts (involving assessments BEFORE and AFTER an event, in CONTROL sites and IMPACT sites) is a useful approach, where time and resources are available for its proper implementation, to determine how an impact has effected some pre-chosen environmental variable. In most cases however, this technique does not lend itself well to practical application in MPAs. The multitude of environmental variables and complex interactions which are often present in an area the size of an MPA make it difficult to choose key variables up front in a meaningful way. Additionally, the long-term nature of an MPA makes these particular 'natural experiments' non-compliant with the rigorous BACI design which requires a similar amount of monitoring before and after the impact. Additionally, implementation of an MPA does not normally provide for adequate replication required in rigorous

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effectiveness of MPAs. Such experimental designs typically need provision of resources for research before implementation of the MPA.	experimental monitoring, making natural spatial variation also difficult to measure. The comprehensive implementation of a 'best practice' approach to design and implementation of MPAs will include agreed decisions on objectives, performance criteria and indicators. Once these are agreed amongst stakeholders, good design processes can be used to determine boundaries, zonings, and performance against the established objectives for the MPA. **Notes** 1. Refer also to response to **Recommendation 2** in **Section 2 Assessing Effectiveness of Existing MPAs** relating to performance assessment. 2. While TFMPA agrees that rigorous performance assessment methodology and criteria must be developed for MPAs, TFMPA considers that a similar approach to performance assessment should be taken for resource extraction activities. This approach is not consistently being carried out for marine resource uses and attempts to do so will face the same difficulties as MPA assessment. Such assessments, based on habitats and communities rather than individual commercial species, should be standard for fisheries management.
MPAs MUST MEET AGREED OBJECTIVES *Recommendation 6: The fishing industry believes that MPAs which are assessed as not meeting their objectives must be removed or modified to enable fishing activities which do not impede the MPA meeting its objectives.* Regulations impacting on the fishing industry, and in particular closures, have typically been a "one way gate". In the past once an area is closed to fishing, political pressure, regardless of the	One of the key characteristics that define the MPAs that form the NRSMPA, is that they "must have secure status which can only be revoked by a Parliamentary process". The capacity to manage and assess the effectiveness of MPAs will vary depending on a number of factors including access to resources and remoteness. TFMPA would not agree with the recommendation that an MPA 'must be removed or modified'. However, through management planning processes, jurisdictions may modify MPA management to vary allowable activities. This would also depend on establishing with certainty that

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effectiveness of the closure has prevented it reopening. This was highlighted by the opposition to the opening of several "green" reefs in the Great Barrier Reef as part of the Reef CRC's Effects of Line Fishing Project (Mapstone and Davies, 1997). Commitment to the removal of the "one way gate" philosophy is essential to ensure that a network of MPAs meet their objectives in the long term, while maintaining at least some level of access to resources by the fishing industry.	the proposed activities will not compromise the MPA objectives. Commitment to the removal of the "one way gate" philosophy is not essential to ensure that a network of MPAs meets its objectives in the long term; it would be preferable for the management of an MPA to be reviewed to ensure compatibility where possible. The secure status of MPAs is important for security and certainty for all stakeholders, including the fishing industry.
CONSULTATION WITH FISHING INDUSTRY & FISHERIES AGENCIES *Recommendation 7: The fishing industry and fisheries agencies must be fully integrated into the decision making process regarding assessment, selection and implementation of MPAs. Any MPA which may impact on fisheries must be considered through the relevant management process and enacted under fisheries legislation.* *The planning approach must ensure consultation with stakeholders prior to an area being defined and then consulted on the proposed zoning plan.* *The fishing industry believes a legislative basis for the consultation and ongoing management processes in required.* Fisheries agencies through the management process are best placed to determine MPAs from the aspects of fisheries ecology and biodiversity, determine the fisheries undertaken in a specific area, the socio-economic impact of its cessation and the potential of the fishery to impact on the objectives of the MPA. Conflict with the establishment of protected areas in Moreton Bay could have been reduced or eliminated if the State Department of Environment had consulted with relevant fisheries agencies.	TFMPA agrees that the fishing industry and fisheries agencies must be included in MPA processes. Under statutory processes Governments are responsible for the declaration of MPAs. Governments may choose to include stakeholders at any stage of their process/es; however, stakeholders should be involved at the stages where options for location of an MPA are being considered and when consideration is made of suitable activities to be allowed within the MPA. The latter may occur when the MPA is declared and then in more detail later during the management planning process. Stakeholders could also be involved in objective setting, monitoring and reporting. Assuming that consideration of an MPA "through the relevant management process" is a reference to the relevant fishery's Management Advisory Committee, this is currently the case for MPAs in Commonwealth waters. A requirement that the MPA be "enacted under fisheries legislation", is not appropriate for the Commonwealth waters. The legislation under which MPAs are declared in Commonwealth waters, the *National Parks and Wildlife Conservation Act 1975*, overrides fisheries legislation where the two are in disagreement. Otherwise the two sets of legislation may operate jointly.

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The fisheries management process is a comprehensive, collaborative and inclusive process. It provides the broad stakeholder representation necessary to ensure all issues are discussed from all perspective's and that final decisions have the appropriate community ownership necessary for their long term adoption and success. There is a general paucity of information about the marine environment and fishers are an important source of information useful for planning purposes. Accessing such information prior to formal zoning proposals are shaped can help identify valuable areas (both ecologically and economically) and prevent conflict. Both consultation and the existence and composition of management committees need to be both guaranteed in law and need to involve commercial fishers. Such involvement has been emphasised on many occasions by experts in the field of marine park planning (Kelleher & Kenchington, 1991).	The situation in Australia's jurisdictions is varied. In some jurisdictions (eg. Tas, NT) MPAs are likely to be declared under both "environmental/conservation" and fisheries legislation. TFMPA endorses the involvement in "management committees" of fishing industry representatives, management or operators. Institutionalising involvement of stakeholders in the MPA process is generally supported. Legislating for this may represent one mechanism to achieve this. However, TFMPA supports a more informal suite of mechanisms that achieve binding arrangements. **Notes** 1. Refer also to response to ***Recommendation 4*** in ***Section 4 Economic and Social Impacts*** relating to availability of data on level and location of fishing effort. 2. TFMPA recognises that effective monitoring and management of many MPAs could be enhanced by capitalising on the experience and expertise of the fishing industry. Some jurisdictions are pursuing this model.
CRITERIA FOR CLOSED AREAS *Recommendation 8: The industry believes that decisions to close areas should be taken for ecological reasons and not for stock reallocation reasons*. The industry notes the well documented size of recreational catches of fish. In many inshore areas the closure of commercial fishing without an associated closure of recreational fishing merely reallocates fish resources, not protects them. Closure decisions should be taken on ecological grounds and take into account all environmental impacts in the area of interest.	TFMPA agrees "that decisions to close areas should be taken for ecological reasons and not for stock reallocation reasons" and that "Closure decisions should be taken on ecological grounds and take into account all environment impacts in the area of interest". Ecological reasons and ecological grounds should include the impacts of human activities on the ecology and environment. One of the key characteristics defining the MPAs forming the NRSMPA is "that the MPA has been established especially for the conservation of biological diversity". TFMPA does recognise, however, that area closures not involving MPAs may be introduced by jurisdictions for reasons other than biological diversity.

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STRUCTURAL ADJUSTMENT *Recommendation 9: Structural adjustment assistance must be offered to the fishing industry for loss of access because of the establishment of MPA.* Structural adjustment assistance is necessary to ensure that effort is not transferred out of a newly declared marine protected area to another area. Structural adjustment must include purchase of sufficient licences to offset any fishing effort displaced by the MPA, compensate fishers for loss of income caused by the establishment of the MPA, purchase any seafood industry businesses which become non-viable because of the establishment of the MPA.	The matter of structural adjustment assistance is the responsibility of each jurisdiction, as specified in section 2.1 of the Guidelines. In Australia's Oceans Policy the Commonwealth Government has made a commitment to: • "continue to pursue self-funded adjustment strategies implemented through a range of economic incentives for those fisheries identified as needing adjustment; • develop and implement measures to remove excess capacity in other fisheries which are over-capitalised in order that fishing effort is in accordance with ecologically sustainable levels".

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