

Marine Coastal & Estuarine Investigation

**Draft Report
for Public Comment**

**E
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**Environment
Conservation
Council**

What is the ECC?

The Environment Conservation Council (ECC) was formed in mid 1997 replacing the Land Conservation Council. The ECC advises the Victorian Government on the use of public land; it makes recommendations, not decisions. It investigates issues at the request of the relevant Minister and, in doing so, takes into account resource use and social issues as well as environmental needs. The ECC's aim is to balance the competing needs of the environment and public land (and water) users, in order to achieve ecologically sustainable and economically viable public land use.

The ECC members are Professor John Lovering AO (Chairman), Mrs Eda Ritchie and Ms Jane Cutler who are supported by a team of professional staff.

Professor Lovering was until recently President of the Murray Darling Basin Commission. He has held senior academic positions, chaired company boards, and served on national and international scientific and government committees.

Mrs Ritchie is a farmer from near Hamilton in Western Victoria. She is also Chairman of the Western Regional Coastal Board, Chairman of the Committee of Management for Rural Ambulance Victoria, a member of the Rural Finance Board, a trustee of the Ross Trust, and a Board Member of the Howard Florey Institute for Medical Research.

Ms Cutler has a Masters Degree in Environmental Science, holds a senior position in the finance sector and has many years of experience managing environmental issues for the resources industry. She has served on a number of boards and trusts including as a Director of Landcare Australia.

The Council works with a wide range of groups including local government, Commonwealth and State agencies, business and industry, environment and conservation groups, Aboriginal people, recreation and tourism bodies, and interested individuals. The ECC is independent of other government agencies and develops its recommendations through data collection, the commissioning of expert research, and extensive consultation. Public input into investigations is encouraged and welcomed.

At the end of each investigation the ECC makes recommendations to the Minister. The State Government then considers these recommendations and makes decisions.

About this report

This report contains the Environment Conservation Council's draft recommendations for the management of Victoria's marine, coastal and estuarine areas. Following further community input, these recommendations will form the basis of the final report to Government due in mid 2000. It will mark the culmination of a process begun in 1991 by the then Land Conservation Council.

In developing the draft recommendations, the Council has visited all the recommended areas and sought input from a wide range of stakeholders, interested groups and individuals to better understand the broad strategic issues as well as the fine detail of marine management. An Advisory Group appointed by Council provided input and advice on technical issues associated with developing its recommendations. More than 2000 written submissions received throughout the process have been considered in detail. A large number of special reports were commissioned by both the Land Conservation Council and the Environment Conservation Council. Reports commissioned or prepared by other agencies, other States and the Commonwealth have been considered as well.

Council has consistently sought to embrace and integrate the policies and strategies of various levels of government and other agencies as they relate to the marine environment.

Public comment

The Environment Conservation Council is seeking public comment on the draft recommendations contained in this report. Closing date for submissions is 25 February 2000.

Please direct written submissions and requests for further information to:

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Environment Conservation Council

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Environment Conservation Council.

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Council's Message

Victoria's coast and our marine, coastal and estuarine waters are among our most precious and valued assets. As a community we must ensure that we hand them on to future generations in the best possible condition and as a productive asset. The fact that this marine, coastal and estuarine investigation has taken more than eight years to complete testifies to the difficulty of balancing the often competing needs of the community for, on the one hand, environmental protection, and on the other, access to marine resources and the economic and social benefits that flow from such access.

The Victorian Government recognises the need to maintain healthy and productive marine and coastal environments and has asked the Environment Conservation Council to make recommendations that will balance:

- the need to protect natural values by creating marine parks and conservation areas,
- the need to allocate areas for marine aquaculture industries, and
- the need for marine and coastal waters to be available for a range of uses such as commercial and recreational fishing, shipping, and other recreational and tourism activities.

The report proposes areas in the marine environment that should be reserved for the special protection of environmental values, and areas that should be set aside for aquaculture. The recommendations are part of a broader vision for the strategic management of the marine, coastal and estuarine environment in the years ahead. They should be seen in the context of ecologically sustainable management of the whole marine environment.

It is clear that the recommendations will have some impact on commercial and recreational fishers. Through extensive consultation every effort has been made to minimise these impacts while achieving the objectives of the investigation. In making recommendations for areas that are suitable to be developed for marine aquaculture, the Council has sought to address the real difficulties industry has had in gaining access to marine waters, as well as the concerns of the community about the potential environmental impacts of aquaculture activities.

Although much of the scientific information we take for granted for land management is lacking for marine areas, the recommendations in this draft report are solidly based on the best available scientific data. The Council is confident that the recommendations provide for a fair, realistic and sustainable vision for the management of Victoria's marine and coastal environment and natural resources into the future.

Contents

Council's Message	iii
Executive Summary	ix

Part One The Investigation

1. The investigation so far	3
2. Consultation program	8
3. Economic and social assessments	10
4. Other information sources	12

Part Two Addressing the Terms of Reference

5. Integrated management of Victoria's marine and coastal environment	17
5.1 National and State context	17
5.2 International listings of important conservation areas	19
5.3 Management objectives	21
5.4 Management recommendations	22
5.5 Coastal reserves	25
6. Marine protected areas	26
6.1 Protection of biodiversity	26
6.2 Recommended approach to marine conservation	27
6.3 A comprehensive, adequate and representative system of marine protected areas	28
6.4 ECC's response to major issues raised in relation to marine protected areas	29
6.5 Principles for the selection and management of marine protected areas	34
6.6 Identification and selection of candidate areas for marine national parks	35
6.7 The proposed system	37
7. Marine aquaculture areas	46
7.1 Victoria's aquaculture initiatives and ECC's role	46
7.2 Categories of marine aquaculture	47
7.3 Nutrient management and finfish culture in Port Phillip Bay	47
7.4 ECC's response to major issues related to marine aquaculture	48
7.4 Principles for selection and management of marine aquaculture areas	52
7.5 The proposed areas	52

Part Three Recommendations for Western Victoria - Marine Protected Areas

A1	Discovery Bay Marine National Park	58
A2	Twelve Apostles Marine National Park	60
A3	Point Addis Marine National Park	62
B1	Merri River Mouth Marine Sanctuary	64
B2	The Arches Marine Sanctuary	64
B3	Marengo Reefs Marine Sanctuary	66
B4	Eagle Rock Marine Sanctuary	66
B5	Point Danger Marine Sanctuary	68
B6	Barwon Bluff Marine Sanctuary	68
D1	Cape Bridgewater Marine Special Management Area	70
D2	Lawrence Rocks Marine Special Management Area	70
D3	Portland Bay Marine Special Management Area	71
D4	Lady Julia Percy Island (Deen Maar) Marine Special Management Area	71
D5	Logans Beach Marine Special Management Area	72
D6	Dinosaur Cove Marine Special Management Area	72

Part Four Recommendations for Bays and Inlets - Marine Protected Areas

Port Phillip Bay	75
------------------	----

A4	Point Cook Marine National Park	76
B7	Jawbone Marine Sanctuary	78
B8	Ricketts Point Marine Sanctuary	78
D7	Clifton Springs Marine Special Management Area	80
D8	Capel Sound Marine Special Management Area	80

Western Port	81
--------------	----

A5	Yaringa Marine National Park	82
A6	North Western Port Marine National Park	84
A7	Rhyll Inlet Marine National Park	86
D9	Honeysuckle Reef Marine Special Management Area	88
D10	Crawfish Rock Marine Special Management Area	88
D11	Observation Point (Rhyll) Marine Special Management Area	89
D12	San Remo Marine Special Management Area	89
D13	Bass River Delta Marine Special Management Area	90

Other Bays and Inlets	91
-----------------------	----

B10	Corner Inlet Marine Sanctuary	92
------------	-------------------------------	----

Part Five Recommendations for Eastern Victoria - Marine Protected Areas

A8	Bunurong Marine National Park	96
A9	Wilsons Promontory Marine National Park	98
A10	Ninety Mile Beach Marine National Park	100
A11	Point Hicks Marine National Park	102
A12	Cape Howe Marine National Park	104
B9	Mushroom Reef Marine Sanctuary	106
B11	Beware Reef Marine Sanctuary	106
D14	Seal Rocks Marine Special Management Area	108
D15	The Skerries Marine Special Management Area	108

Part Six Recommendations for Marine Aquaculture

E1	Grassy Point Aquaculture Zone	112
E2	Clifton Springs Aquaculture Zone	112
E3	Bates Point Aquaculture Zone	113
E4	Beaumaris Aquaculture Zone	113
E5	Mount Martha Aquaculture Zone	114
E6	Dromana Aquaculture Zone	114
E7	Flinder Aquaculture Zone	115
E8	Waratah Bay Aquaculture Zone	115
F1	Portland Aquaculture Investigation Area	116
F2	Pt Lillias Aquaculture Investigation Area	116
F3	Kirk Point-Werribee Aquaculture Investigation Area	117
F4	Corinella Aquaculture Investigation Area	117
F5	Bass River Aquaculture Investigation Area	118
F6	Anderson Inlet Aquaculture Investigation Area	118
F7	Corner Inlet Aquaculture Investigation Area	119

Notes and References	121
Appendix 1	
List of Organisations/Committees Consulted During the Process	125
Appendix 2	
Marine, Coastal and Estuarine Investigation Advisory Group Members	128
Appendix 3	
Victorian Coastal Strategy	129
Appendix 4	
Interim Marine and Coastal Regionalisation for Australia	131
Appendix 5	
Criteria for Marine Aquaculture Sites	135
Appendix 6	
Estimates of Commercial Fisheries Values in Recommended Marine National Parks	137

Executive Summary

The Victorian marine and coastal environment is unique in its natural diversity – nowhere else in Australia is there such a rich diversity of flora and fauna, and cultural sites and landscapes, along such a compact and easily accessible coast. Spectacular coastal landscapes and marine animals such as the Little Penguin, Southern Right Whale and Australian Fur Seal are major attractions.

In addition to its environmental values, the marine and coastal environment is a valuable economic resource. Victoria's commercial fish and shellfish industries generate jobs, exports and income. Recreational fishing is an important leisure activity for many people and provides significant economic benefits to coastal towns. Coastal and marine waters are used for shipping and the major ports are vital for trade.

Public land and waters, and the natural resources which are part of both, are precious and limited. Legitimate but competing uses mean that decisions on the allocation and management of those resources are controversial. Public land and waters have a range of values and are available for a wide range of uses including resource harvesting and extraction, aquaculture, transport, industry, recreation, tourism, education and research. Balancing these often competing interests and uses is difficult. There are no easy answers.

The investigation

The Environment Conservation Council (ECC), at the request of the Victorian Government, is carrying out an investigation of the State's marine, coastal and estuarine areas. The current investigation builds on earlier work conducted by the Land Conservation Council (LCC) and also takes into account work done by the Victorian Coastal Council and the development of Australia's Oceans Policy. Government programs

and reviews such as Victoria's Aquaculture Strategy and the major buy-back of bay and inlet fishing licenses have also been considered.

Terms of reference

The Government requested that the ECC make recommendations for the establishment of a representative system of marine parks and for areas suitable for marine aquaculture. The full terms of reference are included in Part One of this report.

Status of the ECC's Interim Report (1998)

In February 1998, the ECC released an Interim Report recommending the establishment of a Port Phillip Heads Marine Park and two aquaculture areas, one in and one adjoining Port Phillip Bay.

In December 1998 the then Minister requested that the Council review the recommendation for Port Phillip Heads Marine Park, having regard to the incompatibility of incorporating major shipping channels in a marine park. The Council will provide a separate report on Port Phillip Heads to the Minister in due course. The recommendations for the two aquaculture areas are currently under consideration by Government.

Consultation program

More than 2000 written submissions have been taken into account in the preparation of this report. This huge resource of information and informed comment has been enormously valuable in helping draft the recommendations. An Advisory Group was established for the investigation to provide input and advice regarding technical issues associated with developing recommendations.

In addition to consideration of written submissions, the ECC has sought input from a wide range of stakeholders through both public meetings and briefings and Council has visited all sites proposed in the draft recommendations.

Following the release of this draft report there will be a series of briefings and public meetings. Stakeholders are encouraged, and will be given every opportunity, to make submissions to the ECC on the recommendations in the draft report.

Addressing the terms of reference

As a society we have a responsibility to pass on an environment to future generations that will continue to give them the benefits that it has given us. We have learnt many lessons from past management and mismanagement of the terrestrial environment, and with our increased understanding of how natural systems operate there is no reason for our generation to repeat the mistakes of the past.

Maintaining the health and integrity of our marine ecosystems is fundamental to good management of Victorian coastal and marine waters. Care must be taken not to threaten the biological diversity and ecological processes on which continued use of the sea depends. Victoria's marine biodiversity is a significant part of Victoria's wealth. As the product of hundreds of millions of years of evolution, it is intrinsically valuable in itself and as a gene pool for the future. It is also of great commercial, recreational and cultural value to all Victorians.

The creation of marine parks alone will not protect all the important environmental and other values of our marine areas. Similarly, on land, good management of other areas such as state forests and private land complement our park system. There are many activities on land which have a detrimental impact on the marine environment, and therefore sustainable management of our whole environment involves managing both land and sea activities in an integrated manner.

The ECC is recommending objectives and guidelines for the integrated management of the whole marine and coastal environment. The objectives and guidelines are intended to ensure that resource use is sustainable and that significant environmental values are protected while social and economic benefits are optimised.

As part of this integrated approach, the ECC has recommended that some areas be reserved as marine protected areas and other areas for marine aquaculture. These recommendations are summarised below.

Marine protected areas

Recommendations

The ECC is recommending a system of **12 Marine National Parks** along the Victorian coastline. These parks, which will be highly protected, form the major component of the marine protected areas system.

The Marine National Parks will be complemented by **11 smaller Marine Sanctuaries**, which are also highly protected, and are designed to protect particular features.

Five **Marine Conservation Parks** are recommended taking in most of the current multiple-use marine parks where the current management arrangements will continue.

Areas are also identified where a lower level of protection is sufficient to protect special features, and it is recommended that these sites are protected in **15 Marine Special Management Areas**.

Out of a total Victorian marine area of 1 017 400 ha, the areas recommended in each category are: Marine National Parks 59 697 ha, Marine Sanctuaries 3 306 ha, Marine Special Management Areas 5 618 ha and Marine Conservation Parks 56 168 ha. More information on all proposed areas is given in Parts Three to Five of this report.

The case for highly protected areas

- There is increasing concern regarding degradation of the marine environment. Highly protected areas provide for protection of marine biodiversity and in particular genetic and ecosystem biodiversity. The long term consequences of apparently benign and sustainable fishing practices are unknown, but are likely to include altering the genetic make-up of the fish stock, by selectively removing (for example) larger individuals, and ecosystem effects by removal of biomass or species that have a critical ecological role. Highly protected areas provide for some areas to be retained in as natural a state as possible.
- National Parks on land have long been accepted by the general public as a key component in the overall good management of our environment. In Victoria approximately 15% of our land area is in highly protected National or State Parks or other conservation reserves. Victorians are rightly proud of their system of parks and reserves which form a major focus for recreation and tourism in the State.
- By contrast only 0.05% of Victoria's marine environment is in highly protected conservation reserves. The ECC's recommendations if adopted in full will increase this proportion to approximately 6.2%.
- Marine parks with high levels of protection will be invaluable as scientific reference areas and can be monitored in a scientifically rigorous manner.
- They provide protection for key sites such as breeding areas for fish and other marine animals and hence can act as stocking sites for many species. In this manner they act as a valuable insurance measure.
- The waters of southern Australia are unique in the world and contain many plants and animals that occur nowhere else on earth. They also contain spectacular underwater scenery such as magnificent towering kelp forests and highly colourful and fish filled reef areas that rival the better known tropical

waters. These attractions already support tourism ventures that have the potential for significant expansion.

- Highly protected areas have the same rules for both commercial and recreational users and the management arrangements are easily communicated.
- Balanced use involves having some areas where human impact is minimised so that these areas can be passed on to future generations in as natural a state as possible.

Coastal reserves

Coastal reserve zones provide protection for, and recognition of, the often narrow public foreshore area. This area is a focus of recreational use and public enjoyment, and supports an often fragile coastal ecosystem and landscape. Two zones are proposed: the Coastal Protection Zone has a focus on conservation and protection of natural values, and the Coastal Recreation Zone has a focus on recreational use and associated development.

The ECC, in conjunction with Victorian Coastal Council, has mapped in detail the coastal zoning for coastal public land outside parks and reserves as broadly delineated in the Victorian Coastal Strategy. The ECC recommends that the adjustments be incorporated into the Victorian Coastal Strategy.

Marine aquaculture

Recommendations

The ECC is recommending a system of **15 marine aquaculture areas**. These are comprised of **8 aquaculture zones** where there is sufficient information available to define specific areas with a reasonable degree of certainty that aquaculture will be successful, and **seven** generally larger **aquaculture investigation areas** where further work is required to define the exact areas suitable for aquaculture.

The zones total 1 707 ha and the investigation areas total 12 446 ha. More information on all proposed areas is in Part Six of this report.

Aquaculture proposals may be considered for areas outside the preferred aquaculture areas through mechanisms outlined in the *Victorian Aquaculture Strategy*.

The case for marine aquaculture areas

- Marine aquaculture has major potential for growth in Victoria and to contribute markedly to the overall economy and, in particular, to regional economies.
- Over the next few years it is expected that production of marine food products will lag behind demand (both nationally and internationally). Aquaculture developments have the potential to reduce the gap and to some extent take pressure off wild fish stocks.

- Aquaculture, at a relatively small scale, has been successfully carried out in Victorian waters for many years with little conflict with other marine users.
- Despite the generally good track record to date, increased access to marine waters has been difficult to obtain and this is perceived to be a major impediment to further development of marine aquaculture in Victoria. In some cases at least, this was due to areas being chosen where conflicts with other users (eg recreational boat users) were almost insurmountable.
- The ECC has attempted to resolve these problems by consulting with industry to ascertain sites with potential for aquaculture. Areas have then been recommended where negative effects on the environment are negligible or within acceptable limits, and the potential for conflict with other users is minimal.

The Investigation

1. The investigation so far

The Government has asked the Environment Conservation Council to carry out an investigation of Victoria's marine, coastal and estuarine areas. The investigation builds on earlier work by the Land Conservation Council.

The Land Conservation Council, which was established by the *Land Conservation Act 1970*, commenced an investigation of Victoria's marine, coastal and estuarine areas under terms of reference provided by the Victorian Government in September 1991.

In June 1997 the *Land Conservation Act 1970* was repealed and replaced by the *Environment Conservation Council Act 1997*. Under this Act the Land Conservation Council (LCC) ceased to exist and the Environment Conservation Council (ECC) was established to respond to specific references from the relevant Minister.

During the initial investigation, which began in late 1991, the LCC produced a number of important reports, in particular:

- Marine and Coastal Special Investigation Descriptive Report, June 1993
- Marine and Coastal Special Investigation Proposed Recommendations, April 1995
- Marine and Coastal Special Investigation Draft Final Recommendations, June 1996

Each of these reports was widely distributed for public comment. The LCC commissioned various studies and research projects which added considerably to our knowledge of the marine environment. The flowchart on pages 4 and 5 outlines the investigation process of the LCC and the ECC.

The LCC's Draft Final Recommendations (1996) included 21 recommendations for multiple-use marine parks and 22 recommendations for sanctuary (or fully protected) zones within the marine parks. Eight preferred marine aquaculture areas were recommended. The LCC was in the process of considering submissions received following publication of the Draft Final Recommendations when it was replaced by the ECC. The ECC has access to all of the past work of the LCC and has made extensive use of it in the current investigation. The investigation so far has received more than 2000 submissions.

The Minister for Conservation and Land Management provided terms of reference to the ECC in 1997 for the investigation of Victoria's marine, coastal and estuarine areas. In particular, the terms of reference (quoted in full on page 6) require the Council to make recommendations on two matters:

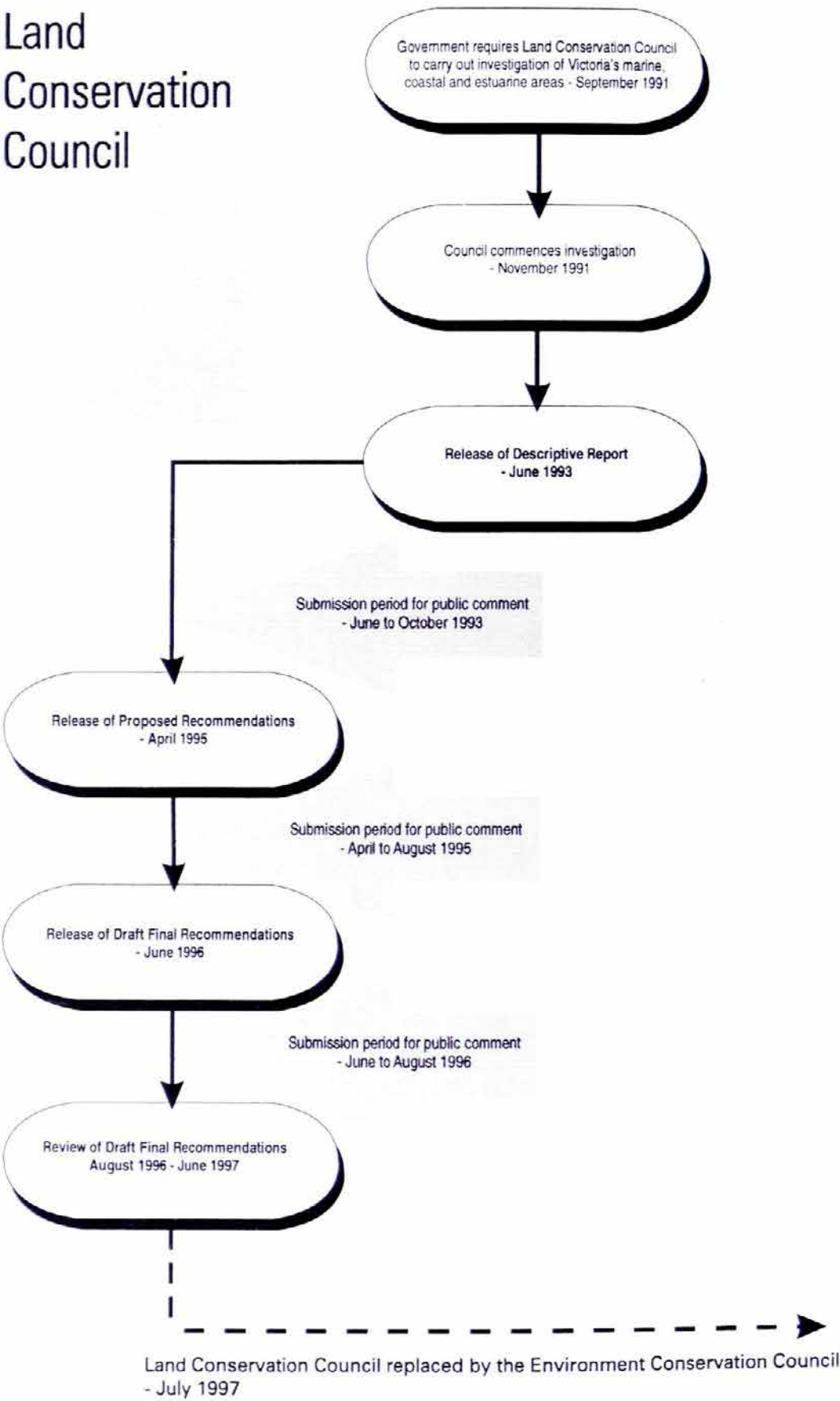
- a representative system of marine parks, and
- areas suitable for marine aquaculture.

This report addresses the need to protect significant environmental values while allowing for sustainable use of the area's resources. The recommendations build on the work of the LCC between 1991 and 1997, and take into account work done by the Victorian Coastal Council and the development of Australia's Oceans Policy.

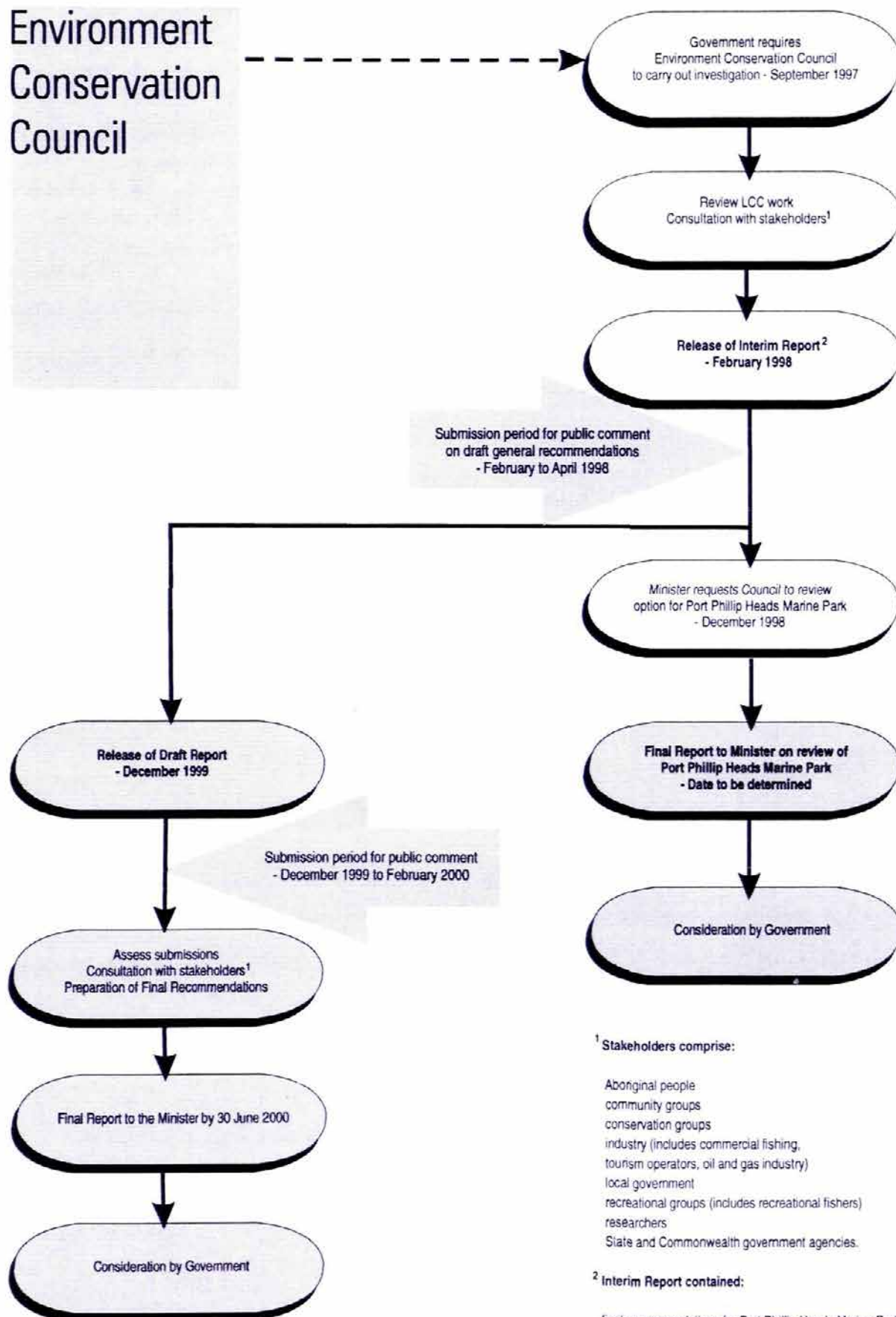
The final report must be given to the Minister by 30 June 2000.



Land Conservation Council



Environment Conservation Council



Terms of Reference for the Environment Conservation Council's Investigation of Victoria's Marine, Coastal and Estuarine Areas

The Minister, under Section 17 of the *Environment Conservation Council Act 1997* requires the Environment Conservation Council to complete a Marine and Coastal Special Investigation by 30 June 2000¹.

The investigation area extends from the Victorian offshore territorial limit (3 nautical miles) to a distance of approximately 1 km inland from the high-water, it includes the land (terrain, and overlying water) affected by marine, coastal and estuarine processes. Islands surrounded by marine and estuarine water are included in the investigation. On French Island the landward boundary of the area is approximately 1 km inland from the high-water mark. The bed and associated waters of the Gippsland Lakes are excluded. Land within cities and rural cities may be included at the discretion of the Council.

The Council is to investigate this area and make recommendations on the protection of significant environmental values and the sustainable use of these areas with priority given to:

- (a) a preferred approach and priorities for the progressive establishment of a representative system of marine parks in the State of Victoria; and
- (b) areas suitable for marine aquaculture, which can be developed on an environmentally sustainable basis.

In making these recommendations the Council is to have regard to:

- (a) the matters to be taken into account in investigations as provided in Section 20 of the *Environment Conservation Council Act 1997*;
- (b) the work undertaken by the Land Conservation Council and the Victorian Coastal Council; and
- (c) the Prime Minister's announcement on 3 March 1997 of the development of an Australian Oceans Policy.

The Council is to provide an interim report by 31 January 1998² recommending options for the early establishment of at least one marine park and at least one area suitable for the priority development of marine aquaculture.

¹ Originally 30 June 1998

² Originally 30 November 1997

What is the ECC required to consider in its investigations?

Under section 20 of the *Environment Conservation Council Act 1997*, the Council must have regard to:

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



Reports issued by the ECC

In February 1998 the ECC released an Interim Report, recommending the establishment of a Port Phillip Heads Marine Park and two aquaculture areas, one in and one adjoining Port Phillip Bay.

In December 1998 the then Minister, under section 17(3) of the Act, requested that the Council review the recommendation for Port Phillip Heads Marine Park, having regard to the incompatibility of incorporating major shipping channels in a marine park. The Council will provide a separate report on this matter to the Minister in due course. The recommendations for the two aquaculture areas contained in the Interim Report are currently under consideration.

As part of the Interim Report, the ECC also asked for public comment on:

- objectives and management guidelines for Victoria's marine, coastal and estuarine areas,
- principles for the selection and management of marine parks, and
- principles and criteria for selection and management of marine aquaculture areas.

The 236 submissions received in response to the invitation for public comment have been taken into account in framing these draft recommendations. Many comments were received in the form of letters to the Minister (or other members of the Government) and often related to the final recommendations for the Port Phillip Heads Marine Park. These have, for consistency, been treated as submissions and the comments have been taken into consideration in developing recommendations for the remainder of Victoria's marine area.

In May 1999 the Minister extended the time for the ECC to submit the report on the investigation to 30 June 2000, and directed the ECC to take into account the recently announced voluntary buy-back of commercial fishing licences, and further development of Commonwealth/State processes related to Australia's Oceans Policy.



2. Consultation program

During the preparation of the draft recommendations in this report, the ECC sought input from community and industry groups, government agencies and interested individuals on the proposals under consideration.

After further community input the draft recommendations in this report will form the basis of the final report to the Minister due in June 2000. The ECC has taken into account more than 2000 written submissions made to both the former LCC and the present Council. This huge resource of information and informed comment has been enormously valuable in helping the ECC draft its recommendations. Major issues raised during public consultation, and Council's response to these issues, can be found in sections 6.4 and 7.4 of this report.

In addition to inviting submissions, the ECC has been active in conducting public meetings and briefings. These have been undertaken for industry organisations, conservation groups, user groups, concerned individuals and government agencies. Between January 1999 and April 1999, advertised public meetings were held in nine locations along the coast. Councillors and staff conducted these meetings in regional Victoria to discuss the proposed content of the draft recommendations and to help resolve any outstanding issues. Over this period a number of local groups were convened by stakeholders to assist Council in formulating its recommendations.

An Advisory Group was established by Council for the investigation to provide input and advice regarding technical issues associated with developing its recommendations. The ECC Chairman convenes Advisory Group meetings.

The membership of the Advisory Group is listed in Appendix 2. The Advisory Group is an expertise-based group (as opposed to a representative group), whose members include individuals from State and Federal Government agencies, and people with backgrounds in the aquaculture industry, recreational fishing, commercial fishing, research, rural communities and conservation.

Organisations consulted during the process are listed in Appendix 1. A summary is provided below of recent consultation with key representative groups.

Commercial fishing industry

Seafood Industries Victoria (SIV) is the peak industry body, representing commercial fishing interests. Council has met several times with SIV and a number of affiliated fishing associations, and with individuals and groups of fishers over the past year.

Fisheries Co-Management Council

The Fisheries Co-Management Council was established under the *Fisheries Act* 1995 to promote co-management of fisheries and to advise the Minister on various matters related to fisheries management. The ECC has met a number of times with the Fisheries Co-Management Council and with several of its sub-committees related to commercial and recreational fishing.



Marine aquaculture industry

The ECC has sought advice on the technical feasibility of potential aquaculture areas from industry organisations such as the Victorian Aquaculture Council and the Gippsland Aquaculture Industry Network. Council has also met twice with the Aquaculture Sub-committee of the Fisheries Co-Management Council. A temporary aquaculture advisory group was also established by the ECC, with representatives from the aquaculture industry and the aquaculture section of Fisheries Victoria, to assist with developing recommendations.

Conservation groups

The ECC has met a number of times with the Victorian National Parks Association as the peak conservation organisation on marine issues. Council has also met with other groups such as the Australian Marine Conservation Society and the Surf Riders Foundation.

Community interests

The ECC has met in several locations with community groups such as progress associations, residents' groups, chambers of commerce and local business organisations. The input of tourism interests has also been sought at a State, regional and local level. In addition, temporary working groups were formed in some areas to liaise directly with the ECC. In south and east Gippsland, Members of Parliament and local Councillors facilitated groups representing commercial and recreational fishers and business (including tourism) interests. In far western Victoria a similar working group represented commercial fishers.

Charter boat operators

The ECC has met with the recently formed Victorian Charter Fishing Association to discuss issues related mainly to boat charters for recreational fishing, particularly in Port Phillip Bay.

Recreational fishing

The ECC has met several times with VRFish as the peak body established to represent recreational fishers. Council has also met with many individual recreational fishers and representatives of local groups at several regional meetings.

Department of Natural Resource and Environment (NRE) and other government agencies

The ECC has worked closely with a number of different NRE divisions in developing the draft recommendations in this report. In particular there has been considerable interaction with, and information provided by, Fisheries Victoria (including the Marine and Freshwater Resources Institute (MAFRI) and the Aquaculture Section), Parks, Flora and Fauna Division and Minerals and Petroleum Victoria. NRE regional staff have also been consulted widely particularly related to the detail of local fisheries and coastal management.

Other State government agencies consulted have included Parks Victoria, Victorian Channels Authority, Environment Protection Authority, Department of Infrastructure, Department of Premier and Cabinet, Museum of Victoria, Tourism Victoria and the Victorian Coastal Council (including the associated Western, Central and Gippsland Coastal Boards).

In addition, there has been consultation with many local government authorities and the Commonwealth agency, Environment Australia.



3. Economic and social assessments

As part of its task of making recommendations on the balanced use of public land and resources, the ECC must take into account economic and social values. The ECC must also balance local, regional, State and national interests as well as those of present and future generations.

There are a number of ways to carry out assessments of the social and economic impacts of the ECC's recommendations. A summary of methods of socio-economic assessment can be found in the LCC's Descriptive Report (1993).

Most methods have limitations of one kind or another. In particular, social and environmental impacts are very difficult to incorporate in most analyses, and there is an inevitable focus on readily identifiable impacts, which tend to be short-term financial losses or gains. For example, the distribution of costs and benefits of particular decisions among different groups within society is an important consideration, but is not easily assessed. Most cost-benefit analyses also struggle with 'pricing' environmental values although there is no doubt that, as a society, we place a high value on them. While socio-economic analyses are useful ways of structuring the assessment of resource issues, no technique can express, aggregate, weigh and compare the values of all the costs and benefits associated with alternative uses of land, water or resources. Although there is continual development of techniques to inform and assist policy-makers, there is no methodology that eliminates the need for governments to interpret community values and goals and make final judgements about resource use options.

Economic data available for the Victorian coast and marine areas comprises information on tourism, commercial and recreational fishing, and extraction of oil and minerals. Social data

includes information on population, occupations, incomes, and preferences for various activities, but data specific to the coast cannot readily be extracted from the general Victorian information.

The social and economic characteristics of the major population centres along the Victorian coast vary greatly. Outside Melbourne and Geelong, major activities associated with coastal population centres include agriculture, fisheries (including mariculture), tourism, recreation, industry, commerce, and petroleum production. Other important activities include the provision of support services, such as schools, medical and other community facilities.

Many coastal towns and settlements across Victoria have undergone significant change in recent years in response to changing social and economic conditions. The relative significance of different economic activities to local, regional and State economies varies enormously. Large coastal towns and cities, such as Warrnambool and Portland in western Victoria, have a broader economic base than smaller coastal towns such as Mallacoota and Marlo in east Gippsland. The socio-economic framework of many coastal towns and cities is complex with numerous links both within and beyond the coastal area.

Both the ECC and the LCC have commissioned social and economic assessments throughout this investigation. These are outlined in Section 4 on pages 12–14. The recommended marine national



parks account for the main commercial impacts, and an assessment of the value of fisheries resources in, and adjacent to, these recommended parks was recently undertaken by MAFRI²². The results of this work are summarised below and more detail is provided in Appendix 6 and in the park descriptions in Parts Three to Five of this report. Note that in some cases the data supplied by MAFRI has been adjusted to allow for changes to proposed boundaries since the initial assessment was done.

The value of commercial fisheries in the recommended marine national parks is approximately \$5.5 million for the State, being approximately \$4 million or 134 tonnes for the abalone fishery, about \$900 000 or 32 tonnes for the rock lobster fishery and \$600 000 for other fisheries. This is estimated to represent 9–10% of the Victorian abalone fishery, 6–7% of the Victorian rock lobster fishery, and about 5% of the scalefish fishery. The 'other fisheries' estimates include the value of commercial fishing within the Corner Inlet Marine Sanctuary as it is a significant component of the finfish catch within the recommended marine protected areas. It is important to note that these figures are based on the historical yield of the fishery in the recommended areas, and do not necessarily translate to a financial loss to the fishery. For example, some fish eg Australian Salmon, are not resident in a particular area and will continue to be caught outside the parks. For abalone, effort will need to be redirected to areas outside the recommended parks. It is possible that, for the rock lobster fishery, marine national parks may lead in the longer term, to stock enhancement in adjacent areas. In some overseas cases 'no-take' marine reserves have been used for this purpose.

Commercial fisheries in Victoria include both the wild fisheries (abalone, rock lobster and scalefish) and marine aquaculture. The ECC's recommendations for marine aquaculture areas have

the potential to assist in development of a much larger marine aquaculture industry with potentially large economic benefits for, in particular, rural areas.

Information on other social and economic impacts of the recommended marine protected areas has been gained through discussions with community groups and individuals, local government and other government agencies. This information, although generally qualitative rather than quantitative, has been extremely useful in developing and refining recommendations.

Although it is difficult to assess the effects of the creation of a marine national park on local communities, positive social and economic outcomes are commonly associated with terrestrial national parks, largely through conservation and enhancement of the environmental resource, and in some areas, through stimulus to tourism and some forms of recreation. In some areas creation of a park can provide a focus for attracting visitors and be used as a marketing tool to boost tourism in the area. There have certainly been major benefits to some local communities from the creation of terrestrial parks, but the extent to which this will occur for marine parks is less clear, although international, and some local experience, has been positive.

The negative effects of the creation of marine national parks on recreational fishers and associated local businesses are similarly speculative. For example, if 10% of a local fishing area is unavailable, will fisher numbers be reduced by 10% or will the same numbers simply fish the remaining 90% of area that is available? Other factors influencing socio-economic effects are the proximity of alternative fishing areas; whether, in the longer-term, fish stocks are enhanced in adjacent waters; and the timeframe over which the effects are assessed.



4. Other information sources

In addition to input provided through written submissions and the consultation program, the work of the ECC is based on the best available information, obtained through collation of existing data and commissioned research.

Several studies have been commissioned by the ECC or LCC, and other research projects have also provided valuable information. These reports are fully referenced on pages 121–124, and are available for inspection on request. The following are the major studies which contributed to the development of the draft recommendations.

Environmental inventory of Victoria's marine ecosystems, Stage One: Biophysical classification, and Stage Two: A physical classification of Bass Strait waters^{1,2}

The Council has used a biophysical regionalisation to classify marine and coastal environments – an approach similar to that based on systems used for terrestrial environments. The Council and the then Department of Conservation and Natural Resources jointly developed the marine biophysical regionalisation with the help of external consultants. This process links with the national regionalisation program, the Interim Marine and Coastal Regionalisation for Australia (IMCRA—see below). The Victorian project identified six biophysical regions: five open coast regions and a single region for bays, inlets and estuaries. Of these, five (four open coast regions and a bay region) were incorporated into the IMCRA.

*Interim Marine and Coastal Regionalisation for Australia (IMCRA)*³

The IMCRA is a series of maps and descriptions of Australia's marine waters, that identifies regions with biological and physical characteristics distinct from those elsewhere in Australia. On the basis of the Victorian study

described above, five regions for Victoria were incorporated into the IMCRA (see Appendix 4). IMCRA was developed through the collaborative efforts of State, Northern Territory and Commonwealth marine conservation and research agencies. It was endorsed by the Australian and New Zealand Environment and Conservation Council in June 1998 as a key element of the Strategic Plan for the Establishment of a National Representative System of Marine Protected Areas.

*Occurrence of selected species of intertidal and shallow subtidal invertebrates at Victorian locations*⁴

The Marine Research Group (MRG) data on common intertidal invertebrates is the only high-resolution marine biological dataset which covers the entire Victorian coastline. For this reason the MRG was commissioned to analyse and summarise its database of marine invertebrates. The report was based on 282 species of well-known intertidal and shallow subtidal macro-invertebrates recorded at 215 locations along the Victorian coast. The MRG analysis assessed the diversity of these invertebrates on rocky shores and shallow subtidal reefs and variation with substrate rock type: basalt, granite, limestone, calcarenite and sandstone. Areas with a particularly high diversity of species were also identified.

*Sites with important biological and ecological values*⁵

Using all available data on biology and ecology of the Victorian marine environment, including the report by the Marine Research Group (see above), a



working paper entitled *Sites with important biological and ecological values* was prepared by the LCC. Five criteria were used to systematically assess and compare all data: high diversity of habitats; high diversity of species; habitats for rare, endangered, uncommon or depleted species; nursery, feeding, breeding or rest areas; and rare or unique habitats. Other sources used included site specific studies in Portland, Port Phillip Bay, Western Port, Bunurong, Wilsons Promontory, Corner Inlet/ Nooramunga, Ninety Mile Beach, and East Gippsland areas.

Recreational fishing studies:

***Saltwater recreational fishing in Victoria: A questionnaire survey of recreational fishers and marine recreational fishing catch and expenditure in Victoria*^{6,7}**

Although recreational fishing is a wide spread leisure activity of very significant social and economic importance, there are few reliable data on its value. Moulton (1995) reviewed the existing literature on recreational fishing including the survey of saltwater recreational fishers (Craig 1994). Moulton's report confirmed the economic and social importance of recreational fishing. Two major findings were that up to half a million anglers spent about one billion dollars a year on recreational fishing, and that the recreational catch was equal to the commercial catch for some areas and some fish species.

***Consultation with Victoria's coastal Aboriginal communities*^{8,9}**

Following a suggestion from representatives of Victoria's Aboriginal communities the Land Conservation Council appointed a liaison officer to consult with coastal Aboriginal communities regarding their interest in the LCC marine investigation. Two reports outlining results of the consultation on the Proposed Recommendations (1994) and Draft Final Recommendations (1995) were produced. Aboriginal communities expressed concern about access to land and sea (including access to marine resources), environmental quality, management of catchments that drain to the coast, the status of a range of natural resources (including fish), and the need for an integrated approach to coastal planning.

***Fishing techniques and their impacts*¹⁰**

Many concerns were raised about the impacts of various fishing techniques on marine biota and the seabed, particularly of netting on bay environments, and scallop dredging and seine and trawl fisheries on the offshore environment. A small task group comprised of Peter Moulton, LCC; Steven McCormack, NRE Fisheries; and Dr Greg Jenkins, Victorian Institute of Marine Science, was established to provide information on these issues. Fifteen techniques were assessed, for their impact on seabed and biota, and the level of bycatch taken.

***Victorian coastal towns survey: A socio-economic study of coastal towns*¹¹**

Coastal towns often rely to a large extent on marine based resources. To estimate the contribution of marine resources in the social and economic make-up of the towns, nineteen coastal towns were assessed. Considerable variation was shown across towns. Commercial fishing was a major contributor, especially where abalone and rock lobster harvesting were the main fishing activities, and where the number of fishers in relation to population was high. Recreational fishing was often a significant activity in bay and coastal towns with good coastal access.

***Scuba dive surveys of selected areas*^{12, 13, 14}**

A number of sites with reported important biological values were identified through the consultation process. To assess the values of these sites and potential measures needed for their protection, a number of dive surveys were undertaken.

***Socio-economic assessment of Draft Final Recommendations covering marine, coastal and estuarine areas in Victoria*¹⁵**

During the later stages of the preparation of the Draft Final Recommendations of the LCC Marine and Coastal Investigation, a social and economic assessment of the recommendations was undertaken. The consultants concluded that the principal benefit from implementing recommendations would be conservation and enhancement of the value of the environmental



resource. Benefits for aquaculture were considered to be potentially large, and other benefits were associated with tourism and recreation. The principal costs were associated with constraints on existing uses, mainly commercial fishing. The evaluation of the latter was criticised by commercial fishers as inaccurate and far below the real value. Subsequently studies to reassess this value (see below) were commissioned by the ECC.

Substrate mapping of Victorian coast from satellite imagery¹⁶

The Council cooperated with the National Parks Service in a project using satellite imagery to map Victoria's nearshore marine habitats. The initial part of the project was undertaken by CSIRO's Division of Fisheries. The resulting map covered the entire Victorian coast and indicated the location and extent of nearshore low profile reefs, heavy reefs and sand.

Offshore survey of selected areas^{17, 18}

Three surveys were conducted to expand the knowledge about the least known component of the Victorian marine environment – deep subtidal waters, and to find out if areas, some of which would be considered as candidates for marine parks, met the criteria of biophysical representation. These surveys identified and described the subtidal substrates occurring in selected offshore areas of the Victorian marine environment. The locations of rocky and soft substrates, their depth and extent, geology and a qualitative assessment of benthic communities were described for 23 areas. Study areas varied in size between 11 and 17 km².

Bays and inlets scalefish fisheries review¹⁹

At the request of the then Minister for Agriculture and Natural Resources, the Fisheries Co-Management Council undertook a review of Victoria's bay and inlet scalefish fisheries, with the aim of providing a balanced and shared use

of the scalefish resources by the community. Several reports were prepared for this review including: collation of background information on fish species and bay and inlet features relevant to the review; influence of environmental and habitat features on scalefish catches; review of scalefish fishing practices including their sustainability, environmental impacts, and effectiveness of current management; impacts on fish markets of varied scalefish catches; and socio-economic impacts of future management options based on estimating net benefits of fisheries.

Value of fisheries resources^{20,21,22}

To assess the potential impact of ECC recommendations on the commercial fishing industry, Council commissioned the Marine and Freshwater Resources Institute to obtain catch weights and values of commercial fishing in a number of areas of the bays and the open coast, some of which could be considered as candidates for marine parks. The data provided were based in part on catch and effort information and in part on interviewing a sample of commercial fishermen.

Victorian reefs: Association between biological communities and rock type²³

Previous work commissioned by the LCC indicated that intertidal and shallow subtidal geology may be a significant factor influencing the composition of marine communities. A study was commissioned to determine if a similar correlation existed for deeper subtidal waters, that is, if a difference between biological communities could be due to a different rock type (geology) in deeper subtidal environments. The study suggested that, at the sites examined, a number of physical factors influenced marine life, including substrate complexity, but that geology alone was not a major factor.



Addressing the Terms of Reference

5. Integrated management of Victoria's marine and coastal environment

Management of the marine and coastal environment should focus on providing an appropriate overall balance of uses, optimising social and economic benefits to the whole community, including future generations, while ensuring long-term sustainability of these activities and protection of environmental values. Highly protected areas are a cornerstone of strategies to protect biodiversity and to ensure ecologically sustainable use.

Protected areas on land, such as national parks and conservation reserves, have been features of the environmental management of most countries for decades. The creation of highly protected areas is very important for biodiversity conservation, but it is not enough. Marine protected areas must be integrated with sympathetic management of other values and areas in the whole marine and coastal environment. On land, our park system is complemented by management of other areas such as State forests and private land. For marine and coastal areas, marine protected areas should be complemented by effective catchment management, sustainable fisheries management, pollution control, and control of introduced marine pests.

Activities in parks and protected areas and other sectors such as fishing, tourism, aquaculture, shipping, coastal development and petroleum must be planned for and managed together so they are compatible with each other and the environment. Integrated planning is essential across the whole of Victoria's marine and coastal environment, including the bays, inlets and estuaries, as well as the adjacent foreshore land and catchments that drain to the coast.

The ECC is recommending guidelines for management of the marine and coastal environment outside recommended marine protected areas and aquaculture areas (see pages 22–24). The guidelines are intended to ensure that resource use is sustainable and that significant environmental values are protected while social and economic benefits are optimised.

The recommendations have been developed in the context of international, national and state obligations. Many recent strategies and plans, such as the Victorian Coastal Strategy, the Biodiversity Strategy and the Victorian Aquaculture Strategy, address aspects of marine, coastal and estuarine management in detail. A major initiative at the Commonwealth level is the development of Australia's Oceans Policy. These major strategies and programs are outlined below.

5.1 National and State context

Victorian Coastal Strategy (1997)

The Victorian Coastal Council (VCC) was appointed under the *Coastal Management Act 1995*. One of the VCC's major tasks was to prepare a strategic plan for the whole of the Victorian coast. That plan, the Victorian Coastal Strategy, was released in November 1997.



The Victorian Coastal Strategy provides a framework to ensure the following outcomes for Victoria's coast:

- ensure the sustainable use of natural resources,
- ensure the protection of significant environmental features of the coast,
- provide clear direction for the future use of the coast including the marine environment, and
- identify suitable development areas and development opportunities on the coast.

When preparing the plan, the Victorian Coastal Council liaised closely with both the LCC and the ECC to ensure compatibility between the studies. Although there was some overlap, generally the VCC placed greatest emphasis on the land, whereas the LCC/ECC investigations are more strongly related to the marine environment. Another significant difference is that the LCC/ECC investigations are confined to public land whereas VCC planning relates to public and private land.

Appendix 3 of this report provides more information on the Victorian Coastal Strategy.

Victoria's Biodiversity Strategy (1997)

Victoria's strategy for the conservation of biodiversity was released in 1997, and included marine, coastal and estuarine environments. The strategy emphasises:

- systematic prevention or reduction of the causes of biodiversity decline or loss,
- ecologically sustainable management of public lands and waters by government agencies in association with resource based industries,
- cooperative management of biodiversity on private land, in partnership with landholders, the community, catchment management authorities and local government,

- every community and bioregion forming an integral part of our living wealth, and
- a reporting framework for monitoring progress.

Victorian Aquaculture Strategy (1998)

The purpose of this strategy, released in late 1998, is to develop a profitable, diverse, ecologically sustainable and well-managed aquaculture industry. The Victorian Aquaculture Strategy aims to provide a framework for the development of the Victorian aquaculture industry by (among other things):

- assisting in the identification and development of new areas for aquaculture,
- implementing effective environmental management performance standards, and
- establishing supportive legislative, policy and administrative frameworks.

Australia's Oceans Policy

The Commonwealth Government released Australia's Oceans Policy in December 1998, and announced the allocation of \$50 million over three years for a range of actions associated with its implementation. Central to the policy is ecosystem-based management of Australia's marine jurisdiction to be implemented through a regional marine planning process. Regional Marine Plans, based on large marine ecosystems, are intended to integrate sectoral commercial interests and conservation requirements. In developing Regional Marine Plans, the Commonwealth is seeking the participation of the relevant states and territories, to ensure, as far as possible, the integration of planning and management across State and Commonwealth waters.



Commonwealth Environment Protection and Biodiversity Conservation Act 1999

This Act, which comes into force on 16 July 2000, identifies six matters of national environmental significance (NES):

- World Heritage properties
- wetlands of international importance (Ramsar Convention)
- nationally threatened species and communities
- migratory species
- nuclear actions
- Commonwealth marine areas.

Activities, or actions, which may have a significant impact on a matter of NES, will be subject to Commonwealth assessment and approval, unless State assessment processes have been accredited by the Commonwealth.

Major activities and actions in Victoria, with a potential significant impact on a matter of NES in the marine and coastal environment, will be subject to assessment and approval under the Act. It is therefore possible that new developments, such as marine aquaculture operations, may require assessment and approval under the Act.

Fisheries management under the Offshore Constitutional Settlement

The Offshore Constitutional Settlement (OCS) allows for arrangements to be made between the States and the Commonwealth on resource and conservation matters for marine waters (except bays, inlets and estuaries). This simplifies the management of resources, particularly those that straddle the State/Commonwealth boundary. For the purposes of fisheries management the OCS provides for the Commonwealth to be given jurisdiction for specified fisheries within Victorian territorial waters, and vice versa. Victoria's territorial waters extend seawards to three nautical miles from high water mark. For example, Victoria manages some Commonwealth

waters with respect to abalone, and the Commonwealth manages some Victorian waters with respect to Royal Red Prawns.

Adjustments to Commonwealth fisheries arrangements may be necessary as a result of Victorian Government decisions on establishment and management of marine protected areas. The Memorandum of Understanding accompanying the OCS arrangements between Victoria and the Commonwealth ensures such decisions are able to be implemented.

5.2 International listings of important conservation areas

There are three ways in which areas in Australia may receive international recognition for their conservation values: under the World Heritage Convention, the Convention on Wetlands of International Importance (the Ramsar Convention), and the UNESCO Biosphere Reserves Program. Although these designations do not have a legal foundation, they act as 'overlays' for areas with a range of land tenures, not all of which may be recognised as protected areas.

There are no World Heritage Areas in Victoria.

Wetlands of International Importance

The Ramsar Convention aims to promote the conservation of wetlands and waterfowl, to establish nature reserves on wetlands, to provide adequately for their protection and management and to train personnel competent in the fields of wetland research and management. Four coastal marine areas in Victoria are designated as Wetlands of International Importance under the Ramsar Convention:

- Port Phillip Bay (western shoreline) and Bellarine Peninsula
- Western Port
- Corner Inlet (includes Nooramunga area)
- Gippsland Lakes.



Two other international agreements that act to protect migratory birds are the Japan-Australia Migratory Birds Agreement (JAMBA) and the China-Australia Migratory Birds Agreement (CAMBA). The Agreements recognise that certain species of birds migrate between the two countries and that both countries will conserve the habitats of these species.

Biosphere Reserves

Biosphere Reserves are areas nominated by a UNESCO member state which, because of their characteristic plants and animals and the way they are used by humans, have been given international recognition by the Man and the

Biosphere Programme of UNESCO. A Biosphere Reserve contains gradations of areas which have been modified by human activity, with a core area or areas devoted to long-term protection, and one or more surrounding buffer zones in which activities compatible with the conservation objectives may be carried out.

Two coastal areas in Victoria have been designated as Biosphere Reserves by UNESCO:

- Croajingolong National Park, and
- Wilsons Promontory National Park.



5.3 Management objectives

In the ECC's Interim Report published in February 1998, objectives were established that were aimed at achieving the sustainable use of resources, protecting significant environmental values, and maximising social and economic benefits in marine, coastal and estuarine areas. Management objectives for coastal land are established in the Victorian Coastal Strategy (see Section 5.5).

At present, most of Victoria's seabed and associated waters are unreserved Crown land. This is a stark contrast with the terrestrial environment, where very little public land remains unreserved. Reservation under the *Crown Land (Reserves) Act 1978* assists planning and management by providing a clear legislative framework, specifying objectives for use and management, and clearly nominating a land manager.

Recommendations

R1 The ECC's recommended objectives for use and management of Victoria's marine waters are to:

- conserve natural ecosystems and associated biota
- maintain the water and sediment characteristics of natural ecosystems and, where these are degraded, progressively improve them
- protect significant natural and cultural heritage features
- provide for traditional use and cultural activity by Aboriginal people
- provide for some areas of minimal disturbance which can be used for scientific study
- provide opportunities for recreation, education, and tourism
- provide opportunities for ecologically sustainable harvesting of fish and other biota from wild stock
- provide opportunities for ecologically sustainable marine aquaculture
- provide for the exploration and extraction of earth resources, including oil and gas
- provide for the development of renewable energy resources
- provide for shipping operations and associated port infrastructure and navigation aids
- provide for sea-floor pipelines and communication lines.

R2 A Coastal Waters Reserve be established for the major portion of Victoria's marine area that is not otherwise designated for a particular purpose (eg marine protected area, aquaculture area). The primary objectives for the reserve be:

- (i) to provide for a diverse range of activities (as in R1 above) that are compatible with long-term sustainable use, and
- (ii) to provide for the integrated management of Victoria's marine, estuarine and coastal area.

The area be reserved under the *Crown Land (Reserves) Act 1978* and managed by the Department of Natural Resources and Environment.



5.4 Management recommendations

The ECC has previously published recommended management guidelines relating to public land and resources across the whole marine, coastal and estuarine area (Interim Report 1998). Draft management guidelines and recommendations were published for comment, under several headings, including catchment planning, Aboriginal interests, environmental quality, introduced plants and animals, earth resources, and management and enforcement. Many of those recommendations are now the subject of actions in Government strategies and programs.

In general, such actions are not reproduced below, unless additional points are proposed.

The ECC stresses the importance of properly resourcing and implementing these programs, as the outcomes are critical to maintaining the natural, cultural and economic values of the marine, coastal and estuarine environment.

The following recommendations focus on subjects that the Council believes require particular emphasis in order to ensure protection of natural and cultural values and sustainable use of marine and coastal areas.

Recommendations

Protection of biodiversity

- R3** Further research be undertaken on community composition and structure both within and external to marine national parks with an emphasis on assessing the impacts of harvesting marine fauna.

Catchment planning

- R4** Catchment management authorities ensure that regional catchment strategies specifically address the impacts of land use and management on the marine and estuarine environment, particularly where important physical or biological features may be affected.

Environmental quality

- R5** A strategy (including targets) be developed by the Environment Protection Authority (EPA) in consultation with relevant local authorities to phase out the disposal of waste to estuarine waters.
- R6** The EPA, together with the Department of Natural Resources and Environment (NRE) and other responsible agencies, ensure that the results of water quality and sediment monitoring, as well as audits of licensed point source discharges, are regularly reported and readily available to the public.

Aboriginal interests

- R7** Planning and management relating to traditional interests and uses in coastal and marine areas be based on recognition and respect for the traditional relationship of Aboriginal people with the land and sea.
- R8** A study be undertaken jointly by NRE, Aboriginal Affairs Victoria and Aboriginal communities into the nature of traditional interests and uses in Victorian coastal and marine areas.



- R9** NRE, together with Aboriginal Affairs Victoria, the Fisheries Co-Management Council and the Victorian Coastal Council, review legislation and policies restricting or inhibiting traditional cultural use of public land in coastal and marine areas with a view to removing unnecessary restrictions.

Community education and involvement

- R10** NRE, with local government, catchment management authorities, Coastal Boards and the community, develop an approach to improve co-ordination between Coast Action, Beach Watch and Fishcare groups, and link these with catchment-oriented programs such as Landcare.
- R11** Seed funding be made available for the establishment of Friends groups, especially for new marine national parks.

Compliance

- R12** Government should review both the level of resourcing and strategies for marine compliance programs.
- R13** Compliance strategies should contain provisions to actively encourage community involvement and self-regulation.
- R14** Changes to management regimes and regulations should be well publicised, apply to clearly defined areas, and be accompanied by an appropriate level of education and enforcement.

Introduced plants and animals

- R15** Measures be implemented to reduce the risk of marine pest species arriving in Victoria, and be developed and implemented to ensure a rapid and effective response in the event of an introduction.

Harvesting and production of marine biological resources

- R16** Fisheries management plans for all major fisheries be in place within five years.
- R17** Fisheries management plans should address the impacts of techniques that involve towing or dragging gear along the seafloor, including consideration of alternatives and establishment of control sites. Note that in some cases marine national parks or marine sanctuaries could act as controls.
- R18** The regulations relating to spear fishing be amended to prohibit the use of SCUBA or hookah.
- R19** Fisheries Victoria review the coverage of the Fisheries Regulations restricting the recreational take of intertidal molluscs and other intertidal invertebrates (formerly the Shellfish Protection Regulations), and extend the restrictions to additional areas in Victoria if necessary.



Recreation and tourism

R20 Where tourism activity occurs on public land (including waters), a contribution be made where appropriate and practicable by the tourist operator or individual visitor, through appropriate fees or licences, which can be applied to the protection and maintenance of the area or relevant values.

Research, inventory, monitoring and auditing

R21 Priority be given to establishing monitoring programs:

- for marine national parks to determine the extent to which these areas are meeting their objectives, and
- for areas of resource use to help assess whether the use is sustainable.

R22 Where data collection, research and monitoring is associated with resource use, the user-pays principle be applied as appropriate.

Risk assessment and management

R23 NRE assess and coordinate management and reporting of risks to the conservation and sustainable use of marine and coastal resources within Victoria's marine, coastal and estuarine area.



5.5 Coastal reserves

In Victoria most of our coastline, the beach and foreshore remains in public ownership and available for public use. This is a priceless asset not enjoyed in many other parts of the world.

The Victorian Coastal Strategy, a strategic plan for the whole of the Victorian coast, was prepared by the Victorian Coastal Council (VCC), endorsed by the Victorian Government, and released in November 1997.

During the preparation of the Strategy, the VCC liaised closely with the LCC and the ECC, to ensure compatibility between the two planning processes. The background to the development of the Victorian Coastal Strategy and the overall vision statement are included in Appendix 3. Although there is some overlap, generally the VCC placed greater emphasis on the land, while the LCC/ECC investigations have been more strongly focused on the marine and estuarine environments. Another significant difference is that the LCC/ECC investigations are confined to public land whereas the Victorian Coastal Strategy covers both public and private land.

The Victorian Coastal Strategy identified 23 activity nodes along Victoria's coastline which are areas with identified strategic priorities for improved facilities or structures or, where there is a need for detailed planning to control or direct future development in a particular area. These activity nodes could be subject to future review and amendment through coastal planning

processes. The Strategy also identified, at a broad scale, General Recreation and General Protection Zones, for coastal public land outside parks and conservation reserves, based on earlier work by the LCC.

Consistent with the Victorian Coastal Strategy, the Coastal Recreation Zone is areas capable of sustaining recreational opportunities for large numbers of people. This zone should be managed to minimise impacts on remnant values and the coastal environment. The Coastal Protection Zone is areas in relatively natural condition or with significant natural or cultural values, including sites or fragile environments which are sensitive to modification. This zone should contain limited, if any, visitor facilities and access, and be managed to protect the natural values of the zone. The Government has endorsed these coastal land use zones through its approval of the Victorian Coastal Strategy.

The ECC has adopted the terms Coastal Recreation Zone and Coastal Protection Zone, and has identified these zones at a finer scale in conjunction with the VCC. These are mapped at a scale of 1:350 000 in Map A accompanying this report. Some changes have been made to the zoning, as a result of additional information being available at a local or regional scale. More detailed maps at approximately 1:100 000 are available upon request from the ECC, or for inspection at local government offices, NRE offices and regional coastal boards, to allow interested parties to comment on issues at an appropriate local scale.

Recommendation

R24 That the Coastal Recreation and Coastal Protection Zones shown on Map A be incorporated into the Victorian Coastal Strategy.



6. Marine protected areas

The ECC's terms of reference require it to investigate and make recommendations on a preferred approach and priorities for the progressive establishment of a representative system of marine parks in Victoria. Protected areas on land, such as national parks, have long been accepted by the community as a key component in the overall good management of the environment. In Victoria, approximately 15% of land is in highly protected parks or conservation reserves. By contrast, at present only 0.05% of Victoria's marine environment is highly protected.

6.1 Protection of biodiversity

Highly protected areas are established especially for the conservation of biodiversity. These areas are a critical component of integrated ecosystem management of the whole marine environment.

Biodiversity refers to the natural variety of life on earth, the sum of all our native species of plants and animals, the genetic variation within them, their habitats, and the ecosystems of which they are a part. Animals and plants are closely associated with their habitat. Survival of individual species and communities depends directly on habitat protection, and is best achieved in the natural environment, rather than in zoos or aquariums.

Despite considerable research interest in Victoria's marine environment, there are many areas in which information is lacking or even completely unavailable. Several reports summarise the state of knowledge of the natural values of the State's marine and estuarine environments¹. Scientists have concluded that a complete inventory of biodiversity is not a realistic goal for terrestrial and much less, for marine environments. In the first place, most species have not been described and named. Secondly,

even if they were known it would be an impossibly demanding task to determine patterns of distribution. As a result, many forums have concluded that habitats and ecosystems can appropriately serve as the basic units of biodiversity for most purposes.

In the long term, information about species and genetic varieties will undoubtedly be improved. In the short term, it is important for the protection of biodiversity that decisions are based on the best possible information available. One widely adopted approach is to generalise the available information on species into categories, such as communities, habitats or ecosystems.

The draft recommendations in this report are based on a nationally-agreed regional ecosystem-based classification for the Australian marine environment that recognises five biophysical regions in Victoria:

- Western region: South Australian border to Cape Otway
- Central region: Cape Otway to west of Wilsons Promontory



- Wilsons Promontory region: the Promontory itself to the western extent of the Ninety Mile Beach
- Eastern region: Ninety Mile Beach to the NSW border
- Embayments region: all bays, inlets and estuaries.

This framework, the Interim Marine and Coastal Regionalisation for Australia (IMCRA), is outlined in Appendix 4. The IMCRA classification was developed using both a qualitative expert approach and quantitative analytical methods, reflecting the range of available methodologies and the highly variable quality and quantity of data available.

Victoria's underwater environments are special, often containing spectacular landscapes, a rich flora and fauna, and many species which are found only in south-eastern and southern Australia. In recent years many Victorians have increased their awareness of the special values of their marine environment. In terms of spectacle, our waters are magnificent, if less easily observed than tropical waters. Features such as kelp forests towering 30 metres from the sea floor are unique to temperate waters, and there are many reef environments where the colour and variety of flora and fauna and the numbers of fish create an underwater landscape that is comparable to tropical coral reefs.

The southern coast of Australia is the only major south-facing coastline in the southern hemisphere. It has been relatively isolated for some 65 million years, and as a result Australia's southern waters are unique. They support the world's highest diversity of red and brown seaweeds, sea mosses, crabs and shrimps, and sea squirts. A remarkable feature is that 90–95% of species in most groups occur only in southern waters and nowhere else on earth. Our southern marine communities are as distinctively Australian as our terrestrial marsupials and other flora and fauna.

6.2 Recommended approach to marine conservation

The ECC is recommending improving marine environmental conservation through the progressive development of a system of protected areas supported by good environmental management practices over the whole of Victoria's marine area.

Systems of protected areas have been established in most countries to preserve in perpetuity representative samples of ecological, geological and scenic values of many regions. While well established as a land management practice, the concept of parks is yet to be applied in any significant way to the marine environment.

Victoria has responsibilities and obligations for the protection of marine biodiversity and ecosystems under a number of national and international strategies and conventions to which it is a signatory, such as:

- the Convention on Wetlands of International Importance (the Ramsar Convention) (1971),
- the Convention on Biological Diversity (UNEP 1994),
- the National Strategy for Ecologically Sustainable Development (1992),
- the National Strategy for the Conservation of Australia's Biodiversity (1996),
- the Intergovernmental Agreement on the Environment (1992), and
- Japan-Australia and China-Australia Migratory Birds Agreements (JAMBA 1974 and CAMBA 1986).

Several strategies such as Victoria's Biodiversity Strategy and the Victorian Coastal Strategy have specific objectives relating to the establishment of a representative system of marine protected areas. This investigation forms a major part of that commitment.



One of the lessons learned from what we now regard as poor land management practices over the last century, is that we need to be cautious in the management of our marine resources and ensure that some areas are maintained in as natural a state as possible, as a benchmark against which to measure impacts of use.

Because almost all the coastline and seafloor is publicly owned, there is an opportunity to develop a coordinated planning approach for the area. Many recent studies and reports have emphasised the need to adopt an integrated approach to marine management, employing a range of mechanisms for the best possible protection of Australia's marine environment. One of these mechanisms, firmly established in international and national strategies such as the Convention on Biological Diversity (UNEP 1994) and the National Strategy for Ecologically Sustainable Development (1992), is the establishment of a representative system of protected areas. This approach is strongly advocated by the ECC.

6.3 A comprehensive, adequate and representative system of marine protected areas

If Victoria is to adequately protect our valuable marine environments, the system of parks and conservation reserves we put in place must be **comprehensive, adequate and representative**.

Goals and principles for systems of protected areas have been established in other areas; for example the goal of a comprehensive, adequate and representative system of reserves for Australia is recognised by all Commonwealth and State/Territory signatories to the National Strategy for Conservation of Australia's Biodiversity (1992) and the National Forest Policy Statement (Commonwealth of Australia 1992).

The description below of the system of marine protected areas is consistent with the principles for developing the National Representative System of Marine Protected Areas as recently endorsed by the Australian and New Zealand Environment and Conservation Council.⁵⁴

Establishing a comprehensive, adequate and representative system

Comprehensive means a system which protects examples of the full range of habitats and biological communities within each of Victoria's marine biophysical regions.

Adequate means parks and other conservation reserves that have practical boundaries, are of a sufficient size to ensure that physical and biological values can be protected and the impact of adjacent activities minimised, and that more than one example of each environment is protected.

Representative means that parks and other conservation reserves reflect the diversity of the flora and fauna within each of the protected habitats and biological communities.



6.4 ECC's response to major issues raised in relation to marine protected areas

Throughout the investigation, the ECC has carefully considered all submissions and views expressed during consultations. This section summarises the major issues raised in relation to marine protected areas and Council's response to these issues.

Establishment of a representative system of marine protected areas

The majority of submissions following the ECC's Interim Report (1998) supported the creation of a representative system of marine parks. A number of submissions advocated management of the whole of the Victorian coastal waters rather than having individual parks where activities such as commercial and/or recreational fishing were restricted. It was suggested that marine parks were only necessary where there was inadequate fisheries management and that this was not the case for Victoria. Some believed that appropriate regulation of the commercial and recreational fishing sectors would be sufficient to protect fish stocks and all other values.

Some submissions could not see the benefit of "no-take" areas for fishing, especially for pelagic species. Others saw them as imperative in sustaining depleted fish stocks and stressed the need for large sanctuary zones within which natural ecological processes could occur. Many submissions proposed specific areas for sanctuary zones along the coast. Some submissions called for 10 or 20% of the area within marine parks to be sanctuary zone. Others called for 15% of each bioregion or each habitat to be highly protected in "no-take" zones. Others were opposed to the establishment of marine parks to meet a quota or percentage target. It was often submitted that the current proportion of "no-take" or highly protected areas in Victorian waters (0.05%) was inadequate by any measure.

The likelihood of adverse social and economic impacts of sanctuary zones on recreational and commercial fishers, associated industries and local communities and towns was often raised in submissions and consultations. Others considered that highly protected areas could be a tourist drawcard, bringing in revenue to local economies, especially over the longer term.

Many submissions on the LCC's Draft Final Recommendations (1996) supported the establishment of the marine parks and sanctuary zones recommended in that report. Although some were of the view that the recommended areas were too small, others thought they were too large. Comments were made on the need to clarify the objectives of sanctuary zones and marine parks, their selection criteria, and the criteria for determining their size. Many considered that the size of the zones was too small in terms of buffering capacity from the activities allowed in marine parks. Some believed that the zones were too small to provide undisturbed examples of ecosystems and that they should represent 10% or more of Victoria's marine environment. There were also those who proposed that smaller sanctuary zones would be adequate or that they were unnecessary. The issue raised most frequently about the specific marine parks recommended in the LCC's Draft Final Recommendations was the impact of sanctuary zones on commercial and recreational fishing.

Response

The above discussion covers the major issues raised repeatedly in submissions and meetings. The ECC has responded to these issues by revising the principles for selection and management of marine protected areas. (see section 6.5), and by significantly changing locations and boundaries of recommended marine parks in order to minimise social and economic impacts.



Multiple use approaches to marine protected areas

In recent discussions with stakeholders, several groups questioned why the ECC was proposing to recommend highly protected areas, instead of multiple-use parks in which harvesting is allowed to continue in much of the area. A belief was often expressed that fishing and harvesting activities do not harm the environment and that a multiple-use management regime can therefore be effective in meeting conservation objectives. Other comments were made that protected areas will be ineffective in protecting highly mobile fish species, and that other impacts on the marine environment are so great as to make establishment of marine parks futile. It was frequently said that the marine environment should be managed as a whole and that it is unnecessary to "lock up" areas as marine parks.

However, the ECC also received consistent input from commercial and recreational fishers that large multiple-use parks were not viewed favourably, largely because of the perceived potential for future restrictions on fishing, but also because of the difficulty of communicating complex regulations restricting various categories of fishing in different parts of the park. Conservation and environment groups also criticised large multiple-use parks because of the perceived absence of clear conservation objectives and measures for the areas. Existing multiple-use parks such as Corner Inlet were sometimes cited as evidence of the lack of clear management intent. Some scientists commented on the difficulty of assessing the performance of large multiple-use parks outside of the highly protected sanctuary zones.

Response

There is an ongoing global debate about the relative merits of highly protected areas and multiple-use areas. Much of the dispute arises from the misconception that these are two fundamentally different approaches. In fact nearly all large multiple-use marine parks encapsulate highly protected zones, which form the core of the park.

The ECC is persuaded that large multiple-use marine parks, in which fishing and other harvesting and extractive uses are permitted in most of the zones, send confusing messages to the community about the purpose of the parks. In order that the purpose of the parks can be clearly communicated and the management regime simply explained and implemented, a system of highly protected marine national parks is proposed. Monitoring of the performance of the parks will also be simplified.

It is essential that the marine environment be managed as a whole, in a way that maximises benefits to present and future generations of Victorians. As on land, this may involve setting aside different areas for different uses, such as aquaculture, ports or biodiversity protection. Balanced use is achieved by having a mix of uses over the whole of Victoria's marine environment, and not by allowing every use in every area. The recommendations in this report will ensure that more than 93% of waters will remain available for sustainable uses such as fishing, oil and gas exploration and extraction, aquaculture, ports and shipping.

Although many fishing techniques do not damage the environment, it is clear that targeted harvesting of fish or any marine species alters the ecosystem of which they are part. The only way in which these effects can be objectively assessed is to set aside areas in which there is no harvesting, for long-term comparison with harvested areas.

(continued next page)



Response (cont.)

Some fish and other marine species are highly mobile, others less so. Even some highly mobile species have stages when they are relatively sedentary and protected areas can provide major benefits. For example, Logan's Beach near Warrnambool is a nursery area for Southern Right Whales and it is widely recognised that shallow inlets and bays such as Western Port and Swan Bay in Port Phillip are critical habitat for juvenile fish and sharks. Similarly, on land some birds that nest in protected coastal wetlands in Australia fly to and from Siberia every year.

Degradation of the marine environment from oil spills, land-based pollution and invasion by introduced pest species is a legitimate concern, which must be addressed whether or not marine protected areas are established. These and similar issues are the subject of targeted programs involving partnerships of government, industry and the community. For example, every sewage outfall in Victoria now has at least secondary treatment before being discharged to marine waters, and management of agricultural land to reduce erosion and fertiliser runoff is being addressed by catchment management authorities, Landcare groups and Coastal Boards.

Terminology

A large number of submissions called for a different nomenclature to be adopted. A preference was shown for the IUCN terminology of Marine Protected Areas rather than Marine

Parks, and for highly protected Sanctuary Zones and Special Nature Sites to be called Marine National Parks.

Response

A difficulty faced by the ECC is that there is very little consistency either nationally or internationally in nomenclature for marine protected areas. The Council has adopted terminology that is as consistent as possible with usage in other jurisdictions, and that is intended to clearly communicate the protection status of the recommended areas: Marine National Park for the larger highly protected areas, and Marine Sanctuary for smaller sites with special values that require a high level of protection. The term Marine Conservation Park is used for larger areas where some extractive uses are permitted, and Marine Special Management Area for smaller areas where some extractive uses are permitted. The Australian and New Zealand Environment and Conservation Council (ANZECC), of which Victoria is a member, has recently endorsed action to develop nationally consistent definitions for marine protected areas which can progressively lead to consistent nomenclature. Consistent with international and national usage, this report uses the term 'marine protected area', which is used generically to include any or all of the above categories.



Scientific basis for marine protected areas

Throughout the investigation a number of issues were raised relating to the scientific basis for the recommendations. A common question is whether or not there are sufficient data to confidently make recommendations about the

location of marine parks and conservation reserves. A related observation is often made that there is no scientific evidence demonstrating that marine parks are effective in protecting marine ecosystems.

Response

While it is true that the marine environment is generally less well understood and documented than the terrestrial environment, sufficient information is available in Australia to describe marine regions on their biological and physical characteristics, including habitat types and species distributions. In a recent global overview of marine protected areas, IUCN The World Conservation Union (1998) commented that it is a mistake to postpone action because biophysical information is incomplete, and that there is usually sufficient information to indicate whether marine protected areas are justified ecologically and to set reasonable boundaries.

For some time there has been solid scientific evidence that highly protected marine parks can play an important role in good overall marine management and protection of biodiversity and other natural values. There is also substantial documentation of the differences in diversity and abundance of fish and other marine species that emerge following the creation of highly protected areas. While much of the early research in this area was conducted in tropical ecosystems, there is now ample demonstration of similar effects in temperate waters such as in New Zealand and Tasmania.²⁶ In Victoria, there are almost no highly protected areas in which such research can be conducted. However even a casual underwater observation at the Popes Eye Marine Reserve (at the southern end of Port Phillip Bay), which has been highly protected for many years, will indicate that fish numbers and diversity are far greater than for comparable areas in Port Phillip Bay.

Arguably, there is no scientific evidence that the existing level of use of the marine environment is sustainable and that therefore it has been suggested that the onus of proof should be reversed. Where information is available in the form of fish catch data, the indications are that harvesting of some species is not sustainable at current levels. For example, the continued decline in catch per unit effort in the Victorian rock lobster fishery raises serious concerns for the future of the fishery. There have been major reductions in other fish stocks for reasons that are not fully understood, such as the once major cuta fishery outside Port Phillip Bay.



Enforcement

A very common concern expressed throughout the investigation is the belief that marine parks will become havens for fish thieves. This concern reflects the reality that stealing fish and shellfish, in particular abalone, is a significant and ongoing problem in Victoria.

Many groups and individuals have expressed the view that the current level of field management,

including enforcement, is unsatisfactory and they doubt that sufficient management resources will be made available to manage newly established marine parks. There have been frequent claims that the existing highly protected sanctuary zone of the Bunurong Marine Park has been stripped bare of abalone.

Response

There is no evidence that stealing is any more prevalent in marine parks than in other areas. The argument is often put that the presence of legitimate users discourages illegal users. There is no evidence that this claim is valid, and it is unclear how this would affect night-time activity when much theft occurs, and legal users are mostly not present. Illegal activities are often masked as legal harvesting, and enforcement officers have stated that policing is actually simpler in highly protected areas where no harvesting at all is allowed.

Field inspections have indicated that there is no basis to claims that abalone populations in existing highly protected areas have been decimated.

It is important to remember that field enforcement is not an end in itself, but is only one means of ensuring compliance with regulations designed to protect the resource and the environment. Education and cultural change can often be of greater long-term benefit in ensuring compliance than direct enforcement.

The appropriate level of enforcement is a matter which is continually under review by the responsible agencies. In early 1999, a package of measures was announced to increase emphasis on fisheries enforcement. It is important to note that all of Victoria's marine waters are already subject to a complex regulatory regime (for fisheries, shipping and navigation, boating, pollution control, oil and gas extraction) which is enforced at present. A change in status of an area does not necessarily mean that an increased enforcement effort is required. However it is likely that at the very least there would be additional initial costs associated with publicity and education, as there is for the introduction of any new management regime.

Notwithstanding the above, there is a common perception across all interest groups that the level of marine enforcement is currently less than adequate, and the ECC has recommended that the level of compliance and enforcement activities continue to be monitored and reviewed.



Boundary identification

Other management concerns relate to the perceived difficulty in identifying marine park boundaries at sea. Many fishers, both commercial and recreational, commented on the likely difficulty in identifying boundaries, and expressed concern about the problems they thought they

would experience with compliance. For example, identifying boundaries without equipment such as the global positioning system was considered to be almost impossible, and marker points on land and buoys at sea were thought insufficient.

Response

While it is necessary to address issues relating to boundary marking, it is worth remembering that fishers must already comply with many regulations and restrictions which require them to identify areas at sea, such as Victoria's coastal waters limit at three nautical miles (about 5.5 km) from the coast, and major shipping channels. The ECC has endeavoured to recommend boundaries that are as identifiable and practical as possible. Approaches currently used include use of markers on the land, buoys and markers in the sea, and the distribution of maps and charts. Strong visual landscape features, depths, longitude and latitude reference and distances from shore all assist users. Electronic navigation aids – particularly Geographical Positioning Systems (GPS) – are now relatively inexpensive and enable boat-based commercial and recreational fishers to accurately determine their position. Ignorance of one's location should not be a legitimate legal defence.

6.5 Principles for the selection and management of marine protected areas

The Terms of Reference for this investigation required the ECC to make recommendations on a preferred approach and priorities for the progressive establishment of a representative system of marine parks in the State of Victoria.

In the Interim Report (1998) the ECC sought input on draft principles for the selection and management of marine parks. The Council has adopted the following revised principles for the selection and management of marine protected areas:

- ❑ There will be a system of protected areas within the marine, coastal and estuarine areas of Victoria which will be comprehensive, adequate and representative.
- ❑ Marine national parks are established to provide the highest level of protection for biodiversity and to maintain representative examples of natural ecosystems in perpetuity.
- ❑ Marine sanctuaries and marine special management areas will be identified to protect sites of special conservation value and to complement marine national parks.
- ❑ Marine national parks must be sufficiently large to achieve their objectives.
- ❑ Marine national parks and marine sanctuaries should provide for a range of non-extractive and non-damaging activities, compatible with the primary aim of conserving biodiversity and ecological processes, and protection of special values.
- ❑ Marine protected areas should generally be located to minimise threats, such as pollution and introduced pests, from surrounding areas.
- ❑ A system of marine protected areas should include some spectacular areas, and should provide opportunities for recreation, tourism, education and enjoyment of the natural environment.
- ❑ Planning for Victoria's marine protected areas will take a long-term view and will provide ongoing protection of the resource.
- ❑ Community education and involvement are vital factors in the successful management of marine protected areas.
- ❑ Management of marine protected areas must be effective, efficient and accountable.



The following arguments were taken into account in recommending a system of highly protected marine national parks as the cornerstone of the system of marine protected areas.

- The objectives of highly protected areas are clear and easily communicated.
- Highly protected areas will provide a scientific reference area against which to assess the impacts of human activities.
- Highly protected areas, although they will occupy only a small percentage of Victoria's marine area, will contribute to improving the balance of uses in the marine environment. Currently 99.95% of the Victorian marine environment is available for commercial or recreational fish and shellfish harvesting, and only 0.05% is highly protected.
- Highly protected areas act as a source of replenishment for certain species for adjacent fished areas.
- These areas act as an insurance measure in the event of there being a fisheries collapse due to natural or human causes in fished areas.
- Monitoring programs to demonstrate the biological effects of establishing highly protected areas are more effective in performance assessment than monitoring programs for general use areas where fishing is permitted.
- Rules about fishing are the same for commercial and recreational sectors.
- Highly protected areas are valuable as education areas.
- Ensuring compliance with regulations is much simpler in highly protected areas.

6.6 Identification and selection of candidate areas for marine national parks

Aside from the principles for selection and management of marine protected areas, the following factors were considered in identifying and selecting areas for inclusion in the marine national parks system.

Biophysical regions. The range of habitats within each of the five biophysical regions in Victoria (detailed in section 6.1) is represented in a system of marine national parks.

Marine habitats. The level of available biological data for the whole Victorian marine environment allowed a general description of eight broad marine habitats, defined primarily by tidal level, substrate type, exposure to wave energy, and dominant flora. They are:

- intertidal rocky shores
- subtidal rocky reefs
- seagrass beds
- sheltered intertidal flats
- mangroves
- intertidal sandy beaches
- subtidal soft substrates
- pelagic (open water) environments.

A more recent classification system subdivides the Victorian marine environment into 17 categories based primarily on complexity of forms of rocky habitats, geological classes²⁴, and grain size, composition and carbonate content of soft sediments²⁵. These new categories include rocky habitat forms such as low profile reef, heavy reef, cobble, boulder and rubble; geological classes of sandstone, limestone, granite, calcarenite, basalt and mudstone; and soft sediments divided into silt, fine, medium and coarse sand, shell grit and shell rubble.



Data were generally unavailable to subdivide these habitats consistently for the whole Victorian coast, although it is clear that there is a great deal of variety within each broad habitat type. For example, *Posidonia* seagrass communities are different from *Amphibolus* seagrass communities; soft sediment communities are known to vary depending on sediment composition, distance offshore and depth; and intertidal reef fauna varies with rock type: basalt, granite, limestone, calcarenite or sandstone.

Replication. More than one example of major habitats in each biophysical region is included to:

- incorporate the variability within each habitat type, and
- to guard against loss due to unforeseen or catastrophic events.

Significant biological and ecological values.

In addition to representative values, special values have been taken into account such as:

- high diversity of habitats
- high diversity of species
- habitats for rare, endangered, uncommon or depleted species
- nursery, feeding, breeding or rest areas,
- rare or unique habitats.

Where there is a choice between candidate areas which both equally represent habitats within a region, and other factors being equal, Council has generally recommended an area which also includes additional special values as above.

Variation in orientation and wave energy. It is known that variation in shoreline orientation and wave energy climate (exposure) can have a major influence on biological communities. Where possible this variation in each habitat type is represented.

Size and position. Parks must be of a sufficient area to ensure that ecological, physical and biological processes are maintained in a natural state, and activities adjacent to the park do not have a significant impact. Scientists agree that larger areas will function more effectively than small areas in protecting marine biodiversity, but there is only limited information available on optimum sizes for marine parks.

Recent scientific monitoring²⁶ of four highly protected reserves in temperate waters in Tasmania confirmed that effectiveness of marine reserves corresponded with reserve size, and found that only the largest reserve, with 7 km of coastline, proved to be effective at achieving species conservation and resource enhancement. The ECC's approach has therefore been to recommend a range of sizes for marine national parks, with a minimum of 5–7 km of coastline. Research and monitoring in these different areas will contribute to information on effective sizes and designs of parks.

Although detailed information is not always available, it is generally accepted that communities of plants and animals change with depth and distance offshore. This is true for both rocky reef and soft sediment habitats. Therefore, where possible parks extend from the shoreline to the limit of State waters at three nautical miles (approximately 5.5 km) to include the variability associated with water depth and distance offshore.

Condition. Where there is a choice between candidate areas, and other things being equal, the ECC has generally recommended areas where the environment and catchment is relatively undisturbed. For example, recommended marine national parks are often adjacent to national parks on land and, where possible, away from discharges and areas of marine pest infestation.



Buffers. Buffers are often used to separate areas zoned for incompatible activities, as a means of reducing the impact of an activity on the adjacent area. In previous LCC recommendations the general use areas of large multiple-use parks acted as buffers around the highly protected sanctuary areas. The ECC has decided against recommending buffers external to the proposed marine national parks, on the basis that the parks are intended to be sufficiently large so as to be viable in maintaining populations, species, communities and ecological processes. Proper management of the whole marine environment, underpinned by the principles of ecologically sustainable use, should ensure appropriate buffers are maintained for different activities adjacent to the parks.

Social and economic factors. Where there is a choice between candidate areas, the ECC has recommended areas where the impact on industry, users and local communities is minimised.

6.7 The proposed system

The ECC is now proposing the following system.

Marine National Parks are highly protected areas which contribute to a system representing the range of marine environments in Victoria, and in which no fishing, extractive or damaging activities are allowed. There are no restrictions on access, and activities such as recreation, tourism, education and research are encouraged. Recommendation A on p 38 gives details of activities that are allowed, restricted or prohibited.

Marine Sanctuaries are smaller highly protected areas designated for protection of their special natural values, in which no fishing, extractive or damaging activities are allowed. See Recommendation B on page 40 for details on activities that are allowed, restricted or prohibited.

Marine Conservation Parks are recommended to capture a number of pre-existing multiple use parks with high environmental values which require ongoing protection. Fishing and other extractive activities are generally permitted, but Marine Sanctuaries (ie highly protected areas) may be included as a zone within the park. See Recommendation C on page 43 for details on activities that are allowed, restricted or prohibited.

Marine Special Management Areas are smaller areas designated (formally through legislation or through other management arrangements) for protection of their special natural values, in which fishing and other uses are generally allowed. See Recommendation D on page 44 for details on activities that are allowed, restricted or prohibited.

A system of twelve Marine National Parks is recommended along the Victorian coast (see Map A at the end of this report) to provide for the protection and management of representative Victorian marine environments. Eleven Marine Sanctuaries and fifteen Marine Special Management Areas are recommended to complement the Marine National Parks, and to protect areas of special ecological and biological interest. Five Marine Conservation Parks are recommended, taking in five existing marine parks. Each of the parks and other protected areas is described fully in Parts Three to Five of this report.



Recommended Marine National Parks

The basis for recommending marine national parks has been outlined in detail in the preceding sections.

Recommendation

A The recommended areas shown on Map A (numbered A1 to A12), to a depth of 200 metres below the seabed, be used to:

- (i) conserve and protect biodiversity and natural processes;
- (ii) maintain natural ecosystems as a reference against which other areas may be compared;
- (iii) provide opportunities for recreation and education associated with the enjoyment and understanding of natural environments, where consistent with (i) and (ii);

that the following activities be permitted:

- (iv) nature observation, scuba-diving, snorkelling, surfing, swimming, non-motorised boating, and wind-surfing;
- (v) boating using motorised craft subject to conditions to be determined by the manager; (Note– restrictions on motorised boating would only be appropriate if the activity is in conflict with (i), (ii) or (iii) above.)
- (vi) research, subject to permit;
- (vii) oil and gas exploration from an aircraft or vessel that does not cause disturbance to the seabed or biota;
- (viii) maintenance and replacement of existing structures;

that the following activities not be permitted:

- (ix) the removal or disturbance of marine biota;
- (x) marine aquaculture;
- (xi) exploratory drilling for oil and gas;
- (xii) oil and gas extraction;
- (xiii) exploration and extraction of minerals and stone;
- (xiv) other activities that cause disturbance to the seabed or biota (such as blasting, dredging and spoil disposal, seaweed harvesting);
- (xv) point source waste discharges;

that:

- (xvi) new seafloor cables and pipelines be permitted, subject to:
 - (a) an Environment Effects Statement, and
 - (b) the consent of the Minister responsible for management of the park, and only after the Minister is satisfied that no reasonable alternative outside the park is available;



that:

- (xvii) the parks be permanently reserved under new or amended legislation and be managed by the Department of Natural Resources and Environment;
- (xviii) a management plan be prepared for each park by the manager, after public consultation, outlining the strategies to be taken to achieve the objectives of the park, and be in place within three years of the Government's acceptance of these recommendations.

Full descriptions and maps of the recommended Marine National Parks below can be found in Parts Three to Five of this report.

- A1** Discovery Bay Marine National Park (see pages 58–59)
- A2** Twelve Apostles Marine National Park (see pages 60–61)
- A3** Point Addis Marine National Park (see pages 62–63)
- A4** Point Cook Marine National Park (see pages 76–77)
- A5** Yaringa Marine National Park (see pages 82–83)
- A6** North Western Port Marine National Park (see pages 84–85)
- A7** Rhyll Inlet Marine National Park (see pages 86–87)
- A8** Bunurong Marine National Park (see pages 96–97)
- A9** Wilsons Promontory Marine National Park (see pages 98–99)
- A10** Ninety Mile Beach Marine National Park (see pages 100–101)
- A11** Point Hicks Marine National Park (see pages 102–103)
- A12** Cape Howe Marine National Park (see pages 104–105)



Recommended Marine Sanctuaries

Marine Sanctuaries complement the recommended Marine National Parks, and contribute to providing a comprehensive, adequate and representative system of marine protected areas. The recommended areas have a range of values, including:

- typical or outstanding examples of habitats not otherwise represented in the recommended system of marine protected areas,
- areas of special scientific significance, and
- areas that provide important opportunities for recreation and education associated with the enjoyment and understanding of the natural environment, such as easy access, interesting or spectacular underwater scenery, clear water or varied and colourful marine life.

These sites are given the highest level of protection.

Recommendation

B The recommended areas shown on Map A (numbered B1 to B11) be used to:

- (i) conserve and protect the biodiversity and natural processes within the sanctuary;
- (ii) provide opportunities for recreation and education associated with the enjoyment and understanding of natural environments, where consistent with (i);

that the following activities be permitted:

- (iii) nature observation, scuba diving, snorkelling, swimming and non-motorised boating and wind-surfing;
- (iv) boating using motorised craft subject to conditions to be determined by the manager; (Note – restrictions on motorised boating would only be appropriate if the activity is in conflict with (i) or (ii) above.)
- (v) research, subject to permit;
- (vi) oil and gas exploration from an aircraft or vessel that does not cause disturbance to the seabed or biota;
- (vii) maintenance and replacement of existing structures;

that following activities not be permitted:

- (viii) the removal or disturbance of marine biota;
- (ix) marine aquaculture;
- (x) exploratory drilling for oil and gas;
- (xi) oil and gas extraction;
- (xii) exploration and extraction of minerals and stone;
- (xiii) other activities that cause disturbance to the seabed or biota (such as blasting, dredging and spoil disposal, seaweed harvesting);
- (xiv) point source waste discharges;



that:

- (xv) the marine sanctuaries be permanently reserved under new or amended legislation and be managed by the Department of Natural Resources and Environment;
- (xvi) a management plan be prepared for each marine sanctuary by the manager, after public consultation, outlining the strategies to be taken to achieve the objectives of the park, and be in place within three years of the Government's acceptance of these recommendations.

Full descriptions and maps of the recommended Marine Sanctuaries can be found in Parts Three to Five of this report.

- B1** Merri River Mouth Marine Sanctuary (see pages 64–65)
- B3** The Arches Marine Sanctuary (see pages 64–65)
- B3** Marengo Reefs Marine Sanctuary (see pages 66–67)
- B4** Eagle Rock Marine Sanctuary (see pages 66–67)
- B5** Point Danger Marine Sanctuary (see pages 68–69)
- B6** Barwon Bluff Marine Sanctuary (see pages 68–69)
- B7** Jawbone Marine Sanctuary (see pages 78–79)
- B8** Ricketts Point Marine Sanctuary (see pages 78–79)
- B9** Mushroom Reef Marine Sanctuary (see pages 107–108)
- B10** Corner Inlet Marine Sanctuary (see page 92)
- B11** Beware Reef Marine Sanctuary (see pages 107–108)



Recommended Marine Conservation Parks

This category is recommended to capture a number of pre-existing multiple-use parks with high environmental values, which require ongoing protection. The ECC is not recommending any new parks in this category. Marine Conservation Parks are areas designated for protection of their special natural values, in which fishing and other uses are generally allowed. Marine Sanctuaries (ie highly protected areas) may be included within Marine Conservation Parks. Many of the existing marine parks, most of which are currently managed for a variety of uses including recreational and commercial fishing, fall into this category. The existing multiple-use parks have a variety of names, including Marine Park, Marine and Coastal Park and Marine Reserve. A change in terminology is proposed to Marine Conservation Park to distinguish these areas from the highly protected Marine National Parks.

Victoria has 12 existing marine parks and reserves, established between 1979 and 1991. The ECC recommended in its Interim Report (1998) that the existing five Harold Holt Marine Reserves in southern Port Phillip Bay be incorporated into the Port Phillip Heads Marine Park. Other than the highly protected Popes Eye Marine Reserve, just two other areas within the existing marine parks currently have the highest level of protection where extractive activities and disturbance are not allowed: part of the Point Cook Marine Reserve, and part of the Bunurong Marine Park.

Without exception the existing marine parks have very significant environmental values, and make a substantial contribution to the representative and comprehensive nature of the marine protected areas system. Three of the existing marine parks, Point Cook Marine Reserve, part of the Bunurong Marine Park and Wilsons Promontory Marine Reserve, are recommended to be incorporated in highly protected Marine National Parks (see Recommendations A4, A8 and A9 in Parts Four and Five of this report). As well, a highly protected area is proposed for part of the Corner Inlet Marine and Coastal Park (see Recommendation B10 in Part Four of this report).

Community understanding and acceptance of many of the existing parks is high. Other than the recommendations outlined above, the existing parks and reserves are recommended to be retained as Marine Conservation Parks to be managed for a variety of uses which do not impact on the values and objectives of the park.

Draft management plans have been prepared for each of these parks over the last ten years. The ECC has made no recommendations with respect to changing the current management practices in these parks (except where all or part has been recommended as a Marine National Park or Marine Sanctuary). The current practices should however be subject to the usual reviews of management which take place from time to time.



Recommendation

C The recommended areas shown on Map A (numbered C1 to C5), be used to:

- (i) conserve and protect biodiversity and natural processes;
- (ii) provide opportunities for recreation and education associated with the enjoyment and understanding of natural environments, where consistent with (i);
- (iii) to provide for other uses, at sustainable levels, as determined below;

that the following activities be permitted:

- (iv) recreational and commercial fishing as determined by the manager through a management planning process which addresses protection of park values, enjoyment of the park and appreciation of the natural environment;
- (v) traditional fishing, hunting, gathering and ceremonial activities by Aboriginal people;
- (vi) research, subject to permit;
- (vii) marine aquaculture, subject to an environmental assessment which is to include public consultation;
- (viii) seabed cables and pipelines, subject to an environmental assessment which includes public consultation;

that following activities not be permitted:

- (ix) oil and gas extraction;
- (x) exploration and extraction of minerals and stone;
- (xi) uses that may disturb the seabed or biota;

that:

- (xii) the parks be permanently reserved under new or amended legislation and be managed by the Department of Natural Resources and Environment;
- (xiii) a management plan be finalised for each park by the manager after public consultation and in consultation with fisheries managers, outlining the strategies to be taken to achieve the objectives of the park, and be in place within two years of the Government's acceptance of these recommendations.

Full descriptions and maps of the recommended Marine Conservation Parks are not provided as they are existing parks with the exception of changes to C1 and C4.

- C1** Bunurong Marine Conservation Park (see also Recommendation A8)
- C2** Shallow Inlet Marine Conservation Park*
- C3** Wilsons Promontory Marine Conservation Park
- C4** Corner Inlet Marine Conservation Park* (see also Recommendation B10)
- C5** Nooramunga Marine Conservation Park*

*also includes coastal (ie land) portions of existing marine and coastal parks



Recommended Marine Special Management Areas

Marine Special Management Areas are recommended in order to ensure that areas of special value are identified and that they are managed appropriately.

The areas recommended as Marine Special Management Areas have a range of special values, including:

- breeding, nursery and haul-out areas for marine mammals such as seals and whales;
- breeding and roosting areas for seabirds and shorebirds;
- areas of special value for recreational or commercial fisheries, such as nursery areas;
- intertidal and shallow subtidal areas with a high diversity of marine invertebrates; and
- areas of special biological, geomorphological or palaeontological value.

In certain instances the boundary of an area has been left undefined due to the spatially dynamic nature of the special value, eg seagrass beds or whale calving areas.

Each site has different management requirements, and many areas have management regimes already in place that address potential threats and incorporate specific measures to protect the identified values.

Recommendation

D The recommended areas shown on Map A (numbered D1 to D15), be used to:

- (i) protect the identified special values for the site;
- (ii) unless otherwise specified, provide for recreational and commercial fishing activities, passive recreation, education and scientific study, to be carried out in ways that minimally affect the area and the particular values requiring protection;

and that:

- (iii) each Marine Special Management Area be subject to a management plan which identifies specific measures for protection of the special value or values. Such management plans may be prepared as part of another planning process, such as Coastal Action Plans, Park Management Plans or Fisheries Management Plans;
- (iv) mineral, stone, oil and gas exploration or extraction be permitted subject to an environmental assessment being undertaken and considered by the Minister responsible for the area.



Full descriptions and maps of the recommended Marine Special Management Areas can be found in Parts Three to Five.

- D1** Cape Bridgewater Marine Special Management Area (see page 70)
- D2** Lawrence Rocks Marine Special Management Area (see page 70)
- D3** Portland Bay Marine Special Management Area (see page 71)
- D4** Lady Julia Percy Island (Deen Maar) Marine Special Management Area (see page 71)
- D5** Logans Beach Marine Special Management Area (see page 72)
- D6** Dinosaur Cove Marine Special Management Area (see page 72)
- D7** Clifton Springs Marine Special Management Area (see page 80)
- D8** Capel Sound Marine Special Management Area (see page 80)
- D9** Honeysuckle Reef Marine Special Management (see page 88)
- D10** Crawfish Rock Marine Special Management Area (see page 88)
- D11** Observation Point (Rhyll) Marine Special Management Area (see page 89)
- D12** San Remo Marine Special Management Area (see page 89)
- D13** Bass River Delta Marine Special Management Area (see page 90)
- D14** Seal Rocks (Phillip Island) Marine Special Management Area (see page 108)
- D15** The Skerries Marine Special Management Area (see page 108)

Recommended Biosphere Reserves

Biosphere Reserves are an initiative of the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and are internationally recognised within the statutory framework of UNESCO's Program on Man and the Biosphere. The aim of the program is to help reconcile conservation of biodiversity with sustainable use. Their effectiveness is dependent on management authorities and local communities working closely together to achieve this outcome. Since the launch of the program in the 1960s, 324 reserves have been designated in 82 countries, 12 of them in Australia (two in Victoria).

Western Port is an area of great environmental significance and its marine ecosystems are widely

recognised as having regional, national and international significance. Because of the unique tidal characteristics that exist in Western Port, and the vulnerability of its habitats and associated biota, damage at one site may have widespread impacts in other parts of the bay. The biological sensitivity of Western Port requires integrated management of its catchments, water quality and natural resources. A Biosphere Reserve may facilitate such an integration of effort. Western Port has been identified as a potential area for inclusion in the Biosphere Program, in the French Island National Park Management Plan. There is also some community support for the proposal. The values of Western Port have also been recognised in its listing as an internationally significant wetland under the Ramsar convention.

Recommendation

- R25** The Government investigate the establishment of a Biosphere Reserve incorporating French Island, Phillip Island and the surrounding waters of Western Port.



7. Marine aquaculture areas

The ECC's Term of Reference require it to investigate and make recommendations on areas suitable for marine aquaculture, which can be developed on an environmentally sustainable basis. Marine aquaculture has the potential to contribute substantially to the Victorian economy.

The ECC's draft recommendations have focused on achieving a balance between providing access for aquaculture and minimising the impact on environmental values.

7.1 Victoria's aquaculture initiatives and ECC's role

Marine aquaculture has major potential for growth within Victoria, and the industry and Government are keen to facilitate its development. To support recent initiatives aimed at the development and growth of the aquaculture industry, the ECC has been requested to identify areas suitable for farming of marine species. Since these terms of reference were given to the ECC in 1997, two major reports on aquaculture have been completed. The Victorian Aquaculture Strategy was released in late 1998, and the Final Report of the Aquaculture Regulatory Reform Task Force was released in mid 1999.

The Victorian Aquaculture Strategy (1998) provides the framework to develop a profitable, diverse, ecologically sustainable and well managed aquaculture industry.

One of the key areas for action under the Victorian Aquaculture Strategy is to ensure a supportive legislative, policy and administrative framework within which industry can be facilitated. The Aquaculture Regulatory Reform Task Force has made a number of recommendations which were accepted by Government. A

major factor repeatedly identified as limiting aquaculture development in Victoria is lack of access to suitable sites in marine waters.

Within the context of these major statements on aquaculture, the ECC has looked closely at potential sites or the various forms of aquaculture across Victoria's marine and coastal areas, working closely with industry, the Fisheries Co-Management Council's Aquaculture Sub-committee, and Fisheries Victoria's Aquaculture Section.

The ECC highlights the following components of the Victorian Aquaculture Strategy and the recommendations of the Aquaculture Regulatory Reform Task Force, stressing the importance of the provisions for protection of environmental values:

- Preparation of management plans for each new aquaculture area, which establishes the operational, environmental and administrative requirements, including specification of baseline and ongoing environmental monitoring requirements for management purposes (Victorian Aquaculture Strategy)
- The establishment of a one-stop shop within Fisheries Victoria to provide a single point of contact between State Government and potential aquaculture proponents (Aquaculture Regulatory Reform Task Force)
- Development of a Victorian Translocation Policy and guidelines (Aquaculture Regulatory Reform Task Force).



7.2 Categories of marine aquaculture

There are three categories of aquaculture each with specialised requirements and different impacts on the environment. See Appendix 5 for more details.

Land-based aquaculture of marine species

Land-based marine aquaculture appears to have immediate potential for economic growth. Seawater is pumped or diverted into the holding structures and subsequently discharged to sea, recirculated or utilised elsewhere. This form of aquaculture is relatively free of many of the technical problems which beset marine-based operations. The advantages and disadvantages of land-based aquaculture were outlined in the Interim Report published in February 1998. Compared with the criteria for marine-based aquaculture, the criteria for land-based proposals are simpler. Key criteria include salinity of water source, contaminants, water temperature, water quality, water intake site, and waste discharge.

Extensive marine aquaculture (generally shellfish)

While this form of aquaculture, where growth is dependent on naturally available food in the water column, requires larger areas for lease, it is a relatively non-intensive use. If sited so as not to interfere with other water users, most issues can be resolved. Supplementary feeding is not usually required.

Intensive marine aquaculture (generally finfish)

Cultivation is undertaken in controlled conditions and growth is promoted by the addition of food supplements. While the areas required for raising finfish at sea are not large, the use of supplementary feeding can have a significant impact in waters where there is inadequate water movement and exchange.

7.3 Nutrient management and finfish culture in Port Phillip Bay

Risks associated with an increase in nutrient inputs were pointed out in the 1996 CSIRO study of Port Phillip Bay. It is Victorian Government policy to reduce nitrogen inputs to Port Phillip Bay by 1000 tonnes per annum (approximately 15%) by 2006. Because finfish farming in the bay would require supplementary feeding (which would result in increased nitrogen input), the establishment of any proposed farms would need to be done with caution.

Recommendation

R26 Commercial finfish aquaculture should only be considered in Port Phillip Bay following preliminary trials conducted under the following conditions:

- the trials are undertaken according to nutrient risk management as outlined in Schedule F6 (Waters of Port Phillip Bay) of the State Environment Protection Policy (Waters of Victoria);
- a detailed monitoring program is carried out and supervised by Fisheries Victoria;
- the trial demonstrates that a commercial operation can be carried out with no net additional local nutrient input to Port Phillip Bay (note that this could possibly be achieved, for example, by having a corresponding filter-feeding shellfish operation which would remove nutrients); and
- a mechanism is developed, and put in place, to ensure the monitoring of the ongoing net nutrient balance of commercial finfish aquaculture operations in the Bay.

Commercial operations should only be approved by the Department of Natural Resources and Environment after advising the Minister responsible for Fisheries and the Minister for Environment and Conservation, that the nutrient management program is in line with the Government policy to reduce nitrogen input to the Bay and that the above conditions have been met.



7.4 ECC's response to major issues related to marine aquaculture

Throughout the investigation, the ECC has carefully considered all submissions and views expressed during consultations. The following section summarises the major issues raised in relation to marine aquaculture and Council's response to these issues.

Establishment of marine aquaculture zones

Many submissions were received following the release of the Interim Report (1998) on broad issues relating to marine aquaculture. Some viewed aquaculture as a mechanism for reducing pressure on natural fish stocks while conferring economic benefits on operators and the wider community. A number of submissions supported the selection criteria and principles as long as conservation principles were upheld in the planning process, but others felt that the ECC

investigation was impeding the development of Victoria's aquaculture industry. There were calls for tighter controls on offshore aquaculture operations with many submissions supporting land-based operations that were viewed as less likely to impact on the marine environment.

It is noteworthy that marine aquaculture, after recreational fishing and social and economic issues, was the subject that generated the highest number of responses to the former LCC's Draft Final Recommendations (1996).

Response

Aquaculture has the potential to provide a wide range of benefits to the community. The development of a strong and healthy aquaculture industry is strongly supported by Council. As open water aquaculture is reliant upon the health of the surrounding environment, it is in industry's interest to ensure that they and others adhere to strict environmental guidelines. Land-based aquaculture is also strongly supported. Aquaculture development should generally not be permitted in or adjacent to sites with significant environmental values, including sensitive or threatened habitats or fragile areas.

It is a matter of some concern to the ECC that this investigation has sometimes been portrayed as an impediment to aquaculture development. In fact, the establishment of new aquaculture enterprises has been very slow in Victoria, and the ECC investigation is part of the process of facilitating marine aquaculture through nominating suitable sites. There is no doubt that delays in finalising the investigation have caused some frustration, but it is important to note that aquaculture proposals can be, and are, being dealt with under the existing guidelines prior to the Government's consideration of, and response to, the final Council recommendations.



Economic issues

Economic issues raised during consultation and in submissions include the benefits to local communities of aquaculture operations, the impacts on tourism, and price impacts on wild

fisheries. Concerns have been expressed that there may be a negative impact on tourism because of the visual intrusion of aquaculture farms.

Response

There can be significant benefits to local economies associated with aquaculture including the attraction of investment capital, direct employment, development of support services and multiplier effects, especially in regional Victoria.

Tourism and local marketing opportunities also exist for aquaculture operations. Educational and information tours are run on a regular basis in aquaculture areas in other states. Submerged technologies are now available that, along with careful site selection, reduce the visual impact of aquaculture farms. (Also see Environmental issues on page 50.)

In relation to concerns expressed about potential price impacts, it is unlikely that there will be negative impacts on prices for the wild fishery as a result of marine aquaculture. This is because aquaculture generally targets niche markets, and concentrates on consistency of quality and regular supply to sectors such as the restaurant and export trade. The farmed product is generally more expensive than wild caught product and does not usually compete on a price basis. In fact there is an opportunity for commercial fishers to add value to wild caught stock, and to expand their business through aquaculture via holding and grow-out operations. In addition, there is a current and projected worldwide shortfall in marine production which makes it unlikely that prices will fall.



Environmental issues

A number of environmental issues related to aquaculture have been repeatedly raised throughout the investigation. Concerns were expressed about:

- the potential for introduction of diseases,
- transport of exotic animals and plants,
- impacts on marine communities beneath aquaculture farms,
- predator interactions with fish farms,

- increased nutrients, and
- the visual impact of aquaculture operations.

Many submissions were opposed to the use of exotic species on land or open water. A potential environmental benefit that was often raised during consultation was that aquaculture would reduce pressure on wild fisheries, for example, on the declining wild snapper fishery.

Response

There are several ways in which these issues are proposed to be addressed.

The Victorian Aquaculture Strategy (1998) outlines monitoring procedures to be followed for aquaculture operations including baseline studies. With effective monitoring and appropriate management, including fallowing, the impact on flora and fauna beneath aquaculture farm, while it could be significant in the short term, should be negligible in the longer term.

Prevention of introduced diseases will be addressed in AQUAPLAN, which is being developed by government and the aquaculture industry. The translocation of exotic animals and plants and non-indigenous stock, for example from Port Phillip Bay to Western Port, is being addressed by protocols currently being developed by Fisheries Victoria. The Marine and Freshwater Resources Institute is currently assessing effective treatment of mussel spat ropes to rid them of fouling organisms and exotic species.

Predator interactions with finfish farms are of two kinds: (a) predator entanglement in nets; and (b) fish stock losses through stress due to the proximity of predators, predator entry to the stock enclosure, or stock escapes through damaged nets. Potential predators in Victoria are sharks, Australian fur seals and dolphins. Heavy gauge predator nets surrounding fish pens are used in other states to prevent predator attacks, and advice to the ECC indicates that these systems are effective. The Marine Animal Interaction Working Group has developed reporting procedures for cases of predator attacks and entanglement. Advice from Fisheries Victoria and industry is that problems related to predator entry to, or entanglement with, finfish farms are now virtually non-existent due to upgraded enclosure systems.

Victoria's Environment Protection Authority has developed State Environment Protection Policies for Victorian Waters which specify levels for nutrient inputs into marine waters, such as nitrogenous inputs to Port Phillip Bay.

Fisheries management plans for aquaculture zones will address the issue of visual impact, but experience in other states indicates that with appropriate site selection visual impacts are generally minor. This has been demonstrated even in highly scenic environments such as the Derwent estuary in Tasmania.



Planning issues

Many planning and procedural issues have been raised in relation to preferred areas for marine aquaculture. Siting of preferred aquaculture zones, whether or not aquaculture should be permitted in marine parks, and potential conflicts with recreational boating, and commercial and

recreational fishing, are some of the frequently raised points. Victoria has a high energy coastline and was considered by some to be generally less suitable for marine aquaculture than other states such as Tasmania with its many protected embayments.

Response

The proposed preferred aquaculture zones were developed with the input of industry, Fisheries Victoria and community groups. The recommended areas are those that best meet the needs of all groups. New technologies exist for open ocean sites which offer potential for Victoria. However investors need to develop confidence with this technology, and sheltered sites such as those in Port Phillip Bay and Western Port are considered to be necessary. Sheltered sites are also required to hold stock prior to going to market and spat prior to being moved.

Aquaculture will not be allowed in the fully protected Marine National Parks or Marine Sanctuaries. Aquaculture may be permitted in Marine Conservation Parks provided it is compatible with the objectives for the particular park, and subject to appropriate environmental impact assessment.

Recreational boating and fishing will be allowed in aquaculture zones provided that the aquaculture operation is not adversely affected. Commercial fishers are unlikely to be significantly affected by the proposed aquaculture zones. Consultation with the responsible navigation authorities has determined the level of risk to commercial shipping and recreational vessels to be low provided aquaculture operations are marked clearly and notice is given to mariners.



7.4 Principles for selection and management of marine aquaculture areas

The Terms of Reference for this investigation required the Council to make recommendations on areas suitable for marine aquaculture, which can be developed on an environmentally sustainable basis.

In the Interim Report (1998), comment was sought on principles and criteria which were established for the selection and management of both marine and land-based aquaculture sites. This input built on that provided earlier in response to the LCC Draft Final Recommendations (1996).

As outlined in the Interim Report, the Council has adopted the following principles for the selection and management of marine aquaculture areas.

- ❑ Aquaculture at each of the chosen sites must be able to demonstrate and deliver a significant socio-economic gain to the Victorian community.
- ❑ Aquaculture should not be practised on or immediately adjacent to sites with significant environmental values.
- ❑ Aquaculture should not impose permanent ecological change to the site where it is located or to the ecosystem of which it is a part.
- ❑ Conflict with other uses or values should be avoided wherever possible.

Technical criteria for marine aquaculture have been identified and revised through consultation with Fisheries Victoria, and are outlined in Appendix 5. Criteria include physical site details such as water depth and sediment characteristics, water movement and exchange, access and serviceability, and water quality.

7.5 The proposed areas

Two types of aquaculture areas are recommended in this draft report:

Aquaculture Zone – an area that has demonstrated successful aquaculture performance or growth of target species in the past or, on advice from Fisheries Victoria and industry, will almost certainly be suitable for target species.

Zones have been chosen in areas where conflict with other uses is minimised, but Council would welcome comments on alternative sites or possible conflicting uses that may have been overlooked.

Aquaculture Investigation Area – a larger area than an aquaculture zone that has shown evidence of aquaculture potential through growth of wild or cultured product, but requires further evaluation. If a resulting aquaculture zone were proposed, it would in most cases be a similar size to the existing aquaculture zone proposals, ie approximately 200 ha.

Aquaculture operations only use part of their lease area, for finfish this is approximately 5%, and for shellfish approximately 33%. This relatively low intensity of use reduces the risk of disease, allows for access between farmed areas and allows for fallowing of sites.

Eight aquaculture zones and seven aquaculture investigation areas are recommended. Each of the areas is described fully in the following section.



Aquaculture proposals outside the recommended areas

The selection of the proposed aquaculture zones and aquaculture investigation areas was based on input from industry, Fisheries Victoria, the community and other relevant bodies such as port authorities. However as aquaculture is a rapidly developing industry, with offshore technology in particular undergoing rapid technological improvements, other areas may be suitable to meet future needs and requirements for marine aquaculture.

In addition some forms of marine aquaculture have only very general site requirements, eg abalone growout, and nomination of particular

sites for these activities is unlikely to be of much assistance to industry.

For these reasons it is important that there be a mechanism to consider aquaculture development outside areas specifically recommended in this report. The Aquaculture Development Committee is the appropriate body for this and will ensure that such proposals are considered through the usual planning processes, and that there is an integrated public consultation process for all proposals. The role and workings of the Aquaculture Development Committee are covered in more detail in the Victorian Aquaculture Strategy (pages 18 and 24). The principles outlined on page 52 should guide this Committee.



Recommended Aquaculture Zones

The ECC recommends the following eight Aquaculture Zones in areas that have demonstrated successful aquaculture performance or growth of target species in the past or, on advice from Fisheries Victoria and industry, will almost certainly be suitable for target species.

It is expected that Aquaculture Zones approved by Government will be established as Fisheries Reserves under s 88(2)(iii) of the *Fisheries Act* 1995 and a management plan prepared for each area, prior to the sites within the zone being leased. The Victorian Aquaculture Strategy broadly outlines the process for commercial development of the Aquaculture Zones.

The recommended areas shown on Map A (numbered E1 to E8) be made available for marine aquaculture subject to:

- (i) preparation of a management plan for each area, including specification of baseline and ongoing environmental monitoring requirements, access to the zone by other users; and
- (ii) any additional requirements for individual areas noted in recommendations E1 to E10 below.

Recommended Aquaculture Investigation Areas

The recommended areas shown on Map A (numbered F1 to F7) be made available for further investigation as to suitability for marine aquaculture.

Note: Investigations are under way in some of these areas, and sufficient information may be available prior to completion of the final report to identify more defined aquaculture zones within these much larger areas.

Investigation could include experimental production, with data from the experimental phase being assess to determine potential aquaculture zones.

Full descriptions and maps of recommended Aquaculture Zones and Aquaculture Investigation Areas can be found in Part Six (see pages 112 –119).

E1	Grassy Point Aquaculture Zone	F1	Portland Aquaculture Investigation Area
E2	Clifton Springs Aquaculture Zone	F2	Pt Lillias Aquaculture Investigation Area (land based)
E3	Bates Point Aquaculture Zone	F3	Kirk Point – Werribee River Aquaculture Investigation Area
E4	Beaumaris Aquaculture Zone	F4	Corinella Aquaculture Investigation Area
E5	Mount Martha Aquaculture Zone	F5	Bass River Aquaculture Investigation Area
E6	Dromana Aquaculture Zone	F6	Anderson Inlet Aquaculture Investigation Area
E7	Flinders Aquaculture Zone	F7	Corner Inlet Aquaculture Investigation Area
E8	Waratah Bay Aquaculture Zone		



Recommendations for Western Victoria
- Marine Protected Areas

Western Victoria

This part sets out the recommendations for marine protected areas for the area from the South Australian border to Point Lonsdale at Port Phillip Heads.

The marine environment along this coastline encompasses the deep colder waters of the Southern Ocean to the west and shallower Bass Strait waters off central Victoria. The coastline includes the remote dune systems of the Discovery Bay area near Portland, spectacular limestone formations of the Port Campbell area, and the heavily visited rocky shore and surf coast environments along the Great Ocean Road between Point Lonsdale and Apollo Bay.

Main regional centres include Portland, Warrnambool, Lorne, Torquay and Ocean Grove. Agriculture, tourism and fishing are major economic activities. Portland, as the only deepwater port between Port Phillip Bay and Adelaide, is important for shipping. Coastal towns such as Torquay also act as dormitory suburbs for people working in the nearby city of Geelong.

This part of the report gives descriptions of the recommended Marine National Parks, Marine Sanctuaries and Marine Special Management Areas in western Victoria listed below.

See Part Two of this report for an overview of the recommendations for marine protected areas including recommendations for permitted uses and activities.

Recommended Areas

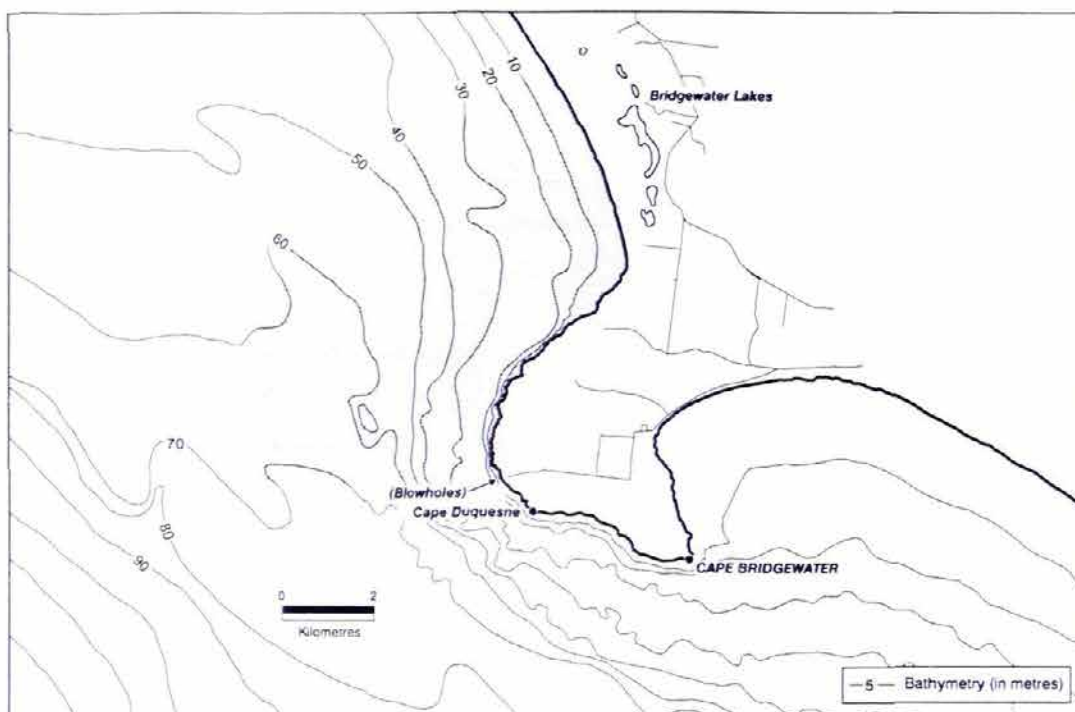
- A1** Discovery Bay Marine National Park
- A2** Twelve Apostles Marine National Park
- A3** Point Addis Marine National Park

- B1** Merri River Mouth Marine Sanctuary
- B2** The Arches Marine Sanctuary
- B3** Marengo Reefs Marine Sanctuary
- B4** Eagle Rock Marine Sanctuary
- B5** Point Danger Marine Sanctuary
- B6** Barwon Bluff Marine Sanctuary

- D1** Cape Bridgewater Marine Special Management Area
- D2** Lawrence Rocks Marine Special Management Area
- D3** Portland Bay Marine Special Management Area
- D4** Lady Julia Percy Island (Deen Maar) Marine Special Management Area
- D5** Logans Beach Marine Special Management Area
- D6** Dinosaur Cove Marine Special Management Area



A1 DISCOVERY BAY MARINE NATIONAL PARK



This recommended park in the far west of the State adjoins some of Victoria's most wild and remote coastline, fully exposed to the prevailing westerly seas and weather.

Location

- Located about 20 km west of Portland, and adjacent to Discovery Bay Coastal Park.
- Extends along approximately 11 km of coastline north of the Blowholes at Cape Duquesne to 1.5 km north-west of Bridgewater Lakes, and offshore for 3 nautical miles to the limit of Victorian waters.
- Approximately 4 900 hectares.

Representation

- One of two Marine National Parks, with Twelve Apostles, proposed for the Western biophysical region of Victoria (IMCRA Otway Region).
- The following habitats are represented in the park: sandy beaches, intertidal and sub-tidal rocky reefs, sub-tidal soft sediments.
- The rocky habitats of this area have complex forms, including low profile calcarenite platforms with gutters and sunken pits, isolated flat low calcarenite reefs, extending one metre above the sand surface, shell grit, calcarenite rubble, gravel, and heavy, sloping, 2–3 m high basalt walls with small round boulders embedded at their base.
- Sub-tidal soft sediments consist of predominantly fine sand with some coarse to very coarse sand, with a carbonate content of around 80%.

(More general information on representation can be found in Part Two, sections 6.3 and 6.6 of this report.)

Environmental significance

- The proposed park is part of the largest coastal basalt formation in Western Victoria and is amongst the highest wave energy environments in the State.
- Calcarenite reefs with thick growths of sessile invertebrates between 33 and 55 metres depth. These encrusting communities contain many species of sponges, ascidian, bryozoa and gorgonians.
- Basaltic reefs at 18 metres depth covered by kelps including the large brown kelp *Ecklonia radiata*.
- High diversity of intertidal and shallow sub-tidal invertebrates, including rock lobster and abalone.
- Blue whales and white pointers are regular visitors to the area.
- Adjoining coastline with geomorphologically significant basaltic sea caves, and significant sites for a number of flora and fauna species, including a largely unvegetated extensive dune system with dune lakes that support wetland vegetation.



Implications for users

Recreation and tourism

- Whites Beach in Descartes Bay and Blacks Beach further north are the only locations within the proposed park that are readily accessible. They are used for shore-based fishing and Whites Beach is also used for shore-based diving.
- The impact of the recommended park on recreational fishing is considered to be relatively minor, as the current level of use is low, and there are other more accessible alternative sites in the general area.
- There will be no restrictions on boating, diving, and other non-harvesting activities. In the longer term, these forms of recreation may be enhanced and developed to complement promotion of the Discovery Bay Coastal Park as a major tourist resource. Visitors to the adjacent Great South West Walk and other attractions such as the Blowholes provide potential for combined marine and land based interpretation programs.

Commercial fishing

- The major commercial activities, abalone and rock lobster harvesting, were valued in 1996/97 at \$433 000 (or 5.1% of the 1996/97 Western Zone catch) and \$382 000 (or 3.4% of the 1996/97 Western Zone catch) respectively. Other fishing activities amounted, in 1996/97, to about \$10 000. The estimated total value of commercial fishing in 1996/97 is \$825 000. Estimates of the value of commercial fishing are from MAFRI (1999a).
- An alternative proposal for a marine national park at White's Beach was developed by commercial fishers based in Portland, following informal consultation about a park at Cape Nelson that was under consideration. The ECC assessed the proposal, which forms the basis of the current recommendation. The assessment of the area, which included a field survey, was that the proposal, as originally suggested, did not comprehensively sample the range of marine habitats, but that an additional area to the south would greatly improve the viability and representativeness of the park.

Consideration of alternative areas

- Other nearby areas that have been considered previously include Cape Nelson and Lady Julia Percy Island, but input from consultation indicated that they were less acceptable on balance due to the impacts on users.

Management and compliance issues

- The proposed park is not readily accessible and is remote from vehicle access.

Assessing effectiveness

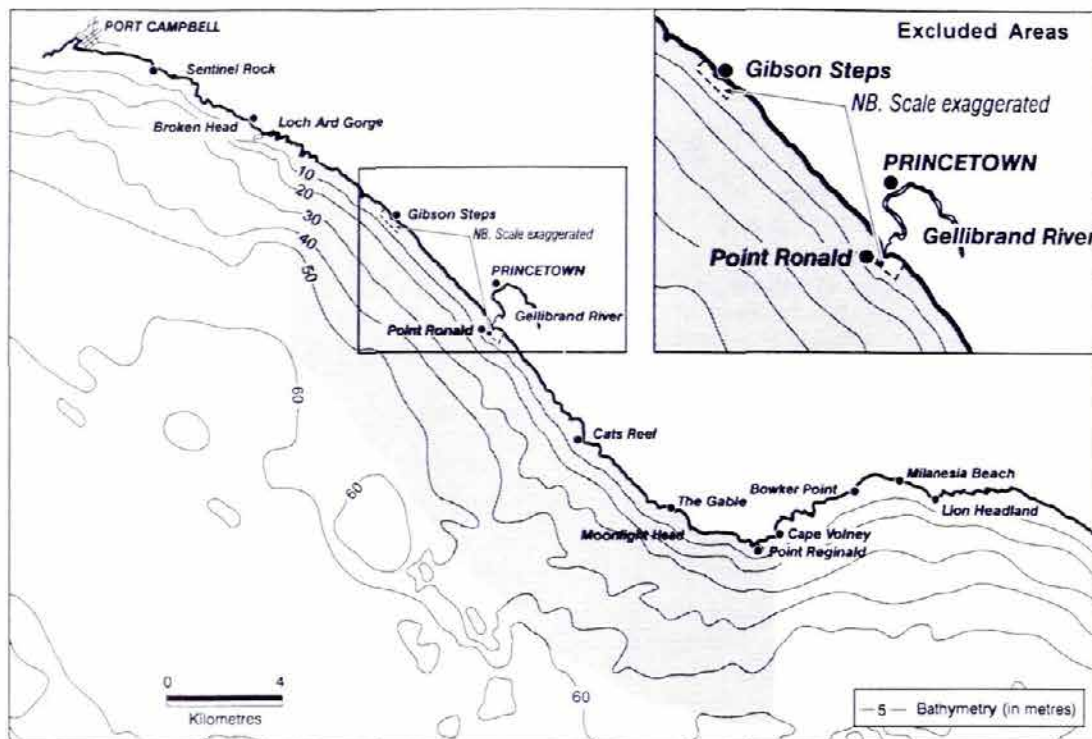
- Monitoring and assessment of the effectiveness of the park will be assisted by comparison with similar areas where activities such as fishing take place. Areas which could be included in a monitoring program are Discovery Bay north of the park, Cape Duquesne to Cape Bridgewater, and Cape Nelson.

INFORMATION SOURCES

From all information used for this area, including extensive consultation, the following reference numbers contain site-specific data: 17, 18, 22, 27, 28, and 29.



A2 TWELVE APOSTLES MARINE NATIONAL PARK



Twelve Apostles, along with Wilsons Promontory, is one of two major new Marine National Parks recommended for Victorian waters. The park includes spectacular underwater scenery that is a continuation of the famous coastal limestone cliffs and stacks of the Port Campbell area.

Location

- Located about 7 km east of Port Campbell, and adjacent to Port Campbell and Otway National Parks.
- Extends along approximately 23 km of coastline from east of Broken Head to Cape Volney, and offshore for 3 nautical miles to the limit of Victorian waters.
- Approximately 12 230 hectares.

Representation

- One of two Marine National Parks, with Discovery Bay, proposed for the Western biophysical region of Victoria (IMCRA Otway Region).
- One of two large Marine National Parks proposed for Victoria.
- The following habitat types are represented in the park: intertidal and sub-tidal rocky reefs, sandy beaches and sub-tidal soft sediments.
- The rocky habitats of this area are complex in form and include platforms with shallow (< 1m) fissures and gutters; small rounded boulders; and heavy reef with sharp, steeply sloping ridges > 2m in height, some with narrow crevasses, others with wide sand filled gutters.

- Sub-tidal soft sediments consist of predominantly fine sand with some medium and coarse sand, and coarse shell rubble, with a carbonate content from 45 to 90%.

(More general information on representation can be found in Part Two, sections 6.3 and 6.6 of this report.)

Environmental significance

- The underwater extension of the well-known and spectacular terrestrial limestone cliffs, including dramatic underwater arches and canyons with marine life that is striking in colour and shape.
- Characteristic of a larger area from Childers Cove (east of Warrnambool) to Gibson Steps which has the highest diversity of intertidal and shallow subtidal invertebrates on limestone in Victoria.
- The sandstone intertidal rocky platforms around Moonlight Head are extensive and contain a range of coastal orientations and microhabitats. These platforms are characterised by rich intertidal and shallow subtidal invertebrate communities (eg Cats Reef).
- Imposing, deep (16 to 55 m) sloping reefs occur 4 to 5 kilometres offshore from Moonlight Head.



- The proposed park contains various geological rock types, including limestone, calcarenite, mudstone and sandstone, adding to the total substrate complexity of the area.
- Shoreline, rock stacks and islands provide breeding colonies for seabirds.
- Adjacent coastline has sites of significance for flora and fauna, and sites of geological and geomorphological significance including karst (ie cave) topography.

Implications for users

Recreation and tourism

- The area is growing in popularity for diving, cliff top sightseeing, nature study, pleasure cruises, and limited shore and boat-based fishing. Although recreational fishing is limited by the generally difficult boat and land access, a few locations are accessible and popular for recreational fishing.
- The impact of the recommended park on recreational fishing will be small, as most of the park is relatively inaccessible. Two areas that are readily accessible and particularly popular for recreational beach fishing, Gellibrand River mouth at Princetown and Gibson Steps, are not included in the park.
- There will be no restrictions on boating, diving, and other non-harvesting activities. The recommended park is adjacent to the Otway and Port Campbell National Parks, providing opportunities to develop complementary visitor information and education materials.

Commercial fishing

- For an area approximately 15% larger than the recommended park, the two major commercial activities, abalone and rock lobster harvesting, are valued, in 1996/97, at \$684 000 (or 3.3% of the 1996/97 Central Zone catch) and \$361 000 (or 3% of the 1996/97 Western Zone catch) respectively. Other fishing activities amounted, in 1996/97, to about \$39 000. The estimated total value of commercial fishing in 1996/97 for the larger area is \$1 084 000. Estimates of value of commercial fishing are from MAFRI (1999a).

- To reduce the impact on commercial fishing, the park no longer includes fishing grounds close to the township of Port Campbell.

Petroleum exploration and extraction

- Oil and gas exploration that does not disturb the seabed and biota will be allowed, but exploratory drilling and extraction will not be permitted in marine national parks.
- Oil and gas pipelines will be allowed subject to an Environment Effects Statement process, as for terrestrial national parks.

Consideration of alternative areas

- Other nearby areas that have been considered previously include areas around or near Lake Gilleard, Glenaire, and areas closer to Port Campbell.

Management and compliance issues

- Parts of the proposed park are readily accessible from the shore through the extensive road network associated with Port Campbell National Park. Other areas are more remote and difficult to access. Boat access to most of the proposed park is difficult.
- The increased number of visitors to Port Campbell National Park, is likely to increase visitor numbers to some shoreline sections of the park.

Assessing effectiveness

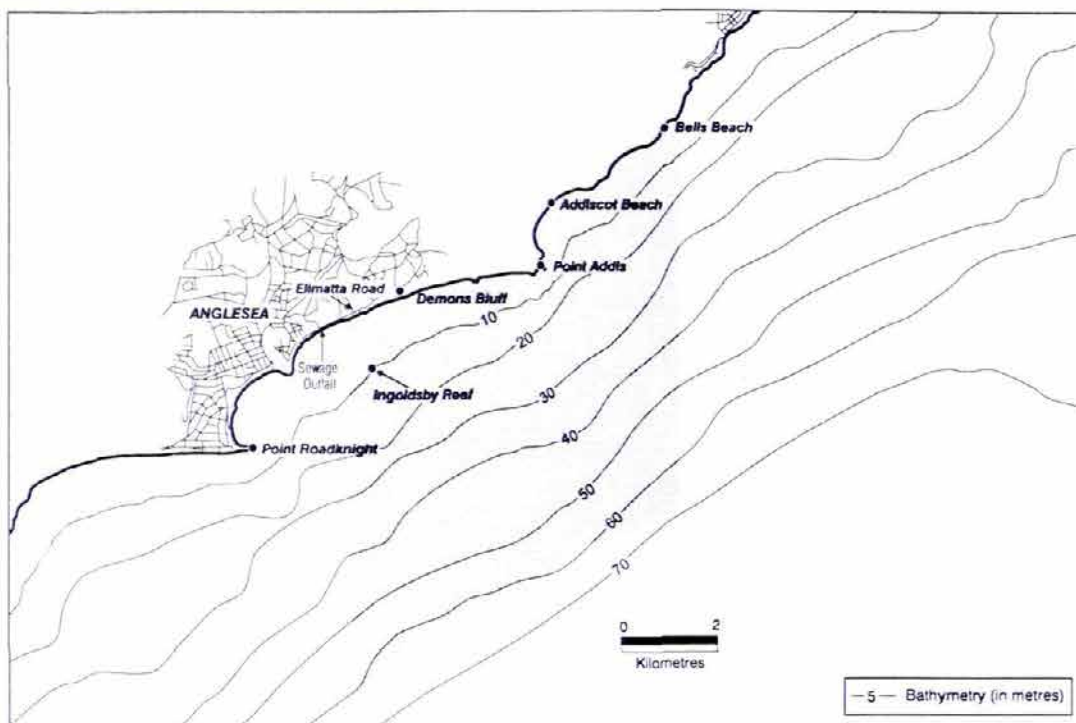
- Monitoring and assessment of the effectiveness of the park will be assisted by comparison with similar areas where activities such as fishing take place. Areas which could be included in a monitoring program are between the Bay of Islands and Port Campbell, and between Cape Volney and Cape Otway.

INFORMATION SOURCES

From all information used for this area, including extensive consultation, the following reference numbers contain site-specific data: 4, 17, 22, 27, 29, 30, 32 and 33.



A3 POINT ADDIS MARINE NATIONAL PARK



This recommended park adjoins rugged cliffs for much of its length, but also includes the world famous Bells Beach.

Location

- Extends along approximately 10 km of coastline east of Anglesea to (and including) Bells Beach, and offshore for 3 nautical miles to the limit of Victorian waters.
- Approximately 4 965 hectares in size.

Representation

- One of two Marine National Parks, with Bunurong, proposed for the Central biophysical region of Victoria (IMCRA Central Victoria Region).
- The following habitat types are represented in the park: sandy beaches, intertidal and sub-tidal rocky reefs, and sub-tidal soft sediments.
- The rocky habitats of this area have varied forms, including low profile reef about half to one metre high, low profile broken reef, and rounded cobbles.
- Sub-tidal soft sediments consist of a mixture of fine and medium sand with some coarse sand, and silt, shell and coral rubble, with a carbonate content of 75 to 90%.

(More general information on representation can be found in Part Two, sections 6.3 and 6.6 of this report.)

Environmental significance

- Areas with distinctive invertebrate communities at a depth of 40 to 50 metres, including dense invertebrate clumps of sponges, bryozoans, ascidians and hydroids.
- Ingholdsby Reef with a range of marine life, including the leafy sea-dragon.
- *Amphibolis* seagrass off Point Addis.
- Adjoining coastline with rugged cliffs and bluffs with species-rich heathlands and coastal scrub, wide sandy beach systems to the east and west of the Point Addis headland, and an extensive area of remnant vegetation known as the Iron Bark Basin, a municipal reserve.
- The Point Addis Limestone is of State geological significance.



Implications for users

Recreation and tourism

- Bells Beach is one of the world's best known surfing beaches and home to a number of major surfing competitions. There will be no restrictions on the major surf tournaments held at Bells Beach. Establishment of the recommended park could further enhance the icon status of Bells Beach, and assist in communicating environmental messages to the surfing community and general public.
- The proposed park is currently used for surf fishing, particularly between Black Rock and Point Addis, and boat-based fishing. In addition to Bells Beach, Addiscot Beach is also popular for surfing, and diving and nature study are popular at Ingoldsby Reef.
- On balance, the ECC considers that the impact of the restriction on recreational fishing is likely to be fairly low, as much of the park is not readily accessible and alternative areas are available within a reasonable distance.
- There will be no restrictions on boating, diving, and other non-harvesting activities.

Commercial fishing

- The two major commercial activities, abalone and rock lobster harvesting, are valued, in 1996/97, at \$49 000 (or 0.2% of the 1996/97 Central Zone catch), and \$52 000 (or 2.6% of the 1996/97 Eastern Zone catch) respectively. Other fishing activities include mainly mesh netting, with small quantities from other fishing methods, amounting in 1996/97, to about \$52 000. The estimated total value of commercial fishing in 1996/97 is \$153 000. Estimates of value of commercial fishing are from MAFRI (1999a).

Consideration of alternative areas

- Other nearby areas in this region that have been considered previously include the area from Anglesea to Eastern View, an area west of the recommended area to Point Impossible, and Point Nepean. There appears to be a high level of community support for a park in the proposed area.

Management and compliance issues

- The proposed park is not readily accessible, except at Bells Beach - the area with the highest visitor numbers.
- Community support for the proposal is likely to facilitate compliance.

Assessing effectiveness

- Monitoring and assessment of the effectiveness of the park will be assisted by comparison with similar areas where activities such as fishing take place. Areas which could be included in a monitoring program are from Anglesea to Eastern View, west of the proposed area to Point Impossible, and Point Nepean.

INFORMATION SOURCES

From all information used for this area, including extensive consultation, the following reference numbers contain site-specific data: **4, 17, 22, 27, 29, 30 and 31.**



Marine Sanctuaries

B1 Merri River Mouth Marine Sanctuary

This sanctuary of 48 ha at Warrnambool is recommended for its ecological significance and educational values.

The seabed of the Merri River mouth is a mixture of reef and sand with different types of seaweed, which provides a range of habitats and a particularly diverse marine life. Between Merri and Middle Islands the rocky overhangs and 8 to 10 metre deep canyons support a variety of fish life including parrotfish, blue-throated wrasse, bastard trumpeters, magpie perch and dusky and banded morwong. There are penguin colonies on both Middle and Merri Islands. Other animals include abalone, crabs and southern rock lobster which shelter in the narrow vertical crevices in reefs. Dolphins are frequent visitors to this sheltered site. The sanctuary zone is recommended across Stingray Bay to Middle Island then to Pickering Point. There are currently a variety of restrictions on commercial fishing in this sanctuary, but parts of it are used for limited abalone and rock lobster fishing, and some line fishing from the shore.

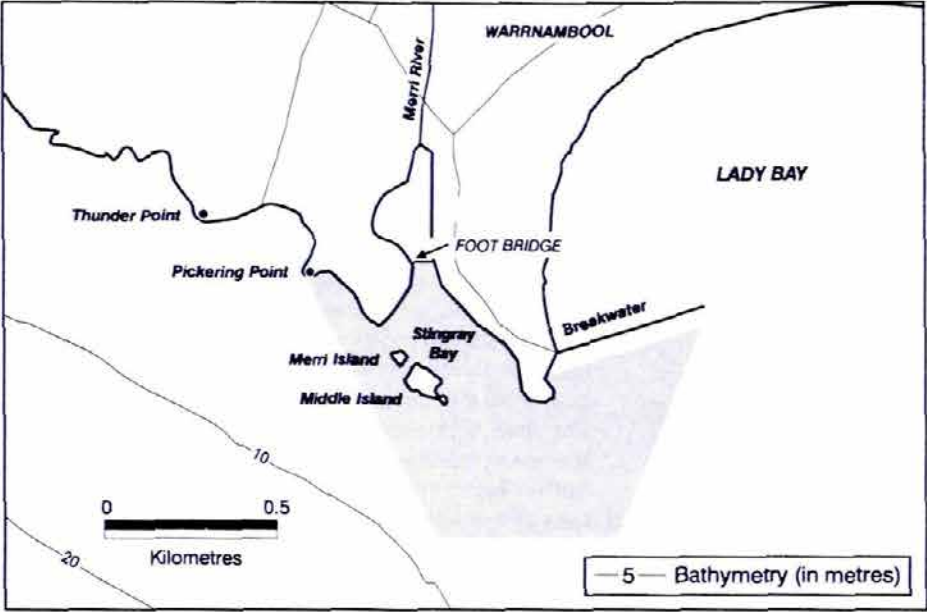
B2 The Arches Marine Sanctuary

This 46 ha sanctuary off Port Campbell is recommended for its scenic, ecological and tourism values, as it contains some of Victoria's most spectacular limestone formations with rocky arches and canyons in 19 to 25 metres of water.

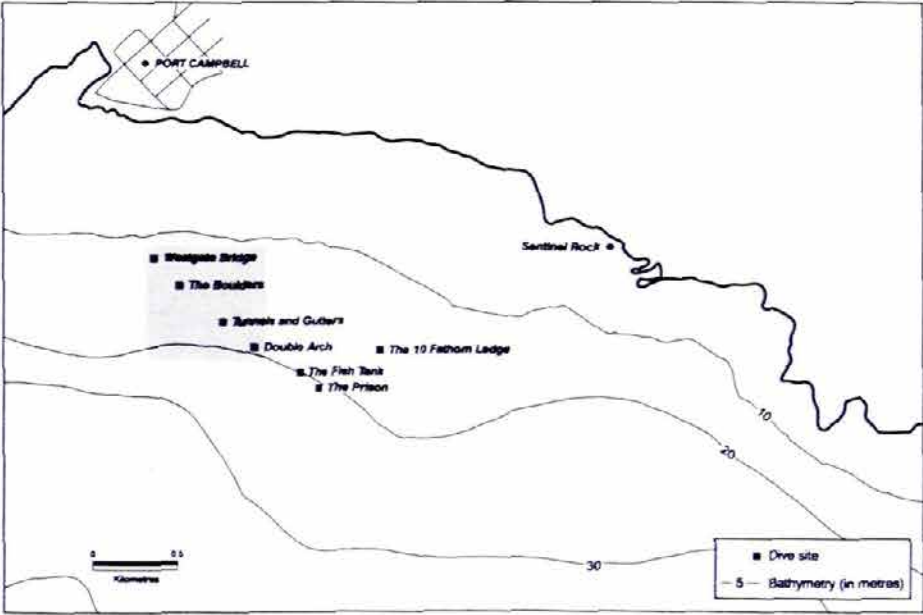
The upper surfaces of the arches are covered in kelp and an understorey of red seaweeds. The shaded undersides of arches and canyon walls are carpeted by diverse sessile invertebrates characteristic of some deeper Bass Strait waters, including sponges, bryozoans, gorgonians, hydroids and an abundance of colourful seastars. Giant kelp forests at this site provide an important habitat for a suite of marine animals such as fish, seastars and marine snails. Some rock lobster fishing currently occurs within this site. It is a popular destination for dive charter, because of the spectacular underwater scenery.



B1 Merri River Mouth Marine Sanctuary



B2 The Arches Marine Sanctuary



B3 Marengo Reefs Marine Sanctuary

These two small reefs (18 ha) at Marengo, near Apollo Bay, have major potential for education and underwater recreation as they provide excellent snorkelling opportunities close to the shore.

Due to their location and configuration, the reefs provide a wide variety of microhabitats in a very small area. The leeward side of the reefs have protected conditions unusual for the reef habitat in this high wave-energy coastline. Bull kelps and other seaweed grow densely on the reefs, with an abundance of soft corals, sponges and marine invertebrates. In suitable weather the reefs are readily accessible by boat from the harbour at Apollo Bay, or by swimming. The area proposed as a marine sanctuary follows the outer perimeter of the reefs with a 20 metre buffer. Recreational boat-based fishing is popular over the sandy bottom in the shelter of the reefs. The recommended boundary will allow this to continue. The fringes of the reefs are currently used sporadically for commercial rock lobster fishing.

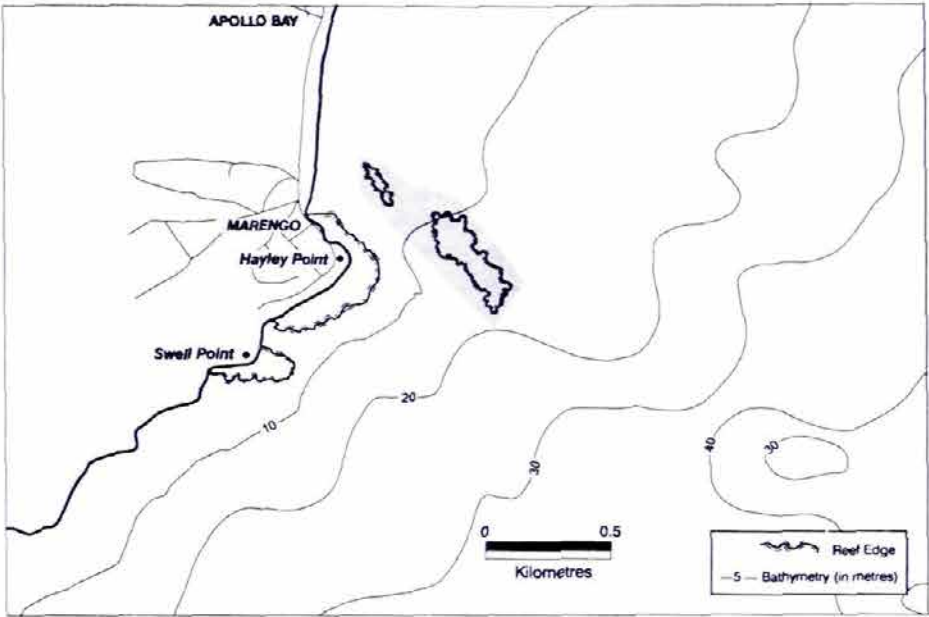
B4 Eagle Rock Marine Sanctuary

This 17 ha sanctuary at Airey's Inlet is recommended because the intertidal shore platforms and relatively shallow subtidal reefs provide excellent opportunities to observe marine life.

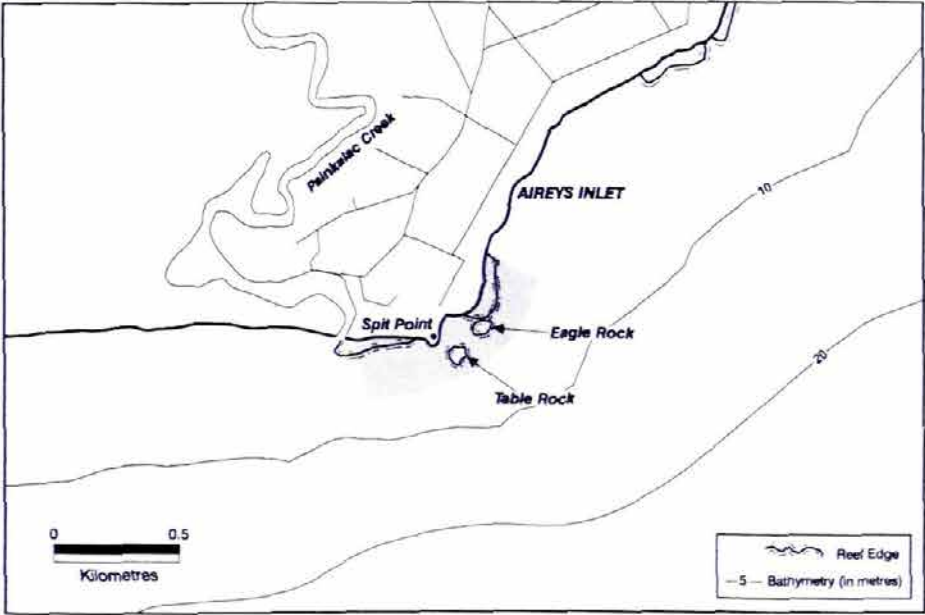
The varied geology of Eagle Rock (sandstone and basalt), with its associated range of shore platforms, pools, subtidal fissures and boulder fields, provides a variety of habitats. The diversity of invertebrates on the rock platforms remains high, despite some evidence of subtidal depletions due to harvesting. Sponges, subtidal kelp forests and an assemblage of invertebrates, including sea stars, crabs and sea anemones are found in this area. The reefs are good locations for snorkelling and diving when conditions are calm. The Eagle Rock reefs are currently used for the recreational harvest of abalone and rock lobster. The reefs of the proposed sanctuary are a small part of a larger reef complex that is currently used for the commercial harvest of abalone.



B3 Marengo Reefs Marine Sanctuary



B4 Eagle Rock Marine Sanctuary



B5 Point Danger Marine Sanctuary

This 19 ha sanctuary at Torquay is proposed for the ecological value of its intertidal area, particularly the diversity of seaslugs (opisthobranchs) at the site.

In addition to having the typically high invertebrate diversity associated with limestone substrates in Victoria, approximately 20% of the 96 species of opisthobranchs recorded from this site have not yet been scientifically described. Point Danger is visited by large numbers of people, being very popular for sightseeing and shore rambles. There is currently some recreational fishing carried out in this area for King George whiting and snapper, and a small amount of commercial fishing, mainly for abalone.

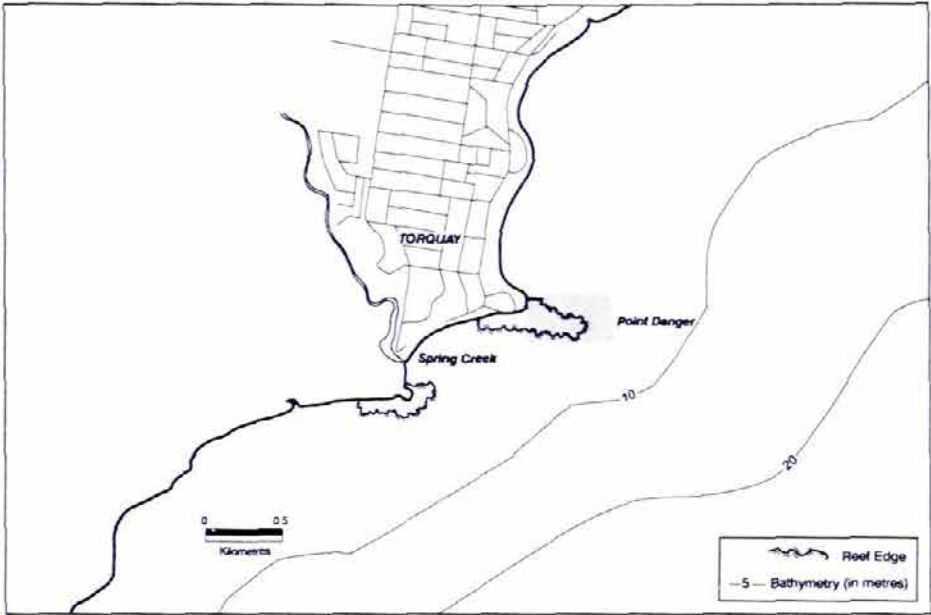
B6 Barwon Bluff Marine Sanctuary

This sanctuary of 18 ha at Barwon Heads is identified for its ready accessibility and its strong educational role.

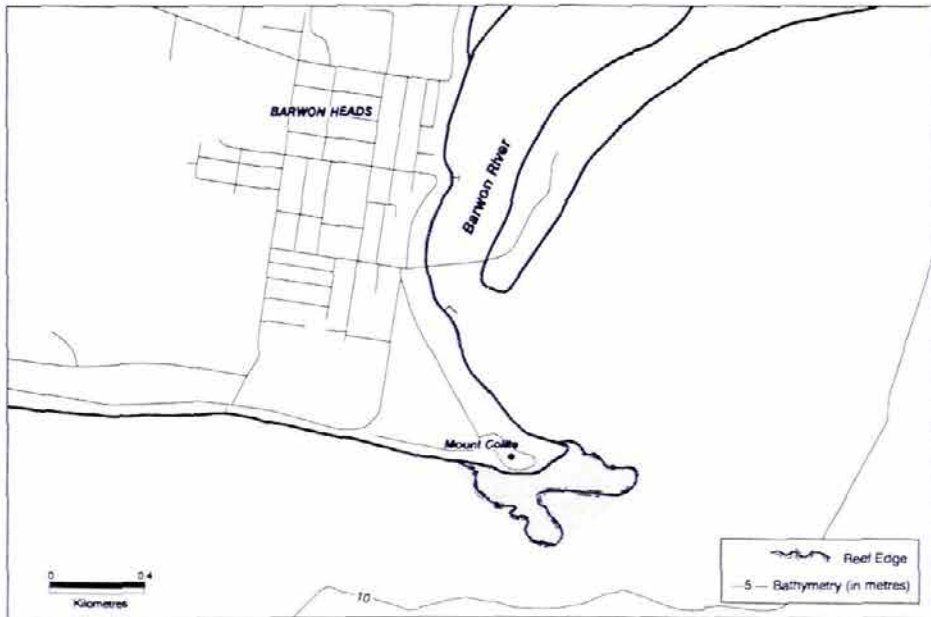
The marine life found on the shore platforms and shallow reefs around Barwon Bluff are used extensively for marine education and interpretation by many schools, universities and the Marine Discovery Centre at Queenscliff. The site is also popular for activities including swimming, rock pool rambling and snorkelling. There is spectacular snorkelling between the sandstone and basalt reefs with thick patches of giant and bull kelp. The wrecks of two ships are located on outer edges of the reef. Visitor pressure is a potential threat to this site, and must be managed to maintain the educational and natural values currently present. Abalone harvesting and recreational fishing currently take place in parts of the sanctuary.



B5 Point Danger Marine Sanctuary



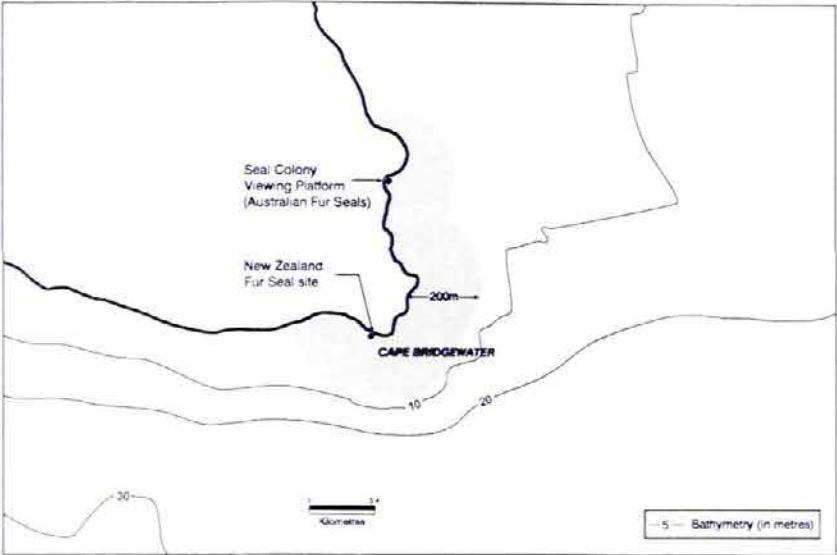
B6 Barwon Bluff Marine Sanctuary



Marine Special Management Areas

D1 Cape Bridgewater Marine Special Management Area

This 23 ha area west of Portland includes the water around one of only two mainland Australian fur seal colonies. There are reports of breeding seals that, if verified, would make it the only mainland breeding colony in Australia. A viewing platform constructed above this site in the adjoining Discovery Bay Coastal Park attracts many visitors. A small number of New Zealand fur seals are also reported to come ashore at Cape Bridgewater. Local dive instructors offer diving and snorkelling excursions where, in addition to observing seals in their environment, divers can admire diverse and abundant marine flora and fauna. The seals can also be viewed from the sea with a charter-boat operating throughout the year. Managers should ensure that an

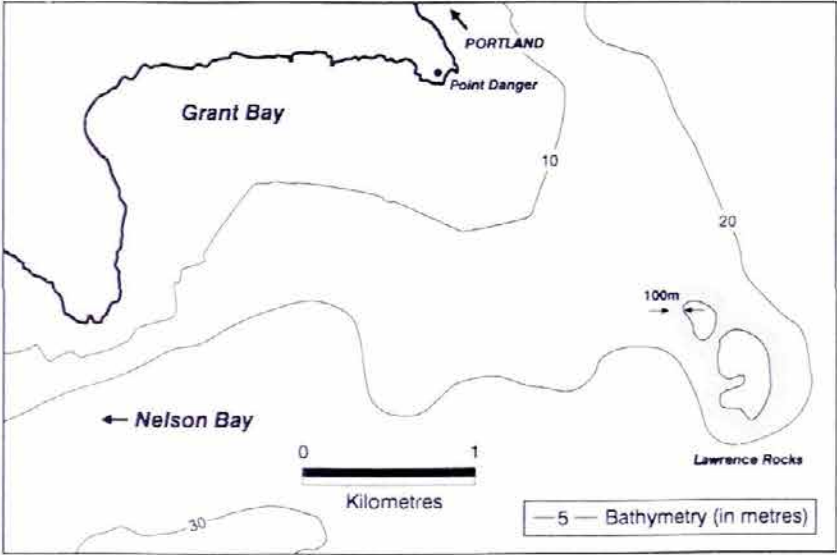


appropriate distance is kept between boats and rock platforms used by the seals to avoid unnecessary disturbance. Though mortality of seals in nets is generally low, it is a potentially

threatening process, and restrictions should be placed on netting near the colony to minimise seal injury and mortality through entanglement in mesh and gill nets.

D2 Lawrence Rocks Marine Special Management Area

This 24 ha area near Portland consists of waters around Lawrence Rocks, islands of volcanic rock. A kelp forest up to 12 m high is found in waters on the northern side of Lawrence Rocks. The western side offers diving and snorkelling opportunities within a natural harbour noted for its calm conditions and abundant marine life. The rocks themselves are of State geological and geomorphological significance. They are the highest offshore point of a largely submerged volcanic caldera beneath Nelson Bay. They have high values as breeding colonies for several species of seabirds. Species utilising the area include the little penguin, fairy prion, common diving petrel and the largest colony of gannets in Australia. The area is

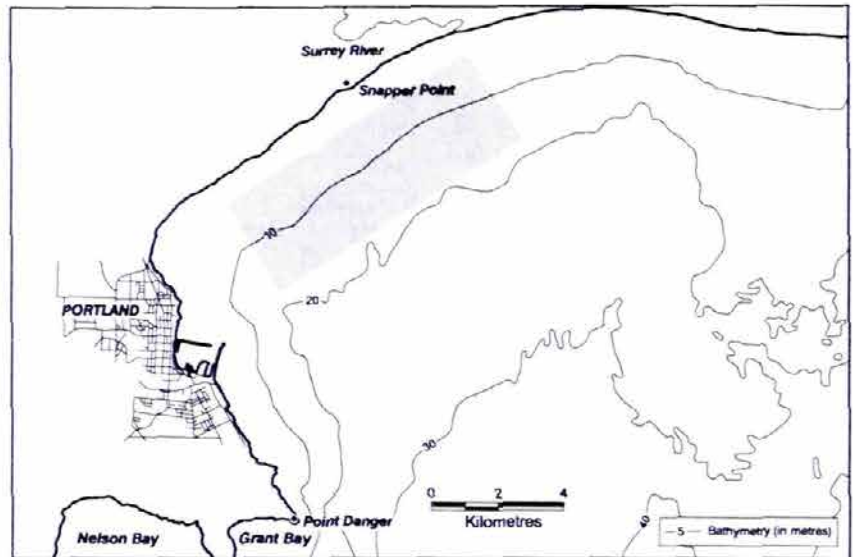


recommended as a marine special management area to ensure protection of the linked terrestrial and marine values.



D3 Portland Bay Marine Special Management Area

This 2676 ha area off Portland contains the most extensive known beds of *Amphibolis antarctica* seagrass on the open coast in Victoria. The highly productive seagrass ecosystem supports a diverse invertebrate community and is a nursery ground for juvenile fish such as King George whiting, and occasionally snapper and shark. The site is also one of very few locations where the rare brown alga *Cystophora cymodocea* occurs, growing attached to the seagrass. Low and high profile rocky reefs at this site also provide habitats for a range of reef species. This site is visually attractive for diving and snorkelling and is popular with recreational fishers who target a number of fish species. Under the provisions of the *Fisheries Act 1995*,

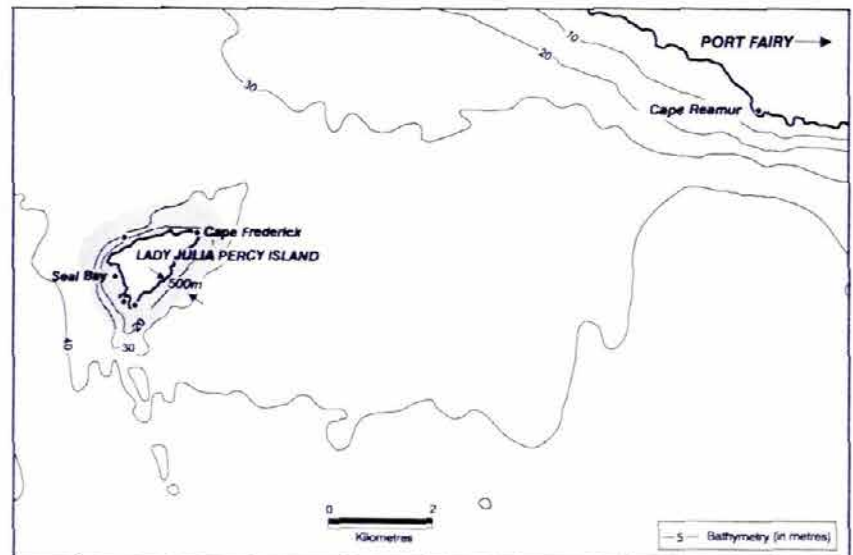


seining operations have been prohibited from the area from Point Danger to the mouth of the Surrey River, and the port managers in cooperation with the aluminium

smelter have put in place a dredge spoil disposal program that avoids impact on the seagrass.

D4 Lady Julia Percy Island (Deen Maar) Marine Special Management Area

This 430 ha area is of significant cultural and spiritual importance to the local Gundjtmara Aborigines, who associated the island with spirits of the dead. Lady Julia Percy Island is home to the second largest Australian fur-seal breeding colonies in Victoria. It is also a breeding ground for numerous birds. The island is also of national geological and geomorphological significance. The sharply sloping reefs of the southern and eastern sides of the island are covered by a dense kelp canopy, which provides habitat for other forms of marine life while at the northern end the island drops into a sandy seabed. The subtidal area around Lady Julia Percy Island is considered as one of the most spectacular underwater environments in Victoria. Commercial harvesting of abalone and rock



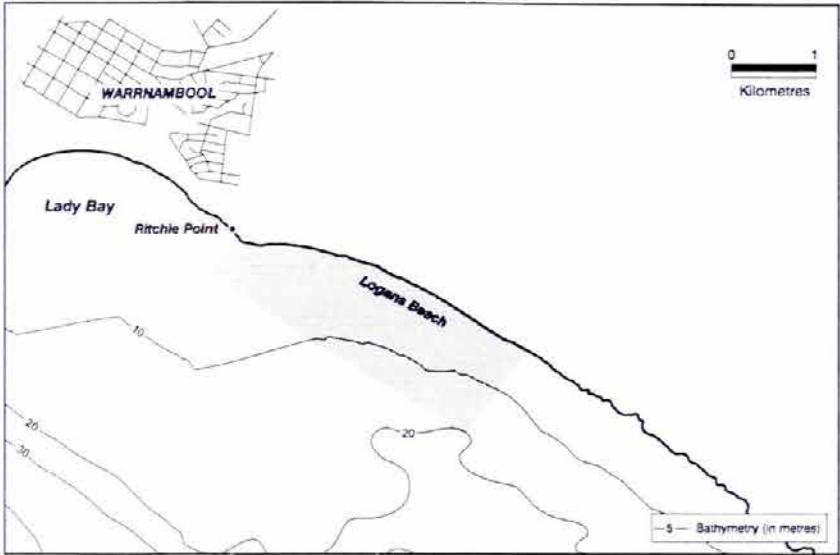
lobster takes place within the site with occasional mesh netting and long lining. As with Cape Bridgewater netting is a potentially threatening process, and restrictions should be placed on netting near the colony to minimise seal injury and mortality through entanglement in

mesh and gill nets. Rock lobster pots placed near seal breeding grounds can cause death of juvenile seals. Monitoring of juvenile seal mortality should be carried out. Disturbance to the colony during the breeding season should be avoided.



D5 Logans Beach Marine Special Management Area

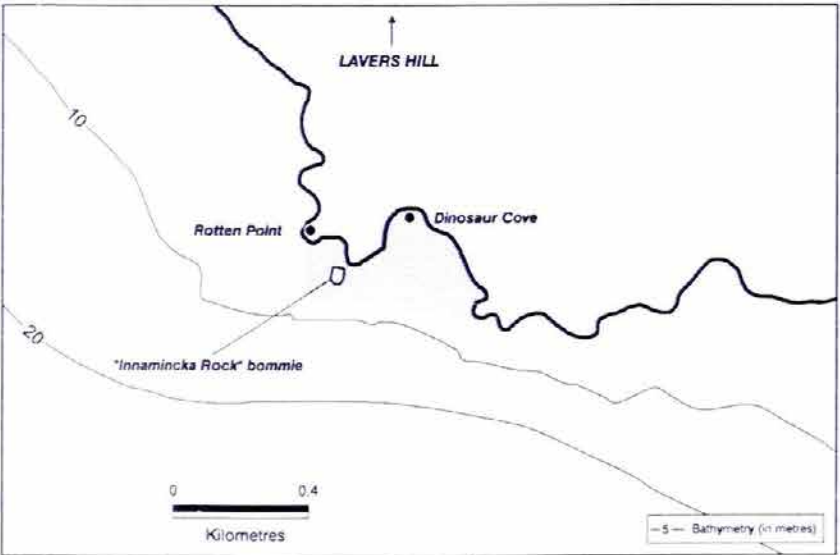
This 390 ha area near Warrnambool is a calving and nursery ground for the southern right whale. This whale is listed as an endangered species both at a National and a State level. It was listed under the *Flora and Fauna Guarantee Act* 1988 in 1990. The whales congregate in the general area every year from about May to October and breed approximately every three years. The exact boundaries of the breeding ground are not known, but whales with their young are often seen at Logans Beach. The whales move along the shore between a point 2 km east of Warrnambool (south of Lake Gilleard) and Port Fairy, up to 1.5 km offshore. The ECC supports the code of practice, signed between commercial fishers and the then



Department of Conservation and Natural Resources, ensuring no commercial fishing while whales are present in the Logans Beach area.

D6 Dinosaur Cove Marine Special Management Area

This 11 ha area contains spectacular underwater scenery comprising sheer underwater cliffs, massive boulders and a unique feature for this part of the coast, a large bommie, 'Innamincka Rock'. The complexity of the seabed is enriched with rock ledges, gutters and shallow sand/reef. Surveys have shown that an area as small as two square metres includes 15 species of sponges, ten species of ascidians, 27 bryozoans, and four hydroids. The coastline offers spectacular views of the ocean, steep cliffs, sea caves and magnificent rock platforms. The site has major palaeontological significance with the renowned dig site, Dinosaur Cove. The site is popular with a small number of keen rocky-shore based anglers.



Recommendations for Bays and Inlets
- Marine Protected Areas

Port Phillip Bay

This section sets out the recommendations for marine protected areas for Port Phillip Bay.

Port Phillip is a large marine embayment almost 2000 km² in area. Commonly known as Port Phillip Bay, it comprises 16 named bays, the best known being Swan Bay, Corio Bay and Hobsons Bay. It is extremely shallow for its size being only 24 metres at its deepest part, with much of its waters shallower than eight metres. The bay is a unique ecosystem, supporting diverse communities of birds, fish, bottom dwelling (benthic) invertebrates, seaweeds and microscopic algae. The benthic communities are exceptionally rich in species compared to similar ecosystems in other parts of the world.

Although the bay is surprisingly healthy in terms of water quality, the ecosystems of the bay are under continued pressure from urban and agricultural runoff, previous physical disruption (eg dredging), and recently from the spread of introduced marine species.

About three million people live close to Port Phillip Bay, making it Australia's most densely populated catchment, and one of the most urbanised coastlines in the world. Port Phillip Bay is enormously important to Victoria, and to Melbourne in particular. It is Australia's busiest port, and is also a huge recreational resource for residents and visitors. Recreational pursuits include swimming and beach activities, sightseeing, diving, recreational fishing, sailing and boating. Port Phillip Bay supports a commercial fishery and a growing aquaculture industry.

This part of the report gives descriptions of the recommended Marine National Parks, Marine Sanctuaries and Marine Special Management Areas. Part Two of this report provides an overview of the recommendations for marine protected areas, including recommendations for permitted uses and activities.

Note that in February 1998, the ECC provided the then Minister with a final recommendation for a marine park at Port Phillip Heads. In December 1998 the Minister asked the Council to review the recommendation having regard to the incompatibility of incorporating major shipping channels in a marine park. The ECC will provide a separate report on this matter to the Minister in due course.

Recommended Areas

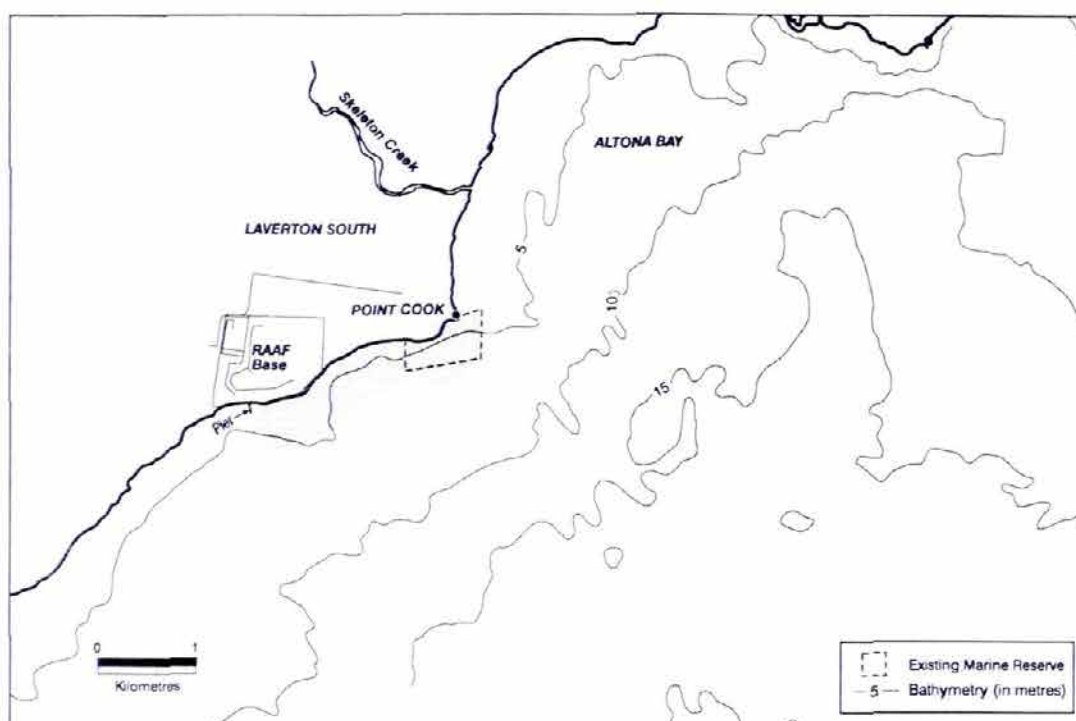
- A4 Point Cook Marine National Park

- B7 Jawbone Marine Sanctuary
- B8 Ricketts Point Marine Sanctuary

- D7 Clifton Springs Marine Special Management Area
- D8 Capel Sound Marine Special Management Area



A4 POINT COOK MARINE NATIONAL PARK



This relatively small park is on Melbourne's doorstep, and is an expansion of an existing fully protected reserve. A range of relatively intact habitats is protected in a park that is readily accessible by much of the population of Melbourne. This park, along with smaller marine sanctuaries at Jawbone near Williamstown, and Ricketts Point, form an impressive group of significant marine protected areas only a few kilometres from the city centre.

Location

- Located about 10 km east of Werribee, adjoining Point Cook Coastal Park, and including existing Point Cook Marine Reserve.
- Extends along approximately 5 km of coastline south of RAAF base to east of Point Cook, and 1 km offshore.
- Approximately 505 hectares.

Representation

- One of four Marine National Parks, with Yaringa, North Western Port and Rhyll Inlet, and three Marine Sanctuaries (Jawbone, Ricketts Point and Corner Inlet), proposed for the Bays, Inlets and Estuaries biophysical region of Victoria (IMCRA Victorian Embayments Region).
- The only park representing western shore environments of Port Phillip Bay.
- The following bay habitat types are represented in the park: sandy beaches, intertidal and sub-tidal rocky reefs, and sub-tidal soft sediments.
- Sub-tidal soft sediments include sand and clay.

(More general information on representation can be found in Part Two, Sections 6.3 and 6.6 of this report.)

Environmental significance

- Typical of the very shallow western shore of Port Phillip Bay with narrow/shallow beaches of mud and sand.
- Basalt reefs occur within the proposed park and support a community of algae and associated epibenthic fauna. Sponges, bryozoans, sea-stars, sea-urchins, anemones, ascidians, shellfish, crustaceans, molluscs, sharks, skates and many species of fish occur in this area.
- Large areas of free-floating algae in the deeper water provide important habitat for many invertebrates and fish, and are integral to nutrient cycling in the bay. Green and filamentous brown algae are found in shallower water.
- The adjoining Point Cook Coastal Park supports saline marsh and saltpan vegetation that is important waterbird habitat.
- The significant wetlands of Point Cook Coastal Park and Cheetham Wetlands (Altona Meadows)



are included in the Port Phillip Bay (Western Shoreline) Ramsar area. The Ramsar area, together with an area 300m offshore, a part of the existing Marine Reserve, are listed on the Register of the National Estate.

- Point Cook parallel sand ridges, relict spits and Skeleton Creek Spits have local/regional geomorphological significance.

Implications for users

Recreation and tourism

- The proposed park has excellent access and many visitor facilities on shore, and is popular for bird-watching, sightseeing, diving and snorkelling.
- Recreational fishing is common along much of this coastline, including boat-based fishing for King George whiting, snapper, and garfish, and shore-based fishing for garfish and yellow-eye mullet. On balance, the impact of the restrictions on recreational fishing is considered to be acceptable due to the availability of alternative areas nearby.
- There will be no restrictions on boating, diving, and other non-harvesting activities. Increased diving and recreational opportunities are likely to result from the changed management arrangements.

Commercial fishing

- The major commercial activity is abalone harvesting valued, in 1996/97, at \$775 000 annually (or 3.9% of the 1996/97 Central Zone catch). There is no rock lobster catch in this area. Other fishing amounted, in 1996/97, to about \$14 000. The estimated total value of commercial fishing, in 1996/97 is \$789 000. Estimates of the value of commercial fishing are from MAFRI (1999a).

- On balance, Council believes the impact on commercial fishing to be acceptable, given that few areas in northern Port Phillip Bay are highly protected, and that other commercial abalone reefs in this part of the Central Zone will continue to be available for harvesting.

Management and compliance issues

- The proposed park is readily accessible, and the high numbers of people who use the area could assist in surveillance.
- Parks Victoria runs an educational and interpretive summer program involving the intertidal zone at Point Cook.

Assessing effectiveness

- Monitoring and assessment on the effectiveness of the park will be assisted by comparison with similar areas where activities such as fishing take place. Areas that could be included in a monitoring program are any other rocky reef sections of the western shore of Port Phillip Bay.

INFORMATION SOURCES

From all information used for this area, including extensive consultation, the following reference numbers contain site-specific data: **4, 22, 27, 29 and 35.**



Marine Sanctuaries

B7 Jawbone Marine Sanctuary

This 42 ha site at Williamstown is a significant scientific reference area, with an unusually diverse array of habitats, less than 10 kilometres from the centre of Melbourne.

The areas around the old Williamstown Rifle Range have been protected from human access since the turn of the century until the late 1980s when the Rifle Range was sold. Since then there has been significant damage to sensitive mangrove and saltmarsh areas, as people have sought access to harvest shellfish. The site supports habitats including rocky basalt reef, seagrass beds, intertidal flats, saltmarsh and the largest occurrence of white mangrove in Port Phillip Bay. The reef has a diverse algal community and associated fauna, which is, for Port Phillip Bay, unusually unmodified. The softer subtidal sediments are fine clayey sands, which support high species richness. The basalt platform is also a roosting site for migratory waders. Land access to the area is currently restricted, and this should continue to be the case.

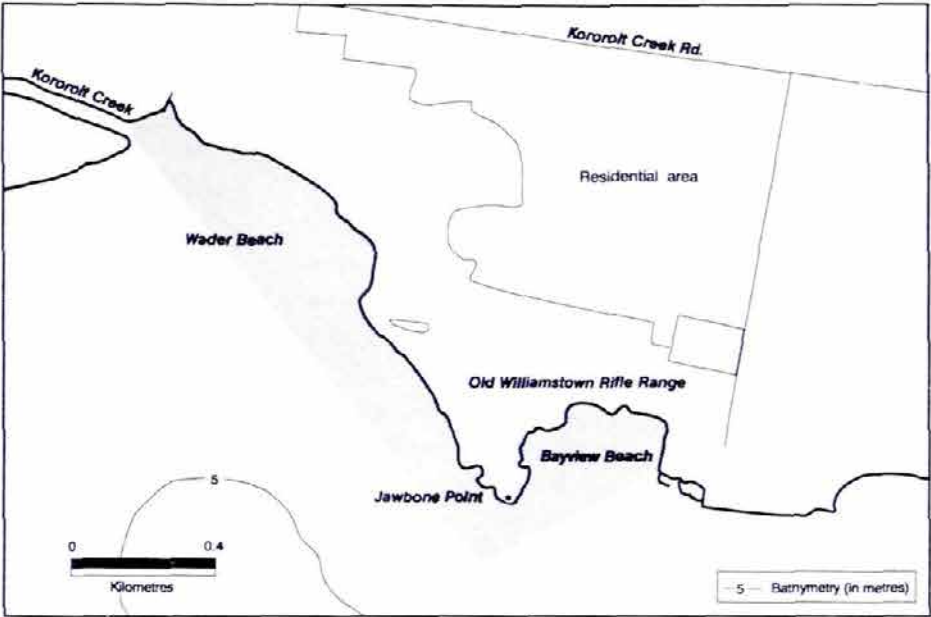
B8 Ricketts Point Marine Sanctuary

This area of 315 ha at Beaumaris is identified as contributing to the representative system of marine protected areas as an example of sandstone reef habitats in northern Port Phillip Bay. The site is readily accessible to large numbers of people, providing a major resource for public enjoyment and education.

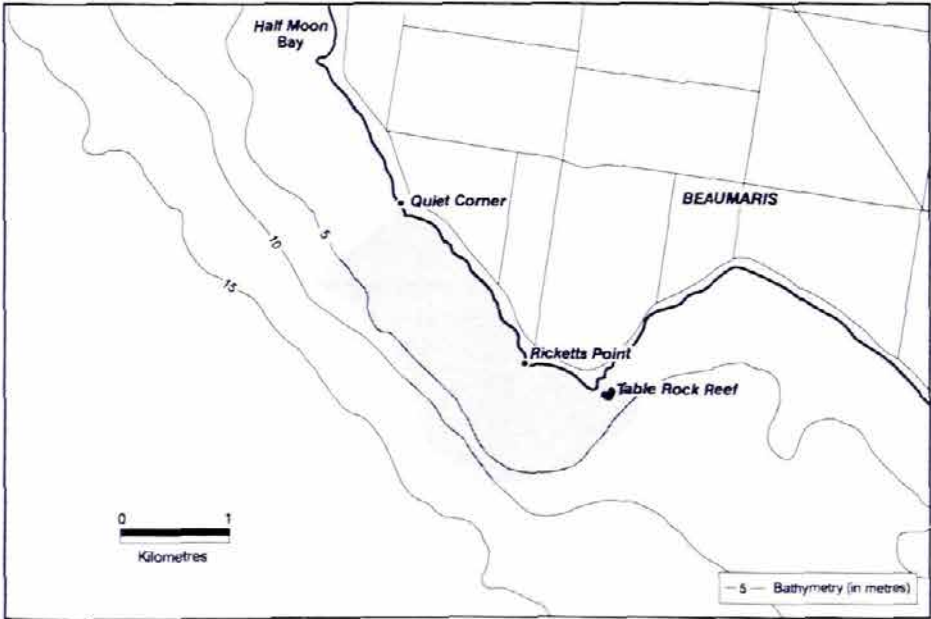
The sanctuary encompasses rocky (sandstone) intertidal and subtidal habitats, intertidal sandy beaches and subtidal soft substrates. The offshore reefs have a high diversity of flora and fauna. The adjacent Beaumaris Cliffs are significant as a late Miocene fossil site. The area's popularity for recreational fishing, diving, snorkelling and shellfish collection has resulted in pressure on species using the reef, such as juvenile snapper, and degradation of the intertidal area through intensive shellfish collection and launching of boats over the reefs. The area of the proposed sanctuary has some netting for fish occurring within its boundaries, and the subtidal reefs are used irregularly by commercial abalone divers. Although recreational anglers currently use the reefs of the area, alternative areas are available nearby. This area is currently degraded due to over exploitation over many years, but with adequate protection, the area will re-establish creating a major asset for Melbourne.



B7 Jawbone Marine Sanctuary



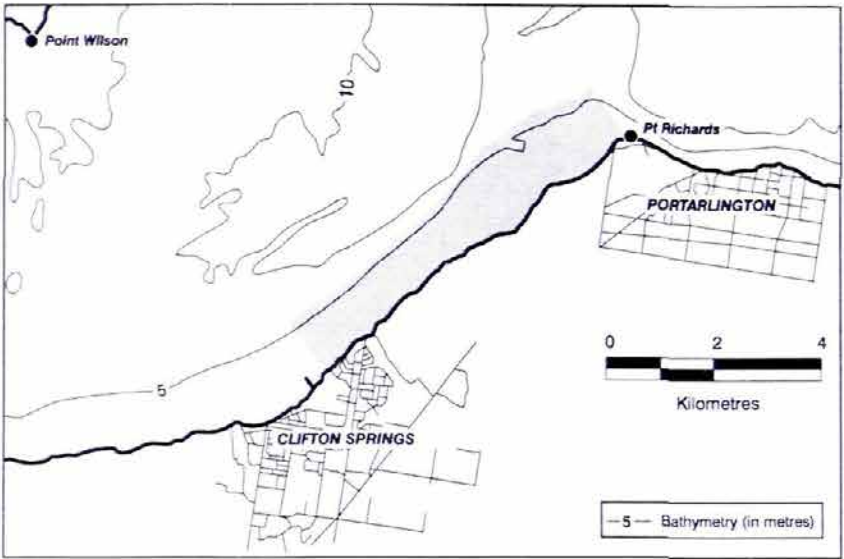
B8 Ricketts Point Marine Sanctuary



Marine Special Management Areas

D7 Clifton Springs Seagrass Beds Marine Special Management Area

This 784 ha area contains some of the best examples of intertidal and subtidal seagrasses (*Heterozostera tasmanica*, *Zostera muelleri*) in the Geelong Arm of Port Phillip Bay and is an important area for settlement of larval fish, including King George whiting and shark. The seagrass at Clifton Springs is part of a larger seagrass meadow extending westward from Point Richards to Point Henry. Seagrasses in the Geelong Arm have experienced substantial dieback and regrowth in past years and continue to be threatened by poor water quality, introduced pests such as the European tube worm, *Sabella*, as well as physical damage from propeller scour and anchoring. Land access to this site is restricted, however there is good boat access from the Clifton Springs and Portarlington boat ramps. There may be potential to

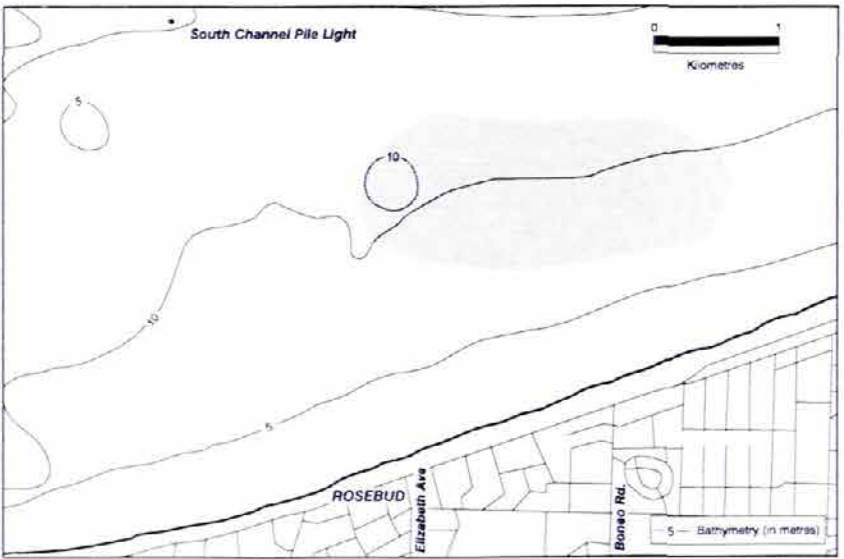


develop visitor education facilities at Portarlington to highlight the important ecological role of seagrass communities in the Bay. Some boating and recreational fishing occurs within this area, whilst commercial fishing tends to be concentrated in the western areas

of the site. Management of the area should focus on ensuring the continued health of the seagrass beds, with fishing and boating activities that don't impact on seagrasses being allowed to continue.

D8 Capel Sound Marine Special Management Area

This 294 ha area lies offshore from Rosebud, and encompasses the wreck of the Hurricane and a hard coral reef. The area surrounding the Hurricane is noted in particular for an unusually extensive bed of sea pens, and numerous reef fish. The reef which rises to about six metres has a colourful understorey, dominated by an extensive covering of hard coral, and hence is vulnerable to disturbance by aquarium collectors. This issue should be addressed by managers. Hard corals are relatively uncommon in Victoria. Recreational line fishing for pelagic fish such as snapper and whiting is popular in summer in this area. It would be appropriate to prohibit spearfishing in this limited area.



Western Port

This section sets out the recommendations for marine protected areas for Western Port.

The waters of Western Port cover nearly 700 km², more than a third of which are exposed as mud flats at low tide. Two large islands are situated within the bay, French Island and Phillip Island. The bay has very high natural values and the whole area is listed as a wetland of international importance under the Ramsar Convention. Western Port has an unusually wide range of habitat types, including deep channels, extensive seagrass meadows, mangroves and saltmarsh. Two thirds of Victorian bird species have been recorded in the bay.

The bay supports a commercial fishing industry and a growing recreational fishery. Hastings in the north-western part of the bay is one of Victoria's four major commercial ports, with most ships carrying liquid fuel. The deep water in the Western Entrance and North Arm of Western Port is significant for deep draught shipping. No other harbour in Victoria and few in Australia provide sheltered water of such depth.

This part of the report gives descriptions of the recommended Marine National Parks and Marine Special Management Areas for Western Port. Part Two of this report provides an overview of the recommendations for marine protected areas and

aquaculture areas, including recommendations for permitted uses and activities. Note that the ECC is recommending that the Government investigate the establishment of a Biosphere Reserve for Western Port.

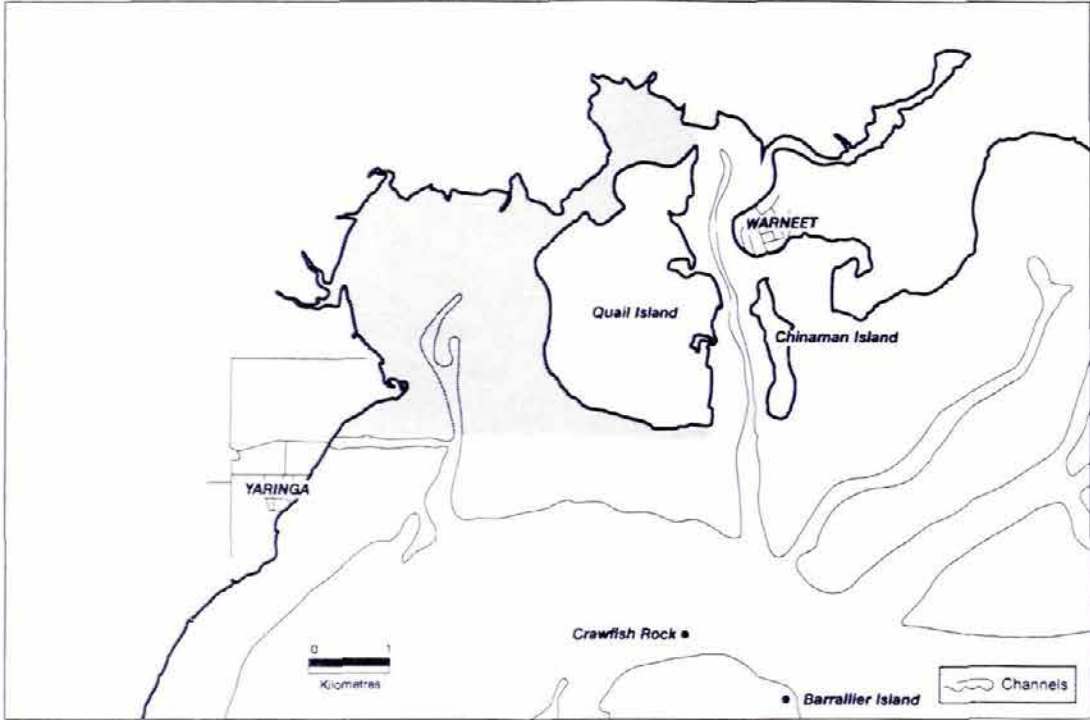
Recommended Areas

- A5** Yaringa Marine National Park
- A6** North Western Port Marine National Park
- A7** Rhyll Inlet Marine National Park

- D9** Honeysuckle Reef Marine Special Management Area
- D10** Crawfish Rock Marine Special Management Area
- D11** Observation Point (Rhyll) Marine Special Management Area
- D12** San Remo Marine Special Management Area
- D13** Bass River Delta Marine Special Management Area



A5 YARINGA MARINE NATIONAL PARK



This recommended park is one of three in Western Port. It protects intertidal mudflats and extensive mangrove and saltmarsh areas in one of the least disturbed and least accessible parts of the Bay.

Location

- Located in Western Port, about 9 km south-west of Tooradin, and adjacent to Quail Island Nature Conservation Reserve.
- Extends along the coastline north of Yaringa private marina to the eastern coastline of Quail Island.
- Approximately 930 hectares.

Representation

- One of four Marine National Parks (with Point Cook, North Western Port and Rhyll Inlet) and Corner Inlet Marine Sanctuary, proposed for the Bays, Inlets and Estuaries biophysical region of Victoria (IMCRA Victorian Embayments Region).
- The following bay habitat types are represented in the park: saltmarsh, mangroves, sheltered intertidal mudflats and sub-tidal soft sediments in tidal channels.

(More general information on representation can be found in Part Two, sections 6.3 and 6.6 of this report.)

Environmental significance

- The relatively undisturbed mangrove (*Avicennia marina*) and saltmarsh habitats of Watson Inlet and Quail Islands are of State geomorphological significance. Mangroves are a vital part of the bay ecosystem and provide important habitat for numerous invertebrates including crustaceans (crabs, shrimps and sand hoppers), marine snails and bivalves, adult and juvenile fish.
- The intertidal mud flats are of national zoological significance, with many waterbirds and waders roosting among the mangroves and waders foraging in the surrounding muddy substrates.
- The area is part of the Western Port Ramsar wetlands.
- The adjacent coast, including the coast of Quail Island, supports good examples of sand heathland, coastal saltmarsh, and low woodland dominated by coast manna gum. Quail and Chinaman Islands are considered to be of State botanical and zoological significance. Currently they are managed as a Nature Conservation Reserve, extending 150 m out from the high water mark.



Implications for users

Recreation and tourism

- The area is not readily accessible by land or sea, and only limited recreational fishing takes place. There will be no restrictions on boating and other non-harvesting activities.
- The impact of the restriction on recreational fishing will be minimal as there is currently little fishing in the proposed park.
- Development and dredging activities which impact upon the natural values of this park will not be allowed. It is appropriate that the channel leading into the nearby marina continue to be maintained by dredging. This dredging should continue to be managed so that impacts on the park are minimal.

Commercial fishing

- A limited amount of fishing takes place within the proposed park, specifically mesh netting for mullet.

Management and compliance issues

- Access to the site is limited due to the shallow nature of the intertidal channels.
- The location of the proposed park adjacent to the existing North Western Port Nature Conservation Reserve will facilitate management.

Assessing effectiveness

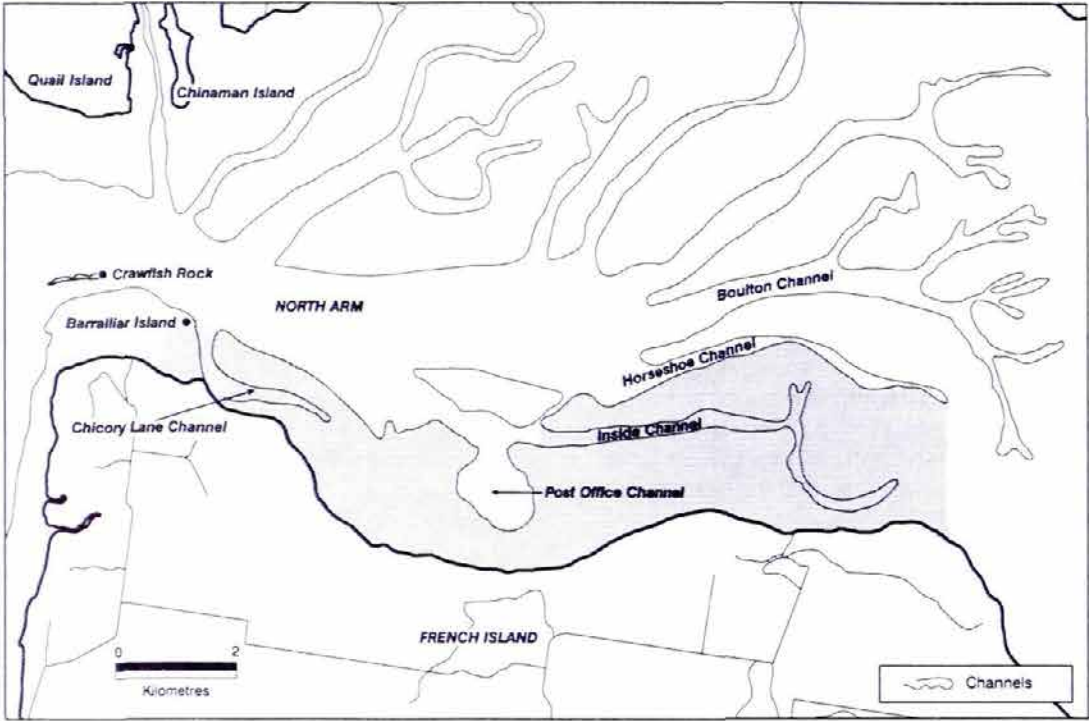
- Monitoring and assessment of the effectiveness of the park will be assisted by comparison with similar areas where activities such as fishing, dredging etc, take place. Areas near Rutherford Inlet and Chinaman Island could be included in a monitoring program.

INFORMATION SOURCES

From all information used for this area, including extensive consultation, the following reference numbers contain site-specific data: **38, 39, 40, 41 and 42.**



A6 NORTH WESTERN PORT MARINE NATIONAL PARK



This recommended park is one of three in Western Port. It protects seagrass beds as well as intertidal mudflats, areas of deeper channels, mangroves and saltmarsh. The popular fishing location of Post Office Channel has not been included in the park.

Location

- Located about 10 km south of Tooradin, and adjacent to French Island National Park.
- Extending approximately 15 km along the northern shore of French Island; the park's northern boundary follows North Arm and the Horseshoe Channel. Post Office channel is not included in the park.
- Approximately 2 570 hectares.

Representation

- One of four Marine National Parks (with Point Cook, Yaringa and Rhyll Inlet) and Corner Inlet Marine Sanctuary, proposed for the Bays, Inlets and Estuaries biophysical region of Victoria (IMCRA Victorian Embayments Region).
- The following bay habitat types are represented in the park: seagrass beds, mangroves, sheltered intertidal mudflats, sandy beaches and sub-tidal soft sediments in tidal channels.

(More general information on representation can be found in Part Two, sections 6.3 and 6.6 of this report.)

Environmental significance

- The proposed park contains areas of seagrass (*Heterozostera tasmanica* and *Zostera muelleri*) and is one of the few areas where little loss of seagrass has been recorded. These are nursery areas for fish, including commercially important species such as whiting.
- Well-developed tidal channel system of varying depth, profiles and orientations contributing to the high diversity of habitats.
- The area is part of the Western Port Ramsar wetlands. Intertidal flats are significant wader and foraging habitat used by 32 migratory species.
- Includes the waters around Barrallier Island - one of the bay's 13 high tide roost sites – areas particularly sensitive to disturbance.
- The north shore of French Island is one of the major areas of saltmarsh and mangrove fringe in Victoria and is of State geomorphological significance.



Implications for users

Recreation and tourism

- Popular area for boat-based recreational fishing for King George whiting, rock flathead, snapper, southern sea garfish, mostly in deeper channels towards the outer boundaries of the park.
- While recreational fishing is popular in the area, the impact of the park will be limited as the popular Post Office Channel has been excluded, and there are alternative areas available nearby.
- There will be no restrictions on boating and other non-harvesting activities.

Commercial fishing

- The major commercial activity is mesh netting valued, in 1996/97, at \$52 500. Other fishing activities include King George whiting and garfish seining, beach and estuary seining and snapper longlining amounting, in 1996/97, to about \$32 400. Estimated total value of commercial fishing in 1996/97 – \$85 000. Estimates of the value of commercial fishing are from MAFRI (1999a). These estimates are for a larger area and the ECC believes that, with the exclusion of Post Office Channel, the value of fishing within the proposed Marine National Park is less than \$40 000.
- Management of Bay and Inlet Fisheries in Victoria is currently being reviewed, and involves the voluntary buy-back of commercial fishing licences. The outcomes will influence management of the proposed park, but could be expected to significantly reduce commercial harvesting pressure in the park.

Consideration of alternative areas

- Other nearby areas that have been considered previously include various sections of Western Port waters bordering the northern and western shores of French Island. On balance, the recommended park is believed to best provide for conservation of a range of habitats with an acceptable level of impact on current uses.

Management and compliance issues

- The proposed park is readily accessible from Warneet, Blind Bight, Tooradin and other Western Port shore jetties.

Assessing effectiveness

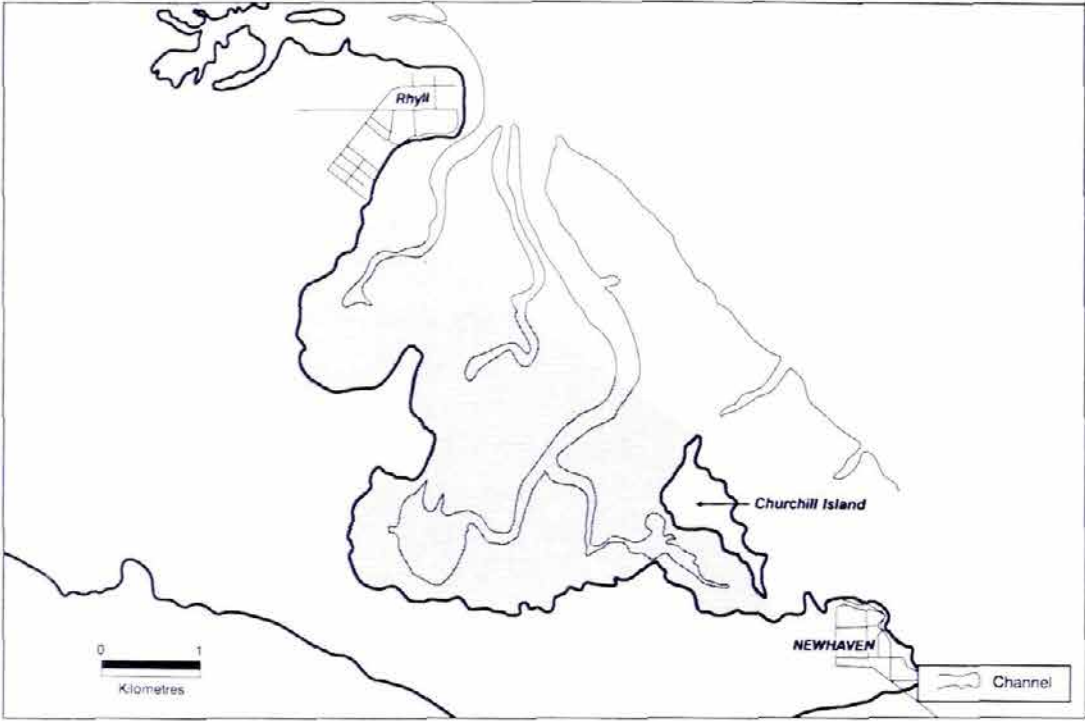
- Monitoring and assessment of the effectiveness of the park will be assisted by comparison with similar areas where activities such as fishing, take place. Areas, west of the proposed park, adjoining the northern shoreline of French Island, could be included in a monitoring program.

INFORMATION SOURCES

From all information used for this area, including extensive consultation, the following reference numbers contain site-specific data: 22, 38, 39, 40, 41 and 42.



A7 RHYLL INLET MARINE NATIONAL PARK



The recommended park is one of three in Western Port. It protects a variety of sheltered habitats, including intertidal mudflats, seagrass beds and deep channels.

Location

- Located south of Rhyll, on the eastern shore of Phillip Island.
- Extends along the coastline south of Rhyll township to the north point of Churchill Island and along the island's western shore to the Bridge.
- Approximately 1 010 hectares.

Representation

- One of four Marine National Parks (with Point Cook, Yaringa and North Western Port) and Corner Inlet Marine Sanctuary, proposed for the Bays, Inlets and Estuaries biophysical region of Victoria (IMCRA Victorian Embayments Region).
- The following bay habitat types are represented in the park: seagrass beds, mangroves, sheltered intertidal mudflats, sandy beaches, sub-tidal soft sediments in tidal channels and rocky intertidal habitats (cobble and shingle).

(More general information on representation can be found in Part Two, sections 6.3 and 6.6 of this report.)

Environmental significance

- Significant roosting and feeding habitat for migratory waders.
- The intertidal mud flats extending from Rhyll to Newhaven are of State significance, and the area from Rhyll Inlet to Churchill Island is of national significance as part of a group of primary foraging areas for the 32 migratory waders found in Western Port (especially Whimbrels and Bar-tailed Godwits).
- The area is part of the Western Port Ramsar wetlands.
- Seagrasses *Zostera muelleri*, *Amphibolis antarctica* and *Heterozostera tasmanica*.
- The raised beach between Chambers Point and Long Point and the adjacent Churchill Island are of State geological and geomorphological significance.



Implications for users

Recreation and tourism

- The general area is popular for boat-based recreational fishing and hand spearing, and shore-based sightseeing.
- The areas particularly popular for recreational fishing, off Rhyll township and the channels between Rhyll and Churchill Island, are not included in the park, to minimise impacts on users.
- There will be no restrictions on boating and other non-harvesting activities.

Commercial fishing

- The major commercial activity is meshnetting valued, in 1996/97, at \$7 000. Other fishing activities amounted, in 1996/97, to about \$4 000. Estimated total annual value of commercial fishing in 1996/97 is \$11 000. Estimates of the value of commercial fishing are from MAFRI (1999a).
- Effects on commercial fishing, as for recreational fishing, are likely to be minor, as much of the area is intertidal, and the lower portions of the deeper channels, are outside the park. Alternative areas are also available nearby.
- Management of Bay and Inlet Fisheries in Victoria is currently being reviewed, and involves the voluntary buy-back of commercial fishing licences. The outcomes will influence management of the proposed park, but could be expected to significantly reduce commercial harvesting pressure in the park.

Management and compliance issues

- Ready access from Pleasant Point, Churchill Island, Newhaven (Boat Ramp) and San Remo will allow visitors to enjoy the park.

Assessing effectiveness

- Monitoring and assessment of the effectiveness of the park will be assisted by comparison with similar areas where activities such as fishing, take place. The area, east of the recommended park, between Corinella and Reef Island, could be included in a monitoring program.

INFORMATION SOURCES

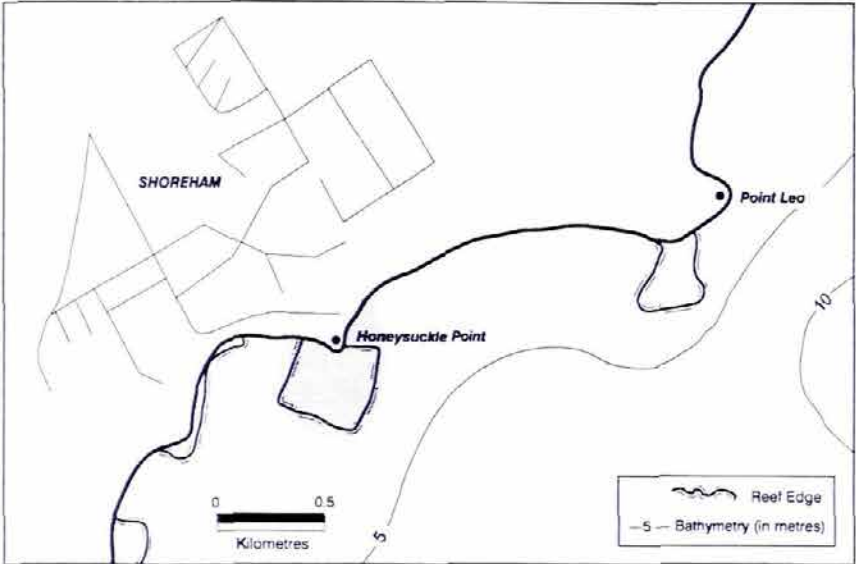
From all information used for this area, including extensive consultation, the following reference numbers contain site-specific data: 22, 38, 39, 40, 41 and 42.



Marine Special Management Areas

D9 Honeysuckle Reef Marine Special Management Area

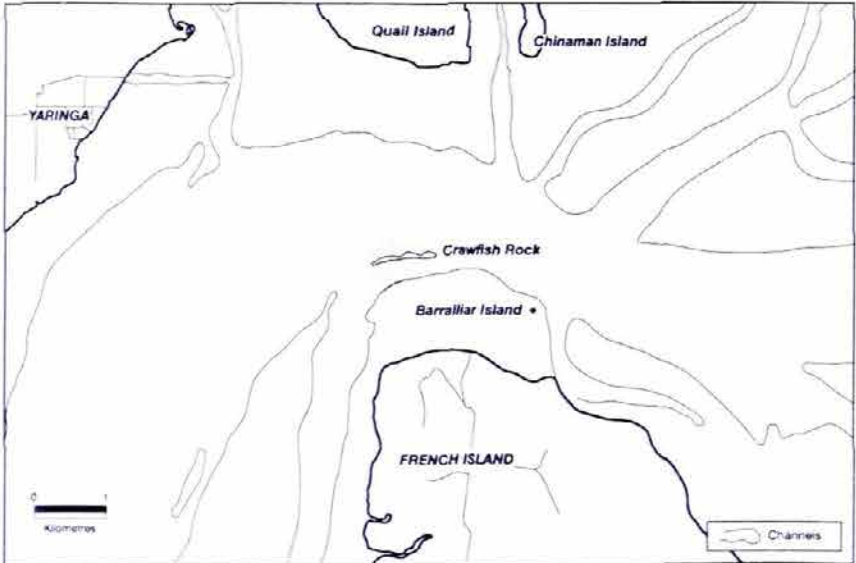
This 23 ha area is recommended for its diverse intertidal reef communities. It is predominantly flat and shallow, within a relatively sheltered bay area. Honeysuckle Reef has a shallow pool area used extensively by schools of young fish. The small site includes mainly intertidal reefs and some subtidal reefs. It is popular for walking, beachcombing, sightseeing and some snorkelling. Part of the adjacent beach is used as a high tide roost for migratory waders. The subtidal reef also provides excellent opportunities for underwater recreation. Extensive shellfish harvesting has depleted the intertidal and subtidal invertebrate populations, and the intertidal rock platform is used for rocky shore angling. Management of the area



should focus on developing and implementing strategies for restoration of the intertidal rocky reef communities, and minimising disturbance to high tide roosts,

D10 Crawfish Rock Marine Special Management Area

This 46 ha area is an unusual intertidal/subtidal reef located in the north-west of Western Port. Crawfish Rock is of interest as it supports a benthic fauna with apparent affinities with deep water communities in Bass Strait. Due to high water turbidity around Crawfish Rock reducing light penetration, many deep-water species of algae, hydroids and sponges occur at unusually shallow depths. The Underwater Study Group of Victoria described the high density of flora and fauna at this site in a 1971 report. Overall there are believed to be more than 500 species present here. High numbers of species have been recorded for some groups – for example, 150 species of sponges, 123 species of hydroids and 34 species of ascidians. Crawfish Rock



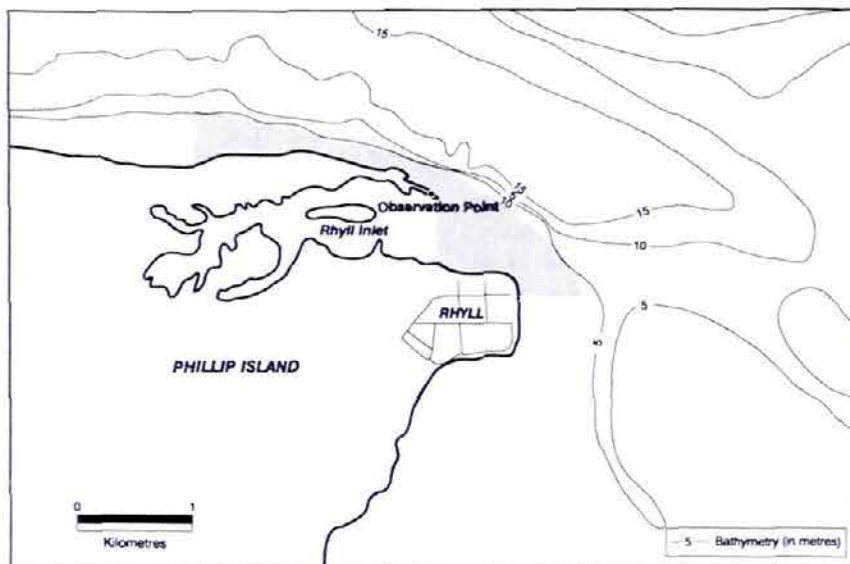
also has a number of distinct communities characterised by differing combinations of light, current energy and substrate types. A recent visit conducted by divers from the Marine Research Group

indicates that the area has remained largely intact since the original 1971 survey. Specific strategies to protect the values of the site should be developed through the French Island National Park Management Plan.



D11 Observation Point (Rhyll) Marine Special Management Area

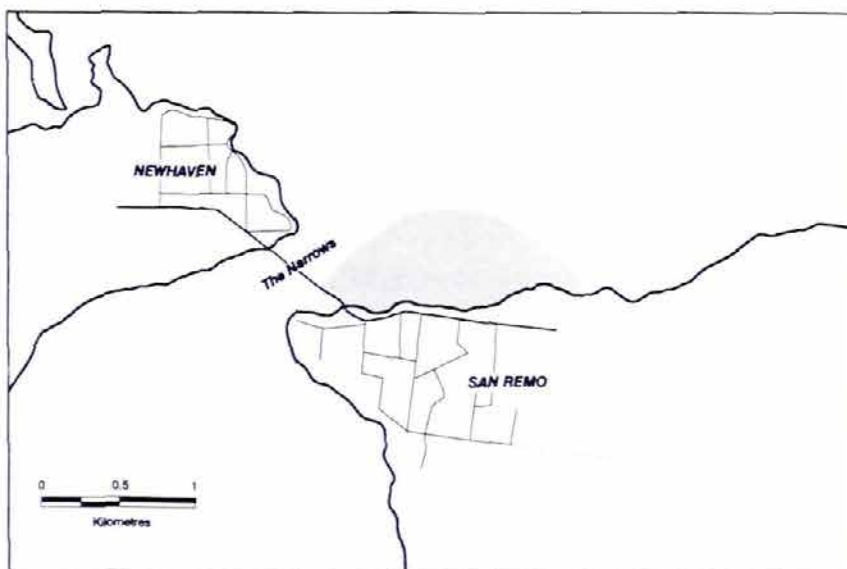
This 124 ha area is part of Rhyll Inlet on Phillip Island, and consists primarily of intertidal mudflats and low profile basalt reef, with a complex array of active and relict geomorphological features. The abundant bird life, mangroves, saltmarsh, soft sediments and dynamic sand spit at this site are of high conservation value. The site is within a primary foraging area for 32 species of migratory waders and is recognised as a major high tide roost site for many bird species. Observation Point, along with the remainder of Rhyll Inlet and Rhyll Swamp has international significance as bird habitat and falls within the Western Port Ramsar area. The western boundary of the



site aligns with the western boundary of the Phillip Island Nature Park, and it is recommended that incorporation into the Nature Park be considered.

D12 San Remo Marine Special Management Area

This 72 ha area contains the only marine community listed under the *Flora and Fauna Guarantee Act* 1988. It is the only known example of its kind, comprising an extremely rich opisthobranch (sea slugs) and bryozoan (sea mosses) community. 125 species of opisthobranchs have been recorded at San Remo of which eight are known only from this site. The diversity of substrate types including patches of sand, mud, boulders and vesicular, weathered basalt, the north-facing aspect, the low wave energy and proximity to a fast-flowing tidal channel, are some of the factors that contribute to the existence of this apparently rare community. The site includes the edge of a deep and fast-flowing tidal channel, which is the most diverse part of the community. There are a number of

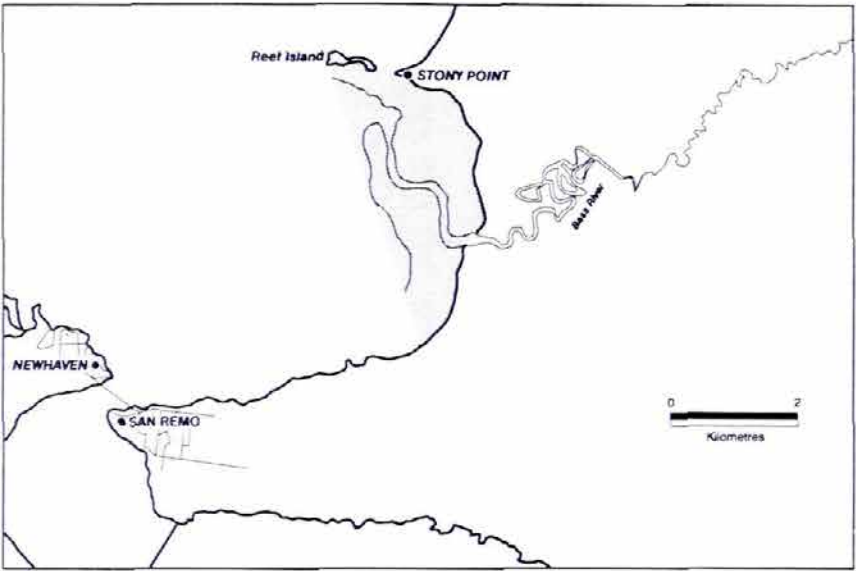


measures available under the *Flora and Fauna Guarantee Act* to control works and activities which may pose a threat to the community.



D13 Bass River Delta Marine
Special Management Area

This 636 ha area in eastern Western Port is recommended as a special management area, because of its ecological value as a fish nursery, bird roost, and for the diversity of habitats including intertidal flats and subtidal areas. The shallow waters of the Bass River delta support diverse fish life and the area is a nursery for various species of shark and whiting. The intertidal flats are foraging areas for waders associated with the adjoining high-tide roost at Reef Island. The delta complex is of geomorphological significance and supports significant mangrove-saltmarsh habitat, extensive intertidal and subtidal flats of bare sand, dense algal beds and seagrass. The delta is a major recreational boat-based fishing area with significant



commercial seine and mesh netting activity. Whiting and flathead are the species predominantly targeted. The Bass delta suffers from serious infestation of the exotic weed

Spartina. Within a management planning process, threats to the ecological values of the site should be identified and appropriate protection measures be implemented.



Other Bays and Inlets

This section sets out the recommendations for marine protected areas for bays and inlets other than Port Phillip Bay and Western Port. (Note that the Gippsland Lakes are specifically excluded under the Terms of Reference).

The management of particular areas within some bays and inlets is subject to international obligations to protect wetlands and specific birds, such as the Ramsar Convention on Wetlands of International Importance and bilateral migratory bird agreements with Japan and China. Management plans have been prepared for a number of Victoria's bays and inlets. Catchment management plans and coastal action plans are an appropriate means to address management issues affecting smaller estuaries. In western Victoria, estuary management is a specific focus of current coastal planning being carried out by the Western Coastal Board. In eastern Victoria, many smaller inlets and estuaries are within national parks or other protected areas, and management issues are dealt with through park management planning processes, eg Wingan and Tamboon Inlets in the Croajingolong National Park.

The Corner Inlet/Nooramunga area in south Gippsland is Victoria's third largest embayment, and its natural values were recognised in the mid 1980s when it was declared a marine and coastal park. The whole area is listed as a wetland of international importance under the Ramsar Convention. The inlet supports a commercial fishery and is also popular for recreational fishing and boating. There are four small ports in the area: Port Franklin, Port Welshpool, Port Albert and Barry Beach.

Shallow Inlet and Anderson Inlet are small inlets in south Gippsland, with significant values especially for wading birds. Shallow Inlet and adjoining coastal land was declared a marine and coastal park in the mid-1980s. Both Shallow Inlet and Anderson Inlet are very popular for beach activities and recreational fishing and boating.

This part of the report gives a description of the Corner Inlet Marine Sanctuary. The Shallow Inlet, Corner Inlet and Nooramunga Marine Conservation Parks (C2, C4 and C5 on Map A) are not described in full as they are existing marine and coastal parks. Part Two of this report provides an overview of the recommendations for marine protected areas, including recommendations for permitted uses and activities.

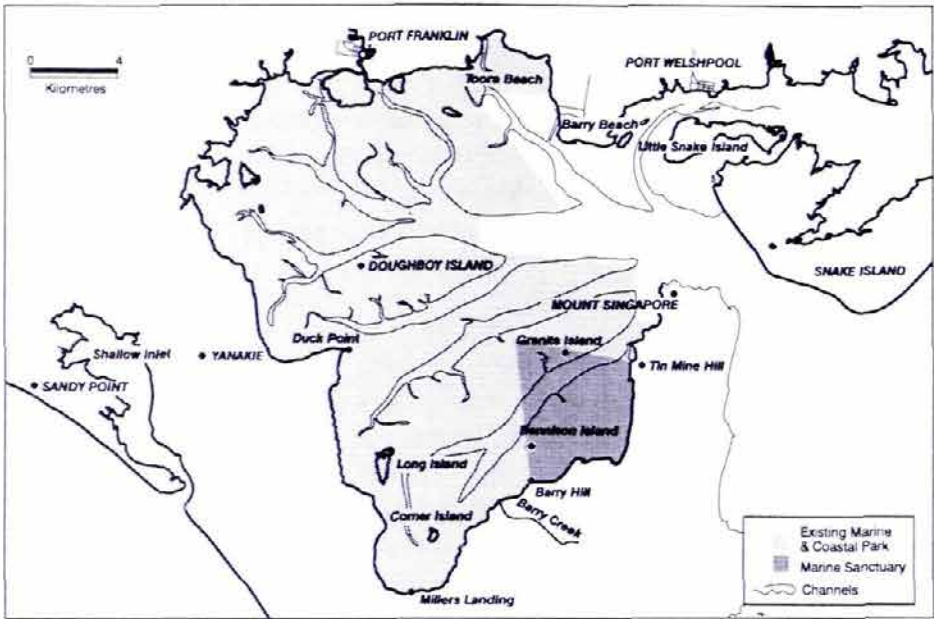
Recommended Areas

B10 Corner Inlet Marine Sanctuary

- C2 Shallow Inlet Marine Conservation Park
- C4 Corner Inlet Marine Conservation Park
- C5 Nooramunga Marine Conservation Park



B10 Corner Inlet Marine Sanctuary



This 2 490 ha site encompasses many of the natural values of Corner Inlet and Nooramunga marine waters. Corner Inlet is an internationally significant Ramsar area and supports up to 50% of migratory waders visiting Victoria. It contains extensive seagrass meadows including the only substantial beds of broad-leafed-seagrass (*Posidonia australis*) in Victoria, and displays scenery ranging from the low watery landscapes of the marshes and dunes to the dramatic backdrop of the Wilsons Promontory National Park. The following habitats are represented in the park: seagrass, mangrove, intertidal sandy beaches, sub-tidal soft sediments in pelagic (tidal channels) habitats. This large Marine Sanctuary is one of several highly protected areas proposed for the Bays, Inlets and Estuaries biophysical region of Victoria (IMCRA Victorian Embayments Region). This area is within the recommended Corner Inlet Marine Conservation Park, established in 1986. The estimated total annual value of commercial fishing is approximately \$100 000 (ECC estimate based on MAFRI, 1999a).



Recommendations for Eastern Victoria
- Marine Protected Areas

Eastern Victoria

This section sets out the recommendations for marine protected areas for the open coast between Point Nepean (at Port Phillip Heads) and the New South Wales border. Recommendations for bays and inlets are described separately in Part Four.

The marine environment along this coastline varies from shallow rocky reef environments in the cool Bass Strait waters of central Victoria to warmer water environments close to the NSW border. Warmer water habitats off east Gippsland are often very diverse, including flora and fauna from both cool and warm water. Beyond the rocky shores and beaches close to Melbourne, the coastline includes the much loved granite landscapes of Wilsons Promontory, the long sandy sweep of the Ninety Mile Beach and the coastal wilderness of Croajingolong National Park.

Other than Lakes Entrance and areas close to Melbourne, there are few large regional centres situated on the coast in eastern Victoria. There are however a number of smaller towns such as Inverloch, Seaspray, Golden Beach, Marlo and Mallacoota, where agriculture, tourism and fishing are major economic activities. Oil and gas from the offshore Gippsland Basin platforms are brought onshore in the Ninety Mile Beach area, and piped for processing in plants at Longford near Sale.

This part of the report gives descriptions of the following recommended Marine National Parks, Marine Sanctuaries, and Marine Special Management Areas. The Bunurong Marine Conservation Park and the Wilsons Promontory Marine Conservation Park (C1 and C3 on Map A) are not described as they are existing marine parks. Part Two of this report provides an overview of the recommendations for marine protected areas, including recommendations for permitted uses and activities.

Recommended Areas

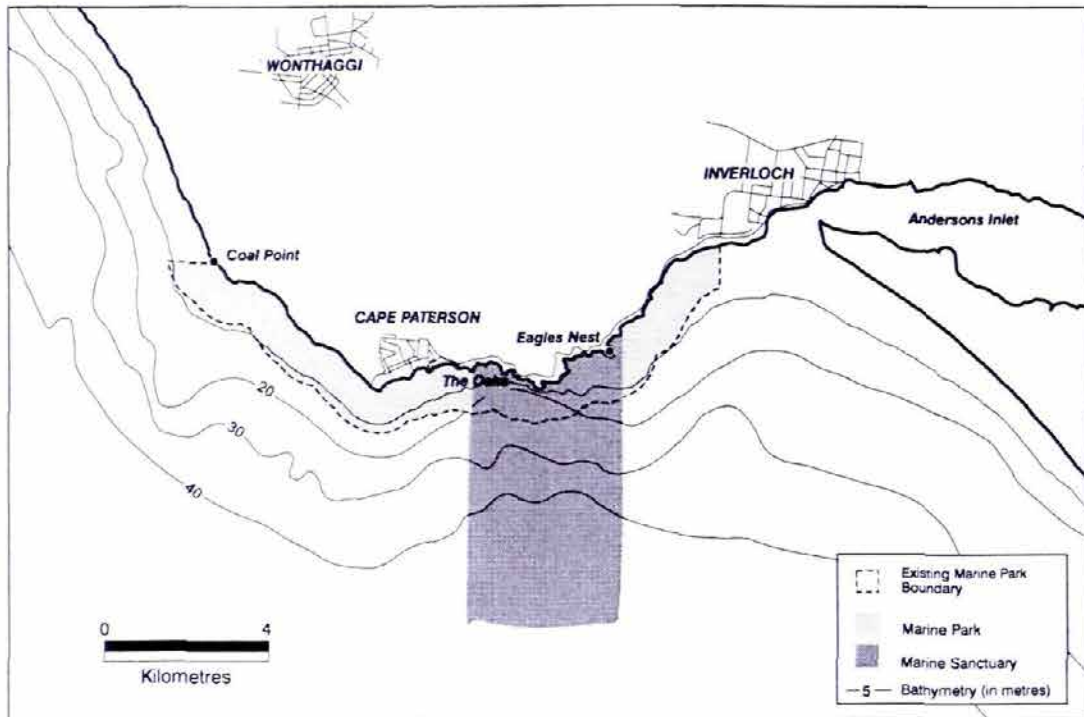
- A8** Bunurong Marine National Park
- A9** Wilsons Promontory Marine National Park
- A10** Ninety Mile Beach Marine National Park
- A11** Point Hicks Marine National Park
- A12** Cape Howe Marine National Park
- B9** Mushroom Reef Marine Sanctuary
- B11** Beware Reef Marine Sanctuary

- C1** Bunurong Marine Conservation Park
- C3** Wilsons Promontory Marine Conservation Park

- D14** Seal Rocks Marine Special Management Area
- D15** The Skerries Marine Special Management Area



A8 BUNURONG MARINE NATIONAL PARK



This Marine National Park is an extension of the existing well-known and popular Bunurong sanctuary zone. It is one of the most accessible marine parks, its striking rock formations admired and its beaches used by high numbers of visitors. A favourite activity is exploring the diverse marine life on the intertidal platforms and rockpools.

Location

- Located about 6 km south-west of Inverloch, includes the sanctuary zone of the existing Bunurong Marine Park.
- Extends along approximately 5 km of coastline from 2.5 km east of Cape Paterson to the eastern end of Eagles Nest Beach, and offshore for three nautical miles to the limit of Victorian waters.
- Approximately 2 200 hectares.

Representation

- One of two Marine National Parks, with Point Addis, proposed for the Central biophysical region of Victoria (IMCRA Central Victoria Region).
- The following habitats are represented in the park: sandy beaches, intertidal and sub-tidal rocky reefs, sub-tidal soft sediments.

(More general information on representation can be found in Part Two, sections 6.3 and 6.6 of this report.)

Environmental significance

- Extensive intertidal rock platforms, and subtidal rocky reefs, uncommon along the Victorian coast, which extend several kilometres from shore but which are in relatively shallow water. These platforms and reefs include numerous microhabitats.
- Various marine flora and fauna, including brown (eg *Cystophora* sp.) green and red algae, sponges and bryozoans and *Amphibolis* seagrass.
- Highest diversity of intertidal and shallow subtidal invertebrate fauna recorded in Victoria on sandstone. A high proportion of the common invertebrates occurring along Victorian coast: for example, seven of eight brittle stars, nine of 11 sea-cucumbers, eight of 11 barnacles, all five sea anemones, and 15 of 20 chitons.
- Eagles Nest provides habitat for breeding peregrine falcons and hooded plovers, and is a fossil dinosaur locality.
- The park adjoins a foreshore area consisting of dunes (in the west) and high cliffs (to the east) which support important remnant coastal and dune vegetation.



Implications for users

Recreation and tourism

- Popular area for diving, cliff top sightseeing, and beach activities. One of the most popular recreational activities is exploring rockpools.
- Shore access is excellent with roads and car parks at many sites.
- All fishing is currently prohibited, from the shore to 1 km offshore, in the sanctuary zone of the Bunurong Marine Park. Offshore boat-based recreational fishing is limited. The effect on recreational fishing of the recommended extension to the sanctuary zone will be minimal.
- There will be no restrictions on boating, diving, and other non-harvesting activities.

Commercial fishing

- Estimates of the value of commercial fishing are from MAFRI (1999a). The major commercial activity, rocklobster harvesting, is valued in 1996/97 at \$26 000 (or 1.3% of the 1996/97 Eastern Zone catch). Most abalone habitat is contained within the sanctuary zone of the existing Bunurong Marine Park, and has not been harvested since 1991. Other fishing activities amount, in 1996/97, to about \$6 000. The estimated total annual value of commercial fishing in 1996/97 is \$32 000.
- This recommended marine national park will have a relatively minor impact on commercial fishing because fishing has been excluded from the part of the area, to 1 km offshore, since 1991.

Consideration of alternative areas

- Other nearby areas that have been considered previously include Point Nepean, The Nobbies and Cape Liptrap. The recommended Bunurong Marine National Park has a lower impact on the fishing industry and other users than the alternatives.

Management and compliance issues

- Access to the park is excellent and a number of platforms have been constructed to allow viewing of picturesque beaches, cliffs and extensive rock platforms. The high visitor numbers require continuous management effort.
- The existing marine park is well accepted and supported by the community, thereby facilitating compliance.

Assessing effectiveness

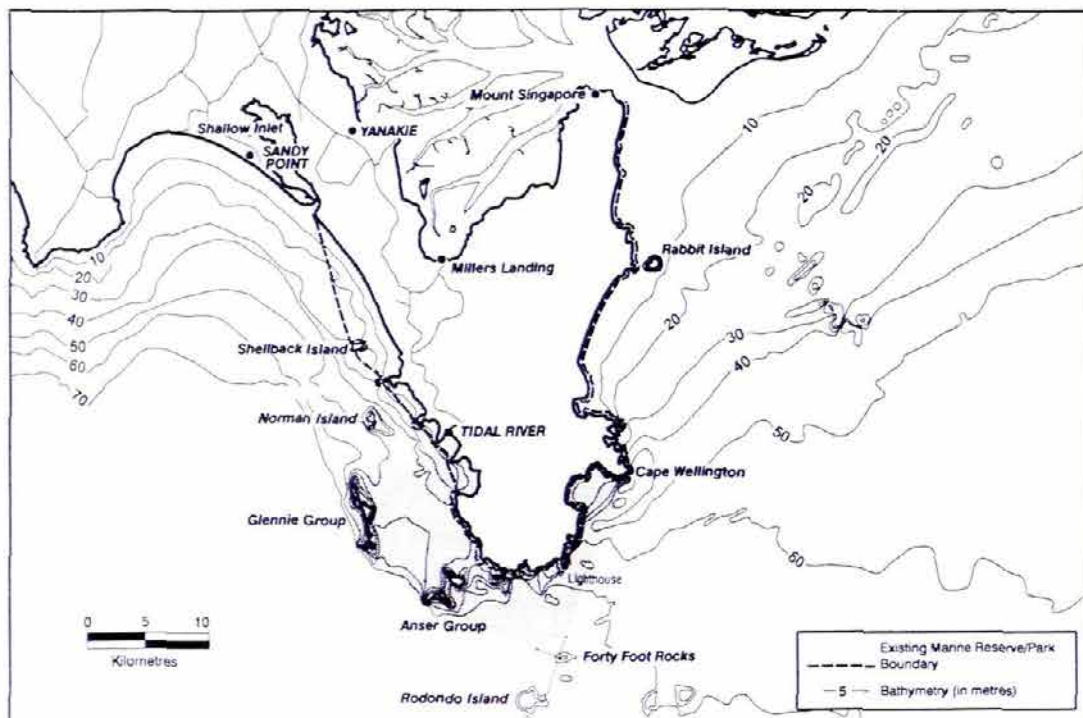
- Monitoring and assessment of the effectiveness of the park will be assisted by comparison with similar areas where activities such as fishing take place. *Cape Liptrap is one of the areas that could be included in a monitoring program.*
- Investigations are currently being undertaken to assess the effectiveness of the sanctuary zone that has been in place since 1991.
- There have been repeated claims that the existing sanctuary zone has been stripped of abalone by illegal poaching. Initial monitoring results, field inspection by ECC staff, and advice from Fisheries officers and Parks Victoria staff, show that these claims are simply untrue.

INFORMATION SOURCES

From all information used for this area, including extensive consultation, the following reference numbers contain site-specific data: **4, 22, 27, 29, 30, 31, 50 and 53.**



A9 WILSONS PROMONTORY MARINE NATIONAL PARK



This park, along with the Twelve Apostles, is one of two major new Marine National Parks recommended for Victorian waters, and is an extension of the existing marine reserve. It adjoins Wilsons Promontory National Park, including a number of the rugged and remote offshore granite islands.

Location

- Located around the southern tip of Wilsons Promontory adjoining Wilsons Promontory National Park, and includes the existing Wilsons Promontory Marine Reserve.
- Extends along the coastline from Norman Point in the west to Cape Wellington in the east, and offshore to the limit of Victorian waters, encompassing several islands.
- Approximately 17 530 hectares.

- Sub-tidal soft sediments consists of predominantly fine sand with some medium and coarse sand, silt and flat shell rubble, with a carbonate content of 2 to 60%.
- Significant seagrass beds in some sheltered bays.

(More general information on representation can be found in Part Two, sections 6.3 and 6.6 of this report.)

Representation

- The only Marine National Park proposed for the Wilsons Promontory biophysical region of Victoria (IMCRA Flinders Region).
- One of two large marine national parks proposed for Victoria.
- The following open coast habitat types are represented in the park: sandy beaches, intertidal and sub-tidal rocky reefs, and sub-tidal soft sediments.
- The granite habitats of this area are probably unique in Victorian marine waters, including extensive heavy reefs with smooth surfaces, boulders and rubble and low profile reefs.

Environmental significance

- Smooth walled granite cliffs plunging abruptly to the sea-floor, and sandy beaches sloping gradually to depths of 30 to 50 metres within 3 km offshore.
- Deep heavy reefs have a dense cover of epifauna, especially sponges, stalked ascidians and sea wips, and are abundant in fish, including butterfly and magpie perches, leatherjackets and morid cods.
- Soft sediment areas among offshore reefs with diverse biotic assemblages, eg at 80 m depth, off South East Point, extensive sponge gardens on flat shell rubble.
- Four species of seagrass: *Amphibolis antarctica* (eg Waterloo Bay), *Heterozostera tasmanica* (eg Oberon Bay), and *Halophila ovalis* (eg Waterloo Bay) and *Posidonia* (eg Great Glennie Island).



- Wilsons Promontory area forms the distribution limit for a number of species:
 - seagrass *Amphibolis antarctica* with its eastern distribution limit on the east side of the Promontory, intertidal molluscs *Notoacmea mayi* and *Austrocochlea odontis* common in western and central Victoria, but absent east of the Promontory, a brittle star *Ophionthrix spongicola* absent west of the Promontory;
 - a floristic discontinuity of some green algae such as *Caulerpa* spp. and brown algae including *Cystophora*;
 - number of fish species have their distributional limit at Wilsons Promontory.
 It is possible that these differences are due to dramatic sea-level fluctuations in the Pleistocene era that, at times of low sea level, kept Bass Strait above sea level.
- A number of islands are used for breeding by Australian fur-seals and many oceanic birds, including little penguins, short-tailed shearwaters, fairy prions, silver gulls and Pacific gulls. Kanowna Island is one of the four breeding colonies of Australian fur seal in Victoria.
- Some of Victoria's most spectacular underwater scenery is documented in the descriptions of 34 diving sites⁴⁸, due largely to the near vertical granite 'dropoffs', and the frequent high clarity of water, particularly on the western coastline.

Implications for users

Recreation and tourism

- The area is popular for diving. Part of the coastline adjacent to the proposed park is used for sightseeing, general beach activities and coastal bushwalking.
- There will be no restrictions on boating, diving, and other non-harvesting activities.
- All forms of recreational fishing are currently prohibited to 300m offshore. Limited boat-based recreational fishing occurs outside this area.
- The effect of the recommended park on recreational fishing is likely to be limited due to the current restrictions, the remoteness of the area, and the availability of alternative areas.

Commercial fishing

- Estimates of the value of commercial fishing are from MAFRI (1999a). The major commercial activity is abalone harvesting valued, in 1996/97, at \$944 000 (or 4.5% of the 1996/97 Central Zone catch). The rock lobster catch is valued, in 1996/97, at \$28 000 (or 1.6% of the 1996/97 Eastern Zone catch). Other fishing activities include mesh netting amounting to about \$167 000 in 1996/97. The estimated total value of commercial fishing in 1996/97 is \$1 139 000.

Consideration of alternative areas

- This is an extension to the existing Wilsons Promontory Marine Reserve, established in 1986.
- Alternative proposals were submitted to Council by a Working Group made up of commercial and recreational fishers, business and tourism interests. Council has assessed these proposals, which involved a small fully protected area at Leonard Point at Wilsons Promontory, and a fully protected area near the Hogan Group about 40 km ESE of the southern tip of the Promontory. It was considered that these proposals did not include the range of environments in the region, and also failed to meet the adequacy criterion in terms of size and replication.
- Other areas that have been considered previously include Shellback Island and Cape Liptrap.

Management and compliance issues

- The proposed park is not readily accessible, although relative to its location has a large number of visitors. Abalone theft is a serious issue.
- The existing marine reserve and marine park at Wilsons Promontory are managed together with the terrestrial national park. Education and visitor materials about marine and terrestrial parks are available through the interpretation centre at Tidal River.

Assessing effectiveness

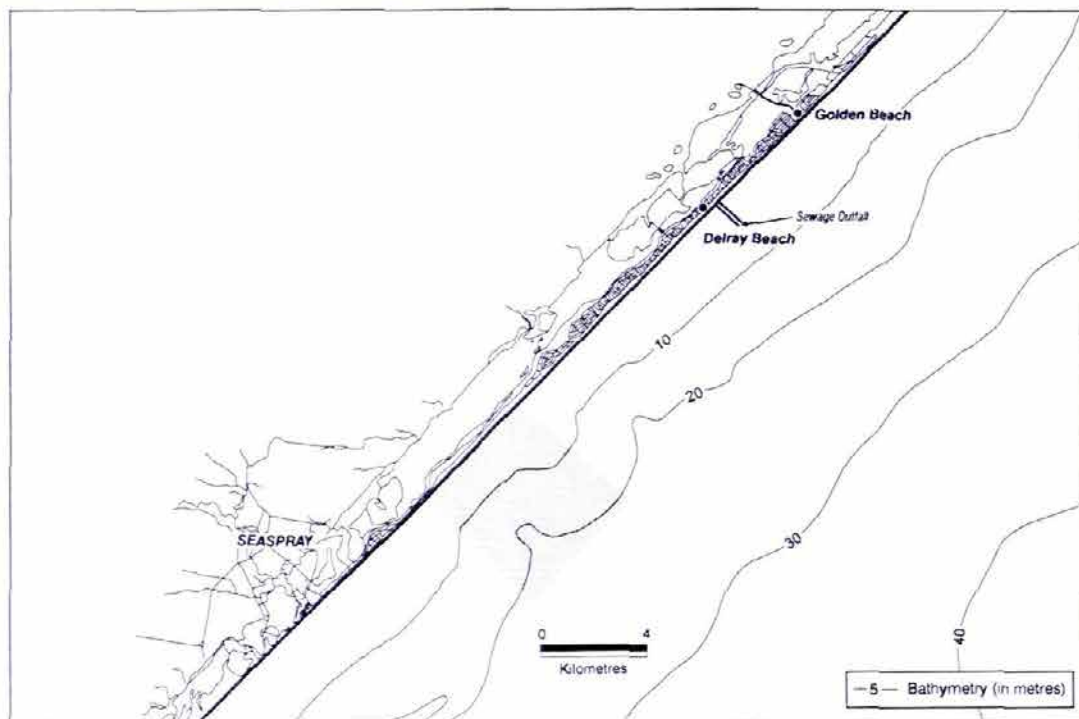
- Monitoring and assessment of the effectiveness of the park will be assisted by comparison with similar areas where activities such as fishing take place. Areas which could be included in a monitoring program are any sections of the Wilsons Promontory coast north of the proposed area.

INFORMATION SOURCES

From all information used for this area, including extensive consultation, the following reference numbers contain site-specific data: 4, 18, 22, 27, 30, 48, 49, 50 and 51.



A10 NINETY MILE BEACH MARINE NATIONAL PARK



The recommended park captures typical marine habitats in Victoria's well-known Ninety Mile Beach area, including scientifically significant low profile offshore reefs. The park has been located to minimise impacts on fishing along this popular coastline.

Location

- Located about 30 km south of Sale between Seaspray and Golden Beach, and adjacent to Gippsland Lakes Coastal Park.
- Extends along approximately 5 km of coastline between Seaspray and Delray Beach, and offshore for three nautical miles to the limit of Victorian waters.
- Approximately 2 863 hectares.

Representation

- One of three Marine National Parks, with Point Hicks and Cape Howe, proposed for the Eastern biophysical region of Victoria (IMCRA Twofold Shelf Region).
- The following open coast habitat types are represented in the park: sandy beaches, sub-tidal rocky reefs and sub-tidal soft sediments.
- The rocky habitats of this area include patchy low profile, calcarenite reefs (from a few centimetres to a metre high). The lowest lying reefs can be covered and uncovered periodically by sand, driven by very strong, tidal currents (2 to 2.5 knots) characteristic of this area. Reefs cover about 20% of the area, are flat topped with occasional small ledges and crevices. The reef area extends from 1 to 4 km (and possibly further) offshore, at depths of 5 to 20m.

- Sub-tidal soft sediments consist of a mixture of fine and medium sand with some silt, gravelly sand and shell, with a carbonate content of 14 to 19%.

(More general information on representation can be found in Part Two, sections 6.3 and 6.6 of this report.)

Environmental significance

- Reefs are dominated by invertebrates (70% coverage) and have sparse floral communities. Large kelps are absent and only small red algae are visible.
- Invertebrates include sponges and ascidians, and smaller bryozoans and hydroids. Clumps of ascidians (mainly *Pyura stolonifera*) also occur on sand between reefs.
- *Coscinasterias muricata*, a large endemic southern Australian seastar, occurs here in large numbers, although its usual prey of mussels, abalone and scallops is absent.
- *Pseudogorgia godeffroyi*, an unusual soft coral is only found in Victoria between McGuarans and Delray beaches.
- The low relief reefs may be remnants of dune systems that formed when sea-levels were lower. This is supported by the presence, between some reefs, of mud containing fossils.



- There is a good evidence of aggregations of young white sharks indicating this area to be their feeding grounds; snapper (likely food of sharks) are also known to feed here.

Implications for users

Recreation and tourism

- The whole of this coastline is popular for recreational surf-fishing and beach activities.
- Charter boat operators offering boat-based recreational fishing for shark, pike and snapper are increasing in popularity, as is other boat-based recreational fishing.
- The area from Seaspray to Paradise Beach is used for a popular annual fishing competition festival.
- On balance, the recommended park should have a minor overall effect on recreational fishing in the region, given the ready accessibility of much of this coastline. This site has been recommended to minimise the overall impact on the local communities.
- There will be no restrictions on boating, diving, and other non-harvesting activities.

Commercial fishing

- The major commercial activity - trawling - occurs along the entire length of the Ninety Mile Beach. The proposed park includes only a very small part of these fishing grounds.
- Although estimates are not yet available, the value of commercial fishing in the proposed park is probably relatively low. The overall impact of the proposed park is likely to be minor, given the large alternative areas available. The presence of low reef reduces the netting effort in the area.

Petroleum exploration and extraction

- The recommended park is near the oil and gas fields of the Gippsland Basin. All the current production comes from offshore platforms outside Victorian waters. Oil and gas pipelines will be allowed subject to an Environment Effects Statement process, as for terrestrial national parks.
- Oil and gas exploration that does not disturb the seabed and biota will be allowed, but exploratory drilling and extraction will not be permitted in marine national parks.

Management and compliance issues

- The proposed park is readily accessible from a road running parallel to the coast. Boat access is generally limited.

Assessing effectiveness

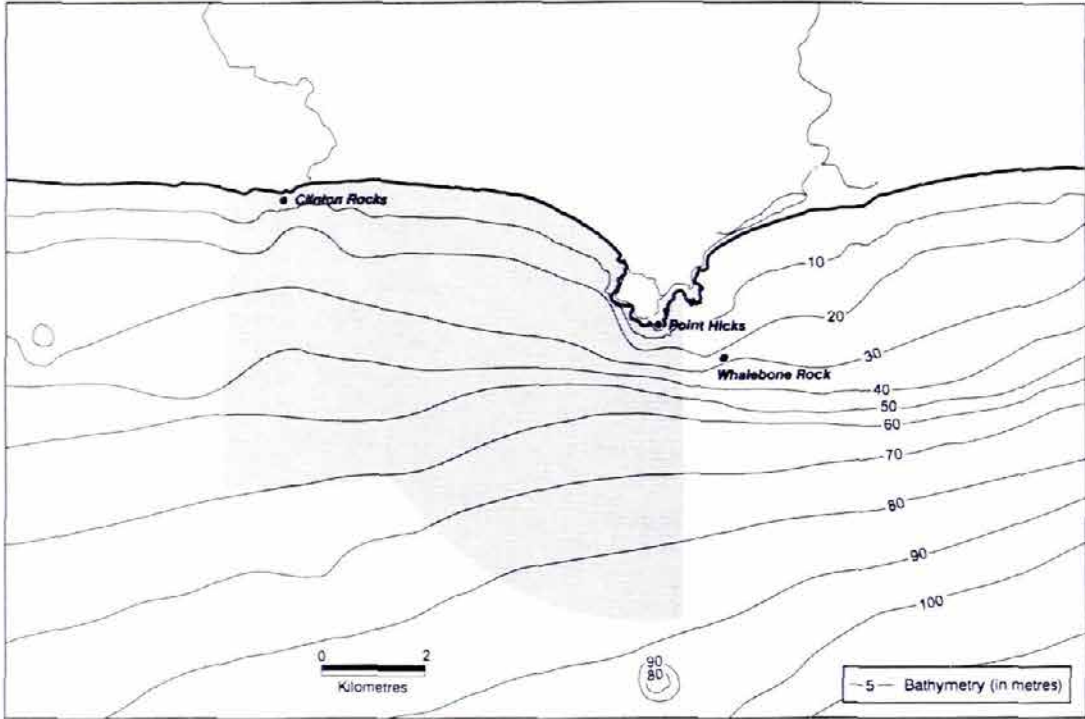
- Monitoring and assessment of the effectiveness of the park will be assisted by comparison with similar areas where activities such as fishing take place. Possible areas for comparison are near Seaspray, and west of Golden Beach.

INFORMATION SOURCES

From all information used for this area, including extensive consultation, the following reference numbers contain site-specific data: **27 and 52.**



A11 POINT HICKS MARINE NATIONAL PARK



Point Hicks was the first point on the coast seen in 1770 from Captain Cook’s ship Endeavour. This recommended park adjoins the major granite outcrop and spectacular lighthouse of Point Hicks, part of Croajingolong National Park. The rich marine life of the area, with its colourful algae and diverse reef fish, provide excellent opportunities for diving and snorkelling.

Location

- Located about 25 km south-east of Cann River, and adjacent to Croajingolong National Park.
- Extends along approximately 10 km of coastline from Clinton Rocks to Point Hicks, and offshore for three nautical miles to the limit of Victorian waters.
- Approximately 5 800 hectares.

Representation

- One of three Marine National Parks, with Cape Howe and Ninety Mile Beach, proposed for the Eastern biophysical region of Victoria (IMCRA Twofold Shelf Region).
- The following open coast habitat types are represented in the park: sandy beaches, intertidal and sub-tidal rocky reefs, and sub-tidal soft sediments.
- The rocky habitats of this area have varied forms from large boulders rising to 6 metres to clusters of smaller rocks and stones.

- Sub-tidal soft sediments consist of a mixture of fine, medium and coarse sand with some silt, pebbles and shell, with a carbonate content of 8 to 13%.

(More general information on representation can be found in Part Two, sections 6.3 and 6.6 of this report.)

Environmental significance

- Very high total species richness of fauna, including intertidal and shallow sub-tidal invertebrates. A survey of the reef just outside the park boundary had more species than from anywhere else on the Victorian coast. It is likely that similar species richness occurs within the reefs in the proposed park.
- Plentiful and beautiful marine flora and fauna, including spectacular subtidal reefs with colourful and diverse sessile invertebrates.
- Kelps including *Ecklonia* and *Phyllospora* and small algae.



Implications for users

Recreation and tourism

- The general area is popular for recreational fishing, snorkelling and diving due to the rich and colourful marine life and the variety of reef fishes.
- The Point Hicks Lighthouse Reserve and two camping areas, at the mouths of the Thurra and Mueller Rivers east of the proposed park, provide a focus for walking and sightseeing. Accommodation is provided at the lighthouse.
- The potential increase of visitors to Point Hicks Lighthouse Reserve and the two camping areas at the mouths of the Thurra and Mueller Rivers may provide considerable potential for marine and land based interpretation programs.
- For recreational fishing, the effect of the proposed park should be limited. The most popular recreational fishing areas on the beach east of Point Hicks, and the accessible rock fishing areas on the east side of the point, are not included in the proposed park.
- There will be no restrictions on boating, diving, and other non-harvesting activities.

Commercial fishing

- Estimates of the value of commercial fishing are adjusted from MAFRI (1999a). The major commercial activity, abalone harvesting, is valued in 1996/97 at approximately \$484 000 (or 3.6% of the 1996/97 Eastern Zone catch). The rock lobster catch amounts, in 1996/97, to less than \$23 000 (or less than 1.3% of the 1996/97 Eastern Zone catch). Other fishing activities, include mainly mesh netting, are valued, in 1996/97, at \$42 000. The estimated total value of commercial fishing in 1996/97 is \$549 000.
- The impacts on commercial fishing of this recommended park have been substantially reduced by excluding from the park major commercial abalone reefs immediately to the east of Point Hicks.

Consideration of alternative areas

- Other areas that have been considered previously include areas around or near Cape Conran, Petrel Point, Rame Head, The Skerries, Little Rame Head, and Sandpatch Point.
- The most recent alternative proposal was submitted by a Working Group made up of commercial and recreational fishers, business and tourism interests who suggested a small marine national park at Clinton Rocks. Council's assessment was that the proposal did not comprehensively sample the range of marine habitats in the region, and that it also failed to meet the adequacy criterion in terms of size and replication, but together with part of the Point Hicks area, it was a viable proposal.

Management and compliance issues

- The proposed park is readily accessible from the shore, with good road access to the park available from Cann River, a one-hour drive away. Two camping areas, at the mouths of the Thurra and Mueller Rivers, east of the park provide a focus for day visitor use.

Assessing effectiveness

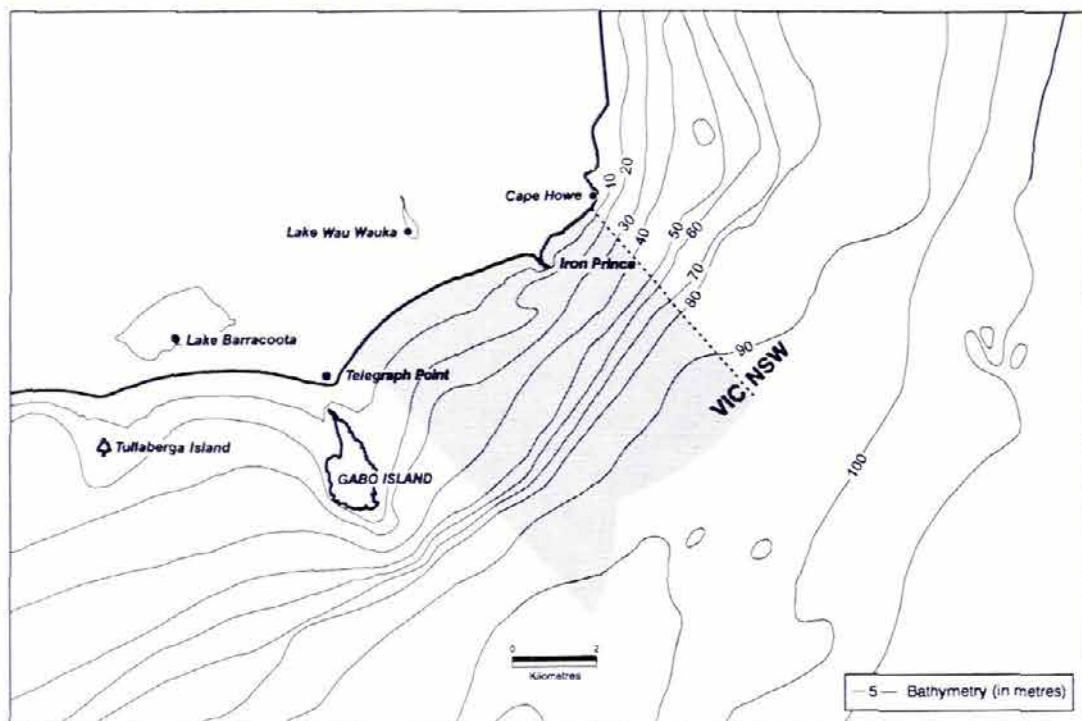
- Monitoring and assessment of the effectiveness of the park will be assisted by comparison with similar areas where activities such as fishing take place. Areas which could be included in a monitoring program are Petrel Point, Rame Head, Skerries, Little Rame Head, Sandpatch Point, Cape Conran and areas to the east of Point Hicks excluded from the park.

INFORMATION SOURCES

From all information used for this area, including extensive consultation, the following reference numbers contain site-specific data: **4, 17, 22, 27, 29 and 30.**



A12 CAPE HOWE MARINE NATIONAL PARK



This recommended park is the most remote in the State, and adjoins one of only two wilderness areas on Victoria's coast.

Location

- Located about 15 km east of Mallacoota, and adjacent to Croajingolong National Park.
- Extends along approximately 7 km of coastline from 2 km east of Gabo Island to the New South Wales border, and offshore for three nautical miles to the limit of Victorian waters.
- Approximately 4 226 hectares.

Representation

- One of three Marine National Parks, with Point Hicks and Ninety Mile Beach, proposed for the Eastern biophysical region of Victoria (IMCRA Twofold Shelf Region).
- The following open coast habitat types are represented in the park: sandy beaches, intertidal and sub-tidal rocky reefs, and sub-tidal soft sediments.
- The rocky habitats of this area have complex forms/structure, including low profile reef eroded into pits and gutters, and heavy boulder reef with gutters and ridges up to 3 metres high.
- Sub-tidal soft sediments consist of a mixture of fine and medium sand with some silt, shell and worm tubes, with a carbonate content of 6 to 10%.

(More general information on representation can be found in Part Two, sections 6.3 and 6.6 of this report.)

Environmental significance

- High diversity of intertidal and shallow sub-tidal invertebrates.
- Many species from warmer northern waters reach their southern limits in far east Gippsland.
- Variety of reefs including granite and sandstone reefs adding to the total substrate complexity of the area. Sandstone reefs observed in the park to about 50 metres depth heavily covered by a diverse array of sponges, hydroids, ascidians and gorgonians.
- Croajingolong National Park, together with NSW's Nadgee Nature Reserve, is part of the largest coastal conservation reserve on the south-eastern Australian mainland. The proposed Marine National Park is adjacent to the Cape Howe Wilderness Area.



Implications for users

Recreation and tourism

- The area is used for boat-based recreational fishing, although boating access from Mallacoota Inlet to offshore waters is sometimes difficult. Most boat-based fishing takes place west of Gabo Island but waters east of Gabo Island are also used depending on weather conditions.
- Effects on recreational fishing have been minimised by not including the sheltered waters around Gabo Island in the park.
- The adjacent mainland is a spectacular coastline for remote bushwalking.
- There will be no restrictions on boating, diving, and other non-harvesting activities.
- Development of a new boat launching facility at Mallacoota has been under discussion for some time. This will markedly improve access to the park and the adjoining fishing grounds, and has the potential to give a major boost to tourism in the town.

Commercial fishing

- Estimates of value of commercial fishing are from MAFRI (1999a). The major commercial activity, abalone harvesting, is valued, in 1996/97, at \$590 000 (or 4.3% of the 1996/97 Eastern Zone catch). Commercial rock lobster catch is minor amounting, in 1996/97, to approximately \$2 000. Other fishing activities include mesh netting, haul, purse and Danish seining amounting, in 1996/97, to about \$99 000. A developmental fishery for sea urchins utilises reefs in these waters. Estimated total value of commercial fishing in 1996/97 is \$691 000.
- The impact on commercial fishing has been minimised by not including the waters around Gabo Island in the proposal, although their environmental values are very high.

Consideration of alternative areas

- Other areas that have been considered previously include areas around or near Petrel Point, Rame Head, The Skerries, Little Rame Head and Sandpatch Point.

Management and compliance issues

- The proposed park is not readily accessible, is remote from vehicle access, and borders NSW waters. Abalone theft is a serious issue, which must be addressed cooperatively with NSW authorities.
- A contiguous NSW park would facilitate management. Discussions have been initiated with NSW agencies.

Assessing effectiveness

- Monitoring and assessment on the effectiveness of the park will be assisted by comparison with similar areas where activities such as fishing take place. Areas which could be included in a monitoring program are Petrel Point, Rame Head, Skerries, Little Rame Head and Sandpatch Point.

INFORMATION SOURCES

From all information used for this area, including extensive consultation, the following reference numbers contain site-specific data: **4, 17, 22, 29 and 30.**



Marine Sanctuaries

B9 Mushroom Reef Marine Sanctuary

This 74 ha site at Flinders, along with Honeysuckle Reef at Shoreham, supports the most diverse intertidal rocky reef communities known in Victoria⁴. The area is easily accessible, and is valued for underwater recreation and the potential educational role that it can play.

Mushroom Reef is an exposed ocean area containing numerous subtidal pools and boulders in the intertidal area. The high substrate complexity of the intertidal basalt substrates provides a rich variety of microhabitats. The subtidal reefs are popular for diving, snorkelling and novice spearfishing. A decline in intertidal invertebrates on the reef has been noted in recent years despite protection by the Shellfish Protection Regulations. The site has high conservation and educational value, the latter arising from the area's proximity to large population centres. The proposed sanctuary does not include that part of the Flinders Back Beach reef that is used by commercial abalone divers.

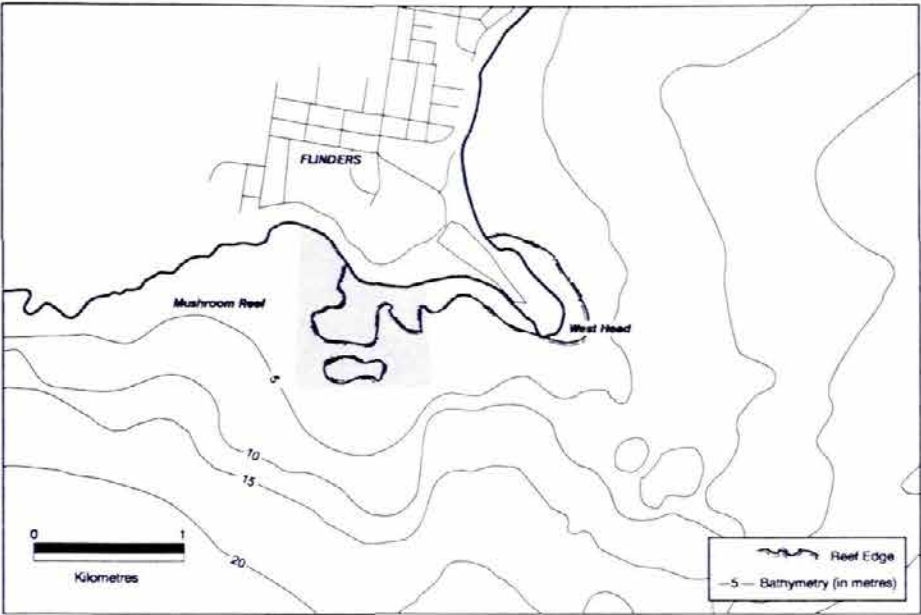
B11 Beware Reef Marine Sanctuary

This 218 ha site lies to the south east of Cape Conran and is considered by some to provide some of the most beautiful reef diving in the State. The area complements the marine national parks in the Eastern Region, by adding an offshore granite reef to the habitats represented in the other parks.

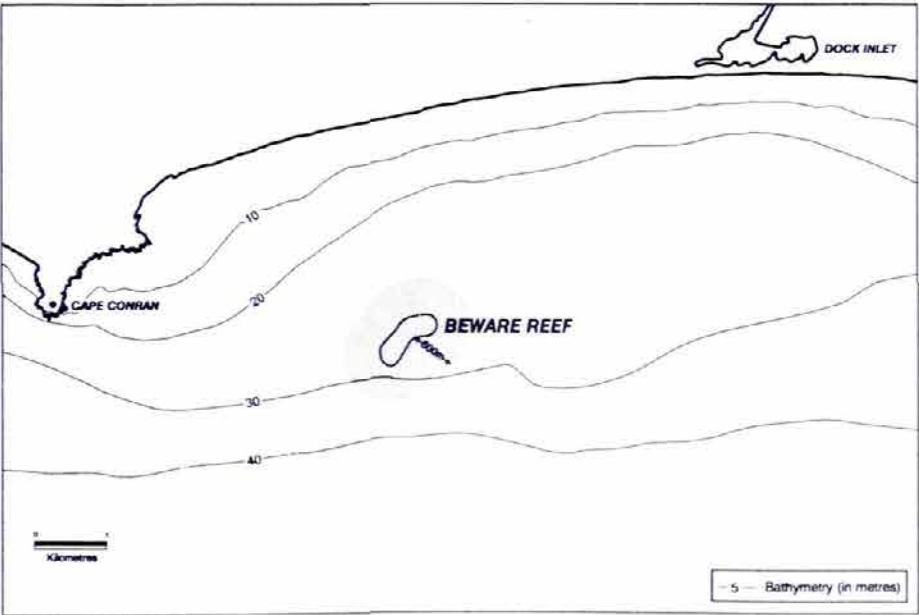
A diversity of corals, sponges, sea anemones, gorgonians, zoanthids, crynoids and other invertebrates have been recorded, with over 20 species of reef fish present. The granite reef also has forests of bull kelp and shipwreck remains. The reef is currently available to commercial abalone divers, but it is believed that it contributes a relatively small part of the total catch of the zone.



B9 Mushroom Reef Marine Sanctuary

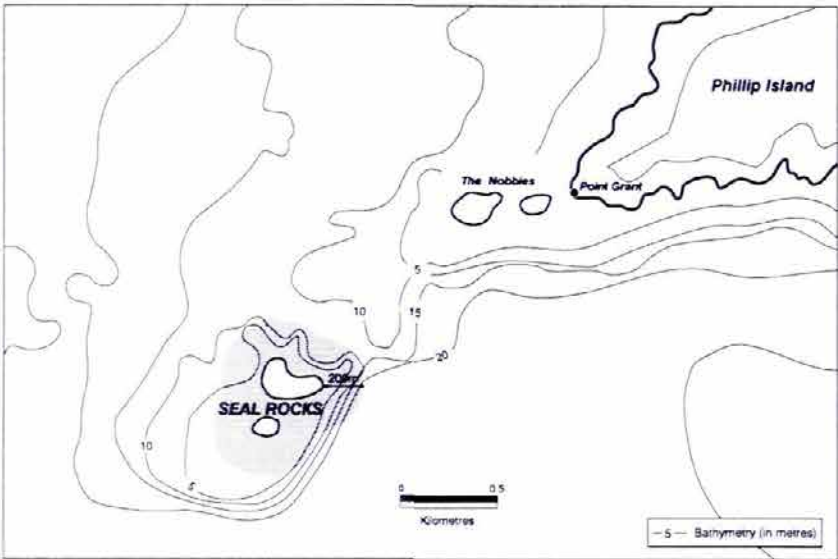


B11 Beware Reef Marine Sanctuary



**D14 Seal Rocks (Phillip Island)
Marine Special Management Area**

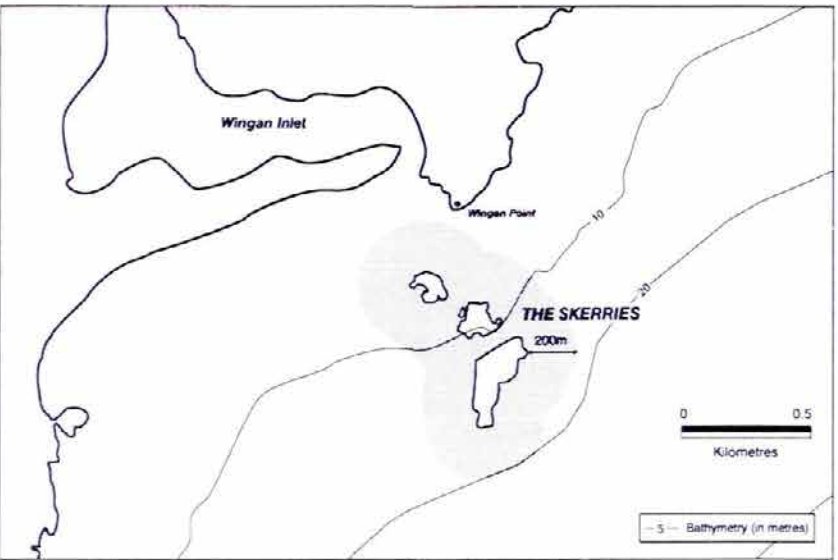
This 38 ha area is recommended to complement management of Seal Rocks, which is the largest breeding colony of Australian fur seals in the world. It is also the only Victorian breeding site of the kelp gull and is a breeding site for the sooty oyster catcher. Seal Rocks are exposed basalt rocks, and the surrounding waters are rich in marine life, including white pointer sharks. In keeping with management prescriptions for waters adjacent to other seal breeding areas, use of rock lobster pots, nets and line fishing should be prohibited within the boundaries of the marine special management area (a distance of 200 metres from the rocks). Disturbance of the colony should be discouraged especially during their breeding season, which is typically between mid October and late



December. Managers should ensure that vessel access is appropriately regulated within the marine special management area.

D15 The Skerries Marine Special Management Area

This 49 ha area is recommended to complement management of the Skerries, one of four breeding sites in Victoria of the Australian fur seal. The Skerries are a granite outcrop found opposite Wingan Inlet and are part of the Croajingolong National Park. They are also known as a significant breeding site for the crested tern and as a roosting site for the black faced shag. Commercial harvesting of abalone is carried out on the sub-tidal reefs surrounding the Skerries. In keeping with management prescriptions for other seal breeding areas, use of rock lobster pots, nets and line fishing should be prohibited within 200 metres of the marine special management area. Disturbance of the colony should be discouraged especially during their breeding season, which is typically between mid October and late December.



Managers should ensure that vessel access is appropriately regulated within the marine special management area.



Recommendations for Marine Aquaculture

Marine aquaculture

This part sets out the recommendations for marine aquaculture zones and investigation areas for Victoria.

The majority of recommended areas are in bays and inlets, reflecting the difficulty of selecting suitable sites for marine aquaculture on Victoria's high-energy open coast. One investigation area has been recommended in western Victoria at Portland, and one aquaculture zone is proposed in eastern Victoria at Waratah Bay.

It should be noted that applications are continuing to be processed and approved, under existing processes, for marine aquaculture in areas additional to those proposed in this report.

This part of the report gives descriptions of the recommended Aquaculture Zones and Aquaculture Investigation Areas. See section 7 in Part Two of this report for an overview of the recommendations for marine aquaculture and definitions of aquaculture zones and investigation areas.

Note that in February 1998, the ECC provided an Interim Report to the then Minister with final recommendations for aquaculture zones at Avalon (land based) and Pinnacle Channel (marine). These recommendations are still under consideration by Government.

Recommended Areas

- | | |
|-----------|--|
| E1 | Grassy Point Aquaculture Zone |
| E2 | Clifton Springs Aquaculture Zone |
| E3 | Bates Point Aquaculture Zone |
| E4 | Beaumaris Aquaculture Zone |
| E5 | Mount Martha Aquaculture Zone |
| E6 | Dromana Aquaculture Zone |
| E7 | Flinders Aquaculture Zone |
| E8 | Waratah Bay Aquaculture Zone |
| | |
| F1 | Portland Aquaculture Investigation Area |
| F2 | Pt Lillias Aquaculture Investigation Area (land-based) |
| F3 | Kirk Point-Werribee Aquaculture Investigation Area |
| F4 | Corinella Aquaculture Investigation Area |
| F5 | Bass River Aquaculture Investigation Area |
| F6 | Anderson Inlet Aquaculture Investigation Area |
| F7 | Corner Inlet Aquaculture Investigation Area |

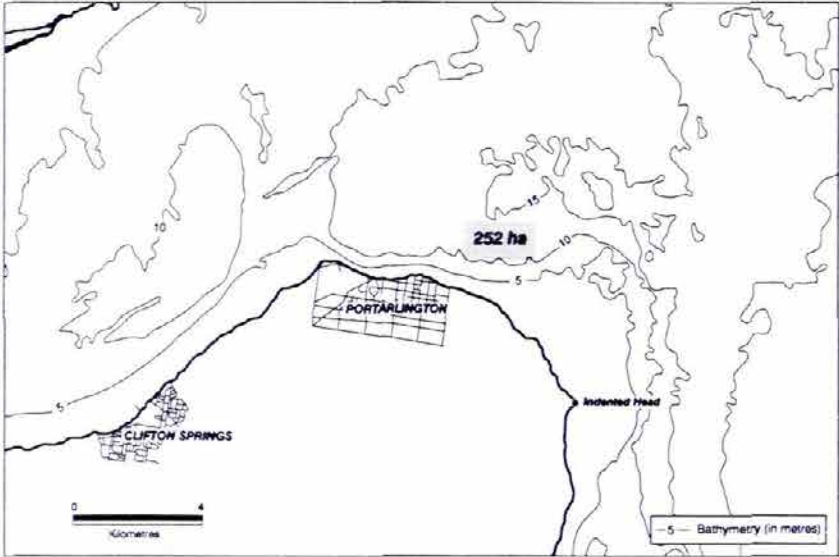


Aquaculture Zones

E1 Grassy Point Aquaculture Zone

This zone is an existing licence area where mussels have been grown successfully for many years. It is recommended that the existing zone be extended from 239 ha to 252 ha through the addition of an additional row to the northern edge of the licence area.

The diatom, which causes a bitter taste in mussels, blooms in association with cold water temperatures, and has from time to time been a particular problem at this site. The Pinnacle Channel area recommended as a Marine Aquaculture Area in the ECC's Interim Report (1998) is not subject to blooms and could be used as an area to cleanse the "bitter taste" diatoms from mussels grown at Clifton Springs and elsewhere in Port Phillip Bay.

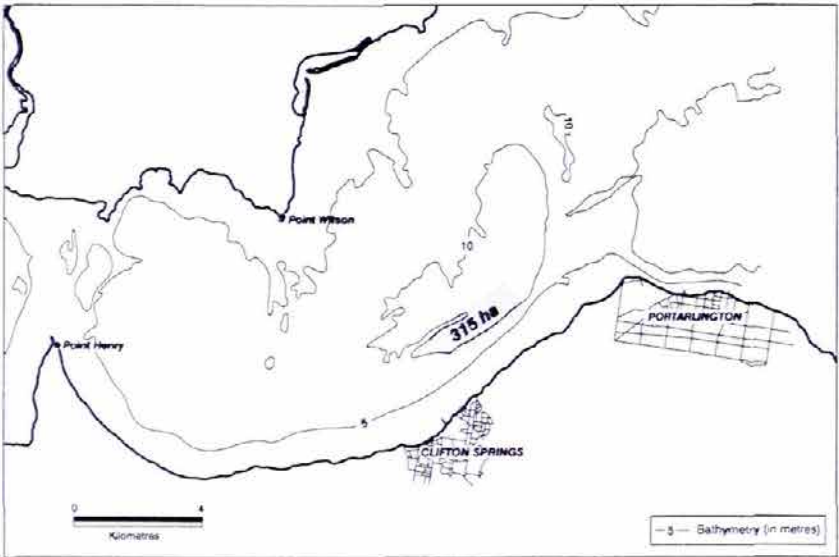


E2 Clifton Springs Aquaculture Zone

Clifton Springs has been a mussel production site since 1979. Some experimental production of abalone, scallops and flat oysters also occurs.

This zone is adjacent to significant seagrass beds. Provided mussel ropes do not directly overhang seagrass, there are unlikely to be detrimental impacts on seagrass communities.

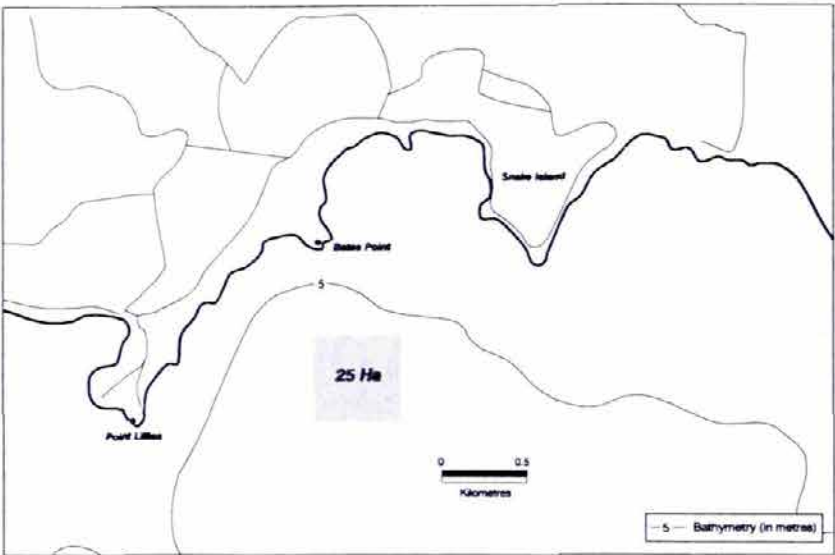
Algal blooms of the "bitter taste" diatom occur here, as at Grassy Point. Again the Pinnacle Channel area has the potential to minimise this problem.



E3 Bates Point Aquaculture Zone

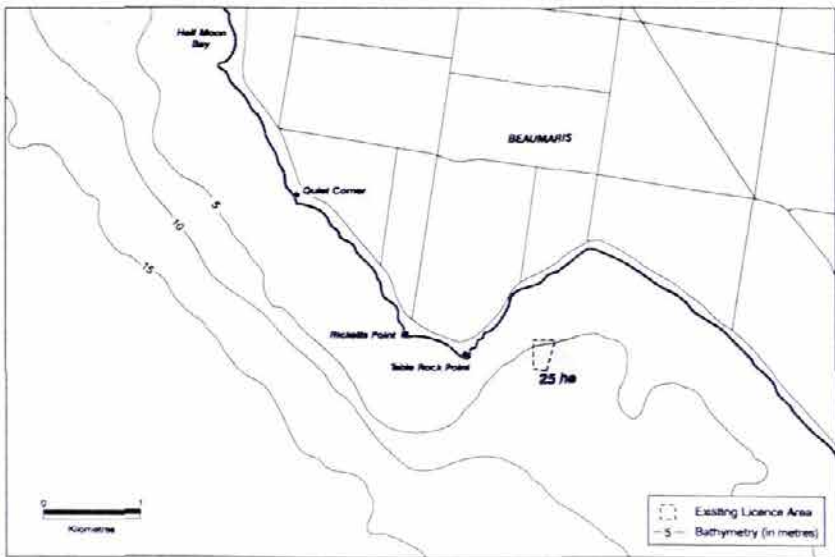
The recommended 25 ha area can be used as a holding facility for harvested product from other aquaculture areas, or as a nursery. In a nursery situation product would be ongrown from “seed” provided by hatcheries (eg flat oysters). Juveniles would then be grown to maturity in a land-based facility.

This aquaculture zone is intended to complement the adjacent land-based aquaculture zone. Another possible use is for the growing out of fingerling trout as “ocean trout”.



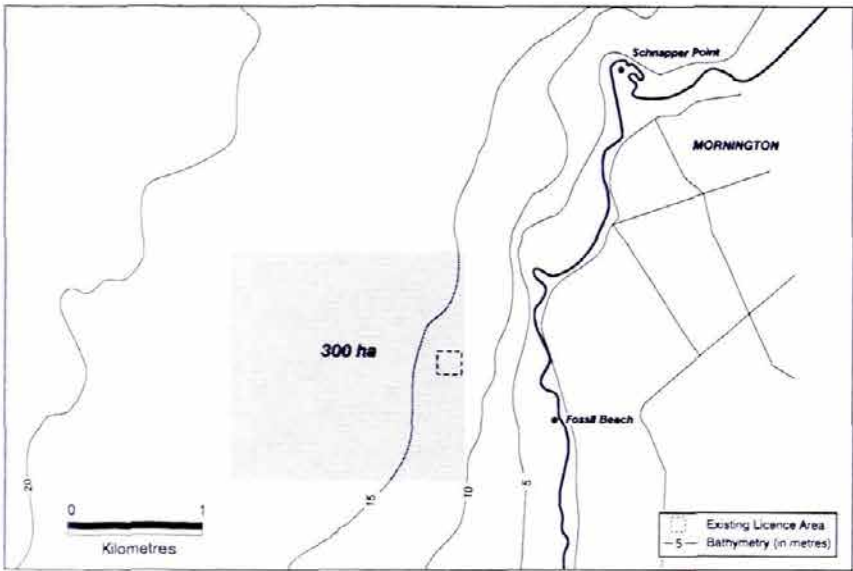
E4 Beaumaris Aquaculture Zone

This recommended zone is an existing lease area where mussels have been grown successfully for many years. It is recommended to expand the existing area from 6 ha to 25 ha.



E5 Mount Martha Aquaculture Zone

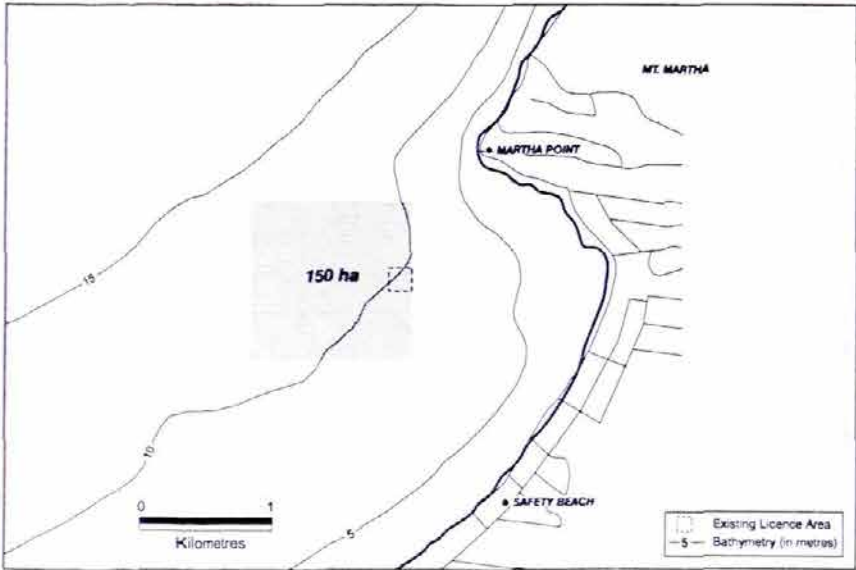
This recommended zone includes a small existing licence area where mussels have been grown. It is recommended to expand the current area from 3 ha to 300 ha.



E6 Dromana Aquaculture Zone

This recommended zone includes a small existing area where shellfish are grown. It is recommended to expand the current area from 3 ha to 150 ha.

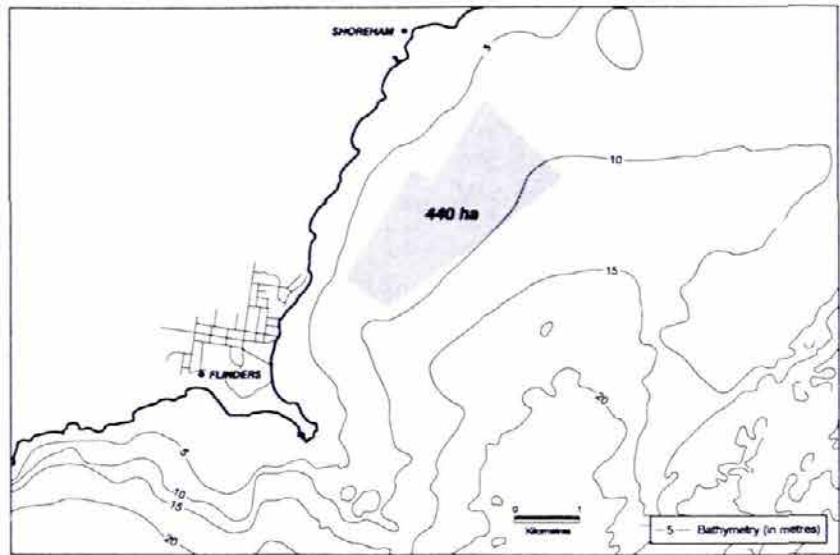
An inland marina development has been proposed at Brokil Creek to the east of the site. The aquaculture zone is located one kilometre from the Brokil Creek/Tassel Drain mouth and is unlikely to impact on potential boat traffic from such a development.



E7 Flinders Aquaculture Zone

This site is an existing aquaculture licence area of 400 ha. Mussels are currently being grown on 17 (of the existing 25) three hectare leases with abalone being grown on the remaining eight leases. It is recommended to expand the existing area to 440 ha. Recommended expansion of the area involves removing two rows from the north-western section, because they are too shallow and subject to excessive wave action, and adding two full rows to the deeper eastern side.

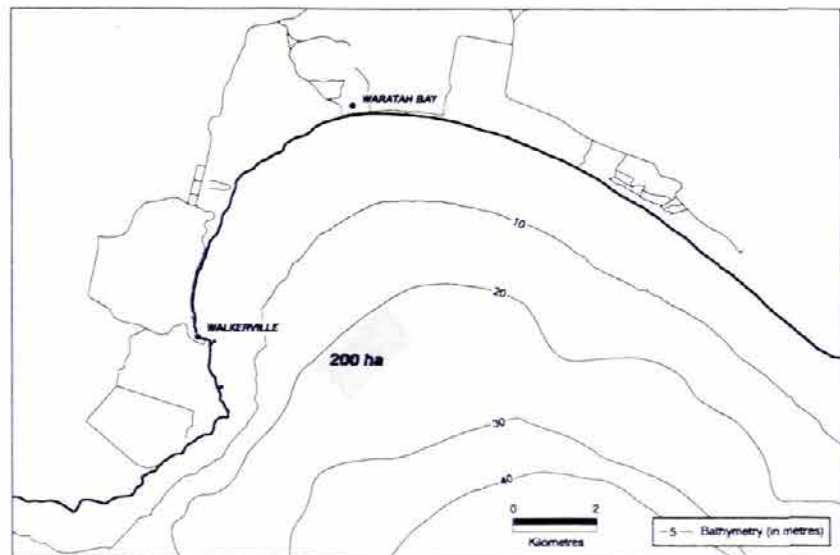
Mussels are currently translocated here from Port Phillip Bay aquaculture licence areas to cleanse the “bitter taste” diatoms.



E8 Waratah Bay Aquaculture Zone

The recommended 200 ha zone is suitable for aquaculture of finfish.

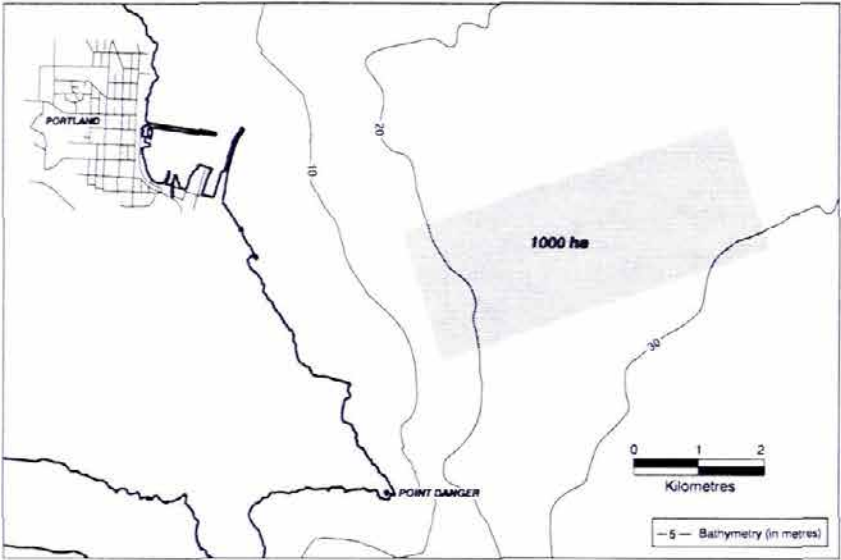
Waratah Bay is bordered by the Walkerville and Waratah Bay settlements. Both settlements have a significant retiree, tourist and holiday home-owning population. The recommended location is far enough offshore to have minimal impact on the natural values of the area. The location and design of onshore facilities would need careful consideration by local government to also protect onshore values.



Aquaculture Investigation Areas

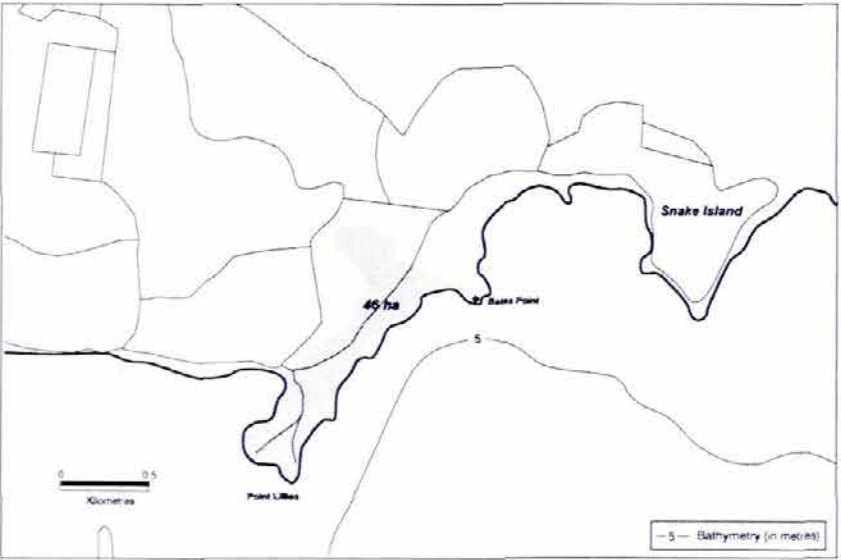
F1 Portland Aquaculture Investigation Area

This 1 000 ha area off Portland would be suitable for finfish. The area overlies low profile reef consisting of rubble interspersed with sand. Further investigation will determine whether sufficient sandy areas exist free of rubbly reef to enable an aquaculture zone to be designated. Any potential aquaculture zones would be appropriately marked and should not present a shipping hazard.



F2 Pt Lillias Aquaculture Investigation Area (land-based)

The natural values of this 46 ha investigation area were intensively studied as part of the Environment Effects Study (EES) for the proposed relocation of the Coode Island chemical storage complex. This area is part of a large area on the western side of Port Phillip Bay designated as a Wetland of International Importance under the Ramsar Convention. A report commissioned by NRE classified the area included in this recommendation as not having values for waterbird habitat at a regional or higher level. The State Government decided against the proposal for a chemical storage facility largely on economic grounds. The Environment Effects Study also indicated that while the actual site values are relatively low, the values of adjoining areas are very high (including some areas of international significance).



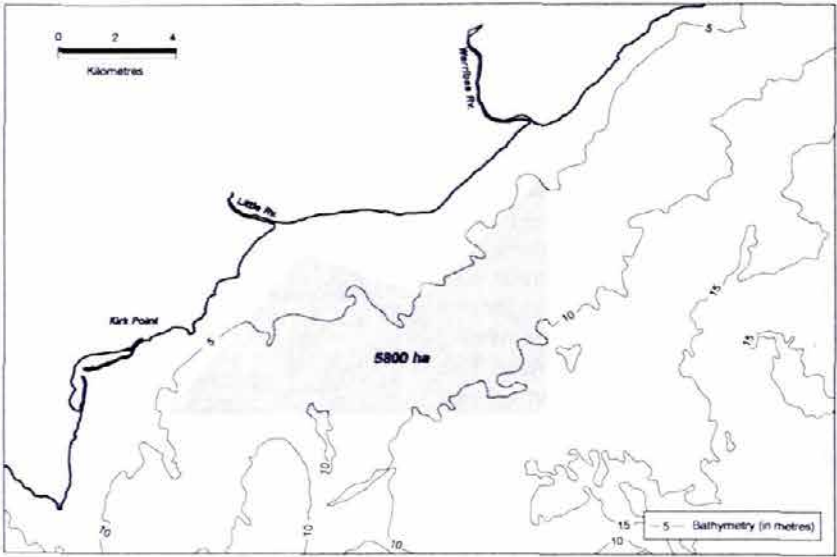
A detailed management plan for the area will be required to ensure that the Ramsar and other values are protected. The management plan should include a detailed plan of the areas to be occupied and should include buffer areas between the

aquaculture site and the high value adjoining areas. It should also specify rehabilitation measures for unoccupied areas to enhance the natural values. This investigation area adjoins the Avalon aquaculture zone recommended in the Interim Report (1998).



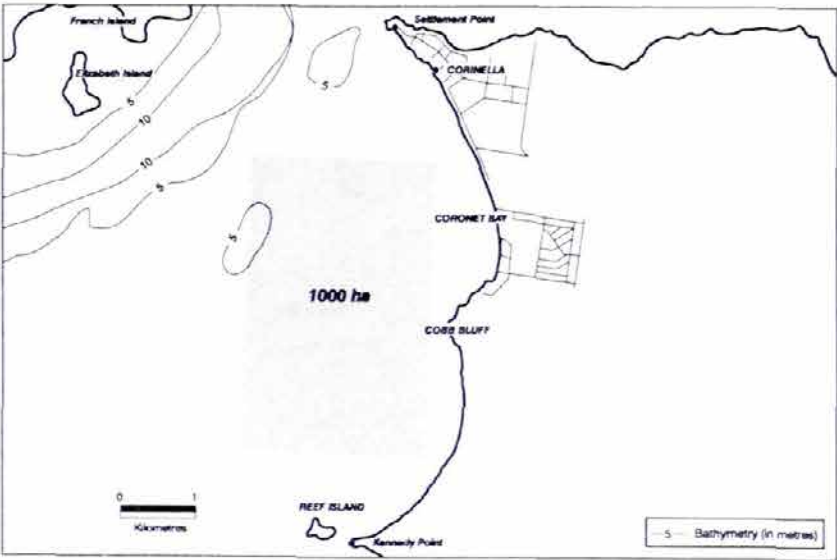
F3 Kirk Point – Werribee River Investigation Area

The 5 800 ha area is characterised by shallow water and is influenced by outflows from the Melbourne Water Western Treatment Plant at Werribee. As a result these waters are nutrient rich and are likely to be highly productive. Suitable species groups for this area are seaweeds and shellfish. Products such as mulches and soil tonics for the horticultural market and agar for bacteriological plates could be produced from farmed seaweed. An aquaculture industry in this area would have the potential to reduce nutrient input to Port Phillip Bay from the Treatment Plant.



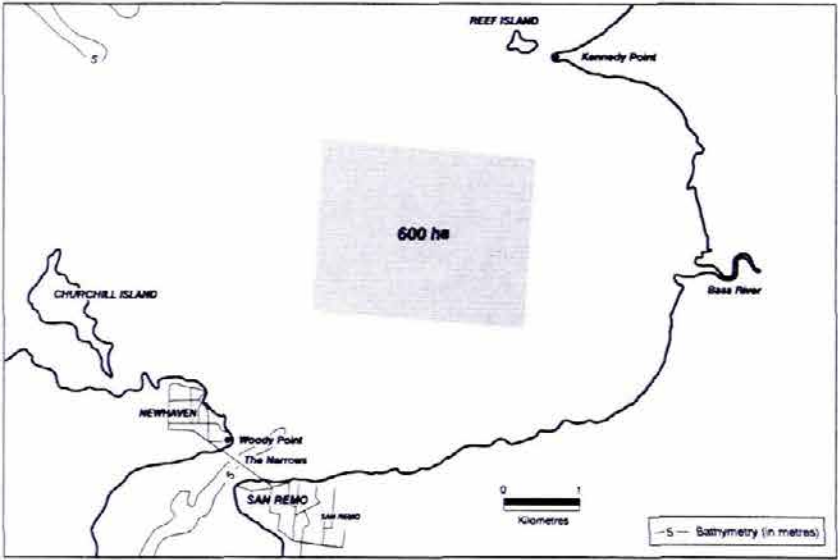
F4 Corinella Aquaculture Investigation Area

The whole of Western Port is designated as a Wetland of International Importance under the Ramsar Convention. Future designation of an aquaculture zone within this 1000 ha investigation area would be subject to a management plan for the area fully addressing protection of the Ramsar values. This area is suitable for shellfish. Recent information from Fisheries Victoria indicates that this area is important, and may well be critical, as a school shark nursery. The effects of aquaculture on juveniles and pregnant females are not known at this stage. This matter will be considered further, but the importance of this area for school shark may preclude some or all of the area from aquaculture use.



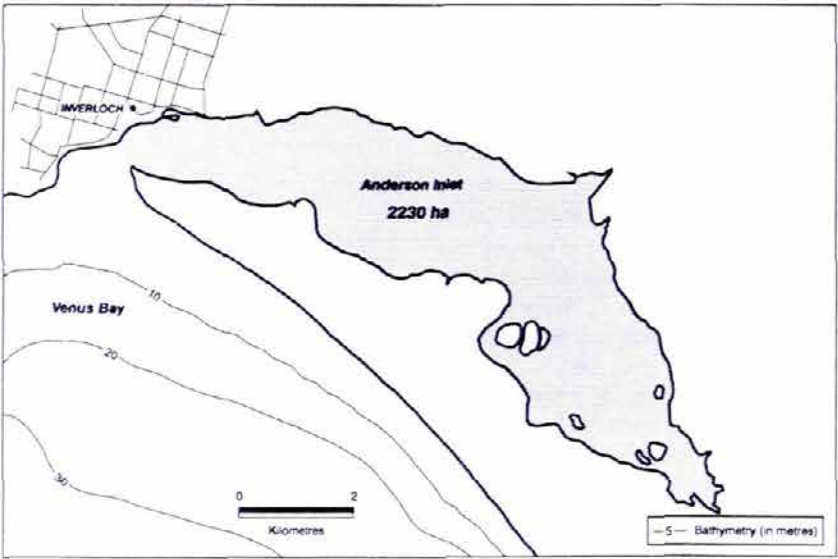
F5 Bass River Aquaculture Investigation Area

The whole of Western Port is designated as a Wetland of International Importance under the Ramsar Convention. Future designation of an aquaculture zone within this 600 ha investigation area would be subject to a management plan for the area fully addressing protection of the Ramsar values. This area off the Bass River mouth avoids dense seagrass beds. The area is suitable for shellfish.



F6 Anderson Inlet Aquaculture Investigation Area

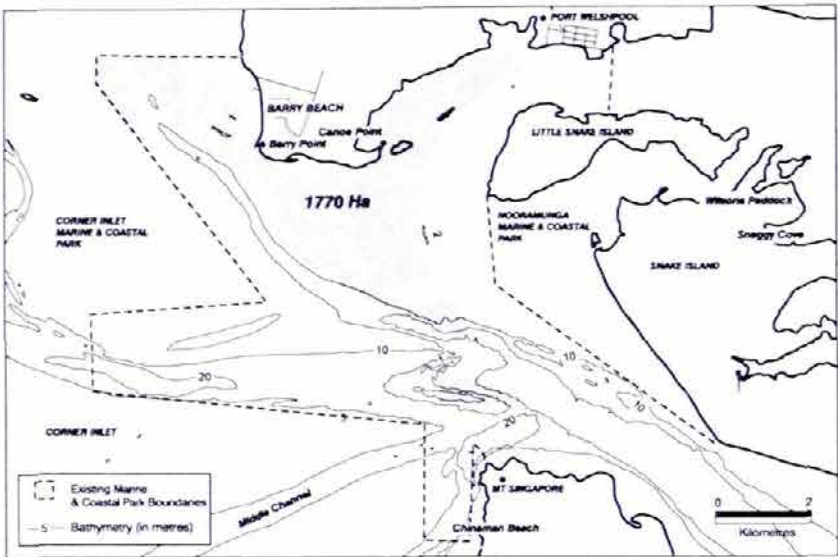
Anderson Inlet (2230 ha) is an important area for waterbirds having internationally significant populations of four species. The inlet also supports a higher proportion of juvenile waders than most Victorian inlets. Future designation of an aquaculture zone within this investigation area would be subject to a management plan for the area fully addressing maintenance of environmental values, especially in relation to waterbirds. This area is suitable for shellfish.



F7 Corner Inlet Aquaculture Investigation Area

The whole of the Corner Inlet and Nooramunga area is designated as a Wetland of International Importance under the Ramsar Convention. Important roosting sites for wading birds are located within this 1770 ha investigation area, especially south of Barry's Beach at Barry Point east to Canoe Point. Future designation of an aquaculture zone within this investigation area would be subject to a management plan for the area fully addressing protection of these sites. A study of the area commissioned by Fisheries Victoria⁴⁷ indicated that the area had potential for production of shellfish, sea urchins and finfish.

No aquaculture areas (or zones) have been recommended within the Corner Inlet and Nooramunga Marine and Coastal Parks. The recommended investigation area is



outside the marine parks, but may be used to establish the viability of aquaculture in the general area. If the viability of aquaculture is demonstrated in the investigation area then, following preparation of a draft management plan, the Government could consider areas

within the Parks as aquaculture zones. Preparation of the management plan should include public consultation, and an analysis of the costs and benefits and also the scale of the proposal.



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 - Kinhill Pty Ltd, *Socio-economic Impacts of Future Management Options for Scalefish in Victoria's Bays and Inlets*
 - Marine and Freshwater Resources Institute, *Influence of Environmental and Habitat Features on Scalefish Catches from Victorian Bays and Inlets*
 - Read Sturgess and Associates, *Impacts on Fish Markets of Varied Scalefish Catches*
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Appendix 1

List of Organisations/Committees Consulted During the Process

Abalone Fishermens Co-operative (Mallacoota)	Corinella Boating and Angling Club
Abalone Sub-committee of FCMC	Corner Inlet Professional Fishermen
Angair Inc.	Department of Infrastructure
Anglers Association, Victorian Branch	Department of Natural Resources and Environment (various divisions - listed separately)
Aquaculture Branch (NRE)	Department of Premier and Cabinet
Aquaculture Sub-committee of FCMC	Dive Industry Victoria Association Inc
Australian Anglers Association	Dolphin Research Institute
Australian Marine Conservation Society	Dolphin Research Program
Australian Sea Urchin Pty Ltd	Duck Dive Scuba
Australian Underwater Federation (Victorian Division)	Earthcare
Barwon Coast Committee of Management	East Gippsland Estuarine Fishermens Association
Bass Coast Shire Council	East Gippsland Fisheries
Bays and Inlets Sub-committee of FCMC	East Gippsland Shire Council
Bayside City Council	Eastern Zone Rock Lobster Association
Bayside Council's Association	Eco/Sound Fish Industries and Aquaculture
Beaumaris Conservation Society	Environment Protection Authority
BHP	Environment Victoria
Black Rock and Sandringham Conservation Association	Fishcare
Borough of Queenscliff Environment Committee	Fisheries Co-Management Council (plus various sub-committees – listed separately)
Bridgewater Bay Coast Action Group	Frankston Beach Association
Cape Conran Caravan Park	Friends of Bunurong
Cardinia Shire Council	Friends of Seaford Foreshore
Central Coastal Board	Friends of the Bluff
Cheetham Aquaculture	Friends of Walkerville
Childers Cove Progress and Tourist Association	Geelong and District Angling Club
City of Greater Geelong	Geelong Angling Club
Coast Action/Coastcare Central South West	Geelong Environment Council
Coast Action/Coastcare NRE Geelong	Geelong Field Naturalists Club
Colac and Otway Shire Council	Geelong Gun and Rod Association Inc
Conservation Sub-committee of FCMC	Geelong Otway Tourism
Corangamite Shire Council	



Gippsland Aquaculture Industry Network	North Foreshore Preservation Society
Gippsland Coastal Board	Ocean Rescue 2000 Community Network
Glenelg Shire Council	Orbost Chamber of Commerce and Industry
Golden Beach and Paradise Beach Ratepayers Association	Parks Victoria
Gunditjmara Aboriginal Co-operative	Parks, Flora and Fauna Division (NRE)
Inverloch Residents and Ratepayers Association	Phillip Island Conservation Society
Kananook Creek Association	Phillip Island Hooded Plover Society
Kilcunda Abalone Farm	Polperro Dolphin Swims
Koroit and District Angling Club	Port Campbell Boat Charter
Lake Tyers Coast Action Inc	Port Campbell Environment Group
Lakes Entrance Dive Shop	Port Campbell Professional Fisherman's Association
Lakes Entrance Fishermen's Co-operative Society	Port Fairy Professional Fisherman's Association
Mallacoota and District Angling Clubs	Port Franklin Fishermen's Association
Mallacoota Community Association	Port Phillip and Westernport Bay Professional Fishermen's Association
Mallacoota Inlet Business and Tourism Association	Port Phillip Conservation Council
Mallacoota Surf Riders Inc	Portland Field Naturalists Club
Marine and Freshwater Resources Institute (NRE)	Portland Professional Fishermen's Association
Marine Discovery Centre	Queenscliff Community Association
Marine Education Society	Queenscliff Professional Fishers
Marine Science and Ecology Group	Recreational Marine Sub-committee of FCMC
Marine Stewardship Council	Rhyll Phillip Island Angling Club
Marlo Caravan Park and Motel	Rhyll Progress Association
Marlo Hotel and Country Retreat	Rock Lobster Fishers, Portland
Melbourne Water	Rosebud Central Traders
Minerals and Petroleum Victoria (NRE)	Rosebud Foreshore Committee
Minerva Gas Development Consultative Committee	San Remo Fishermen's Co-operative
Mordialloc Beaumaris Conservation League	San Remo Professional Fishermen
Mornington Peninsula Environment Group	Sandringham Conservation Society
Mornington Peninsula Heritage Community	Scuba Divers Federation
Mornington Peninsula Shire Council	Seafood Industry Victoria (SIV)
Moyne Shire Council	Seaford Foreshore Committee
Museum of Victoria	Shire of Wellington
Mussel Growers Association	Snowy River Country Business Tourism Association
Nepean Ratepayers Association	South Gippsland Angling Clubs Association
Newhaven Coast Action	South Gippsland Conservation Society
Newhaven Yacht Squadron	South Gippsland Shire Council
Nobbies Action Group	Southern Hunter Fisheries
	South-West Environment Action Group



Sou-west Seafoods	Victorian National Parks Association
State Boating Council	VRFish
Surf Coast Shire Council	Walkerville Ratepayers Association
Surfers Appreciating Natural Environment (SANE)	Warrnambool City Council
Surfriders Foundation	Warrnambool Field Naturalists Club
Swan Bay Environment Association	Warrnambool Professional Fisherman's Association
Tooradin District Angling Club	Wathaurong Aboriginal Co-operative Ltd
Torquay Angling Club	Wellington Shire Council
Torquay Coast Action Group	Welshpool and District Consultative Committee
Tourism Victoria	Western Abalone Divers Association
Underwater Victoria	Western Coastal Board
Victorian Abalone Divers Association	Western District Association of Angling Clubs
Victorian Abalone Processors Association	Western Port Angling Club
Victorian Aquaculture Council	Western Port Catchment Action Committee
Victorian Channels Authority	Western Port Protection Council
Victorian Coastal Council	Western Zone Wrasse Fishermen's Association
Victorian Fishing Charter Association	Westernport Bird Observers Club
Victorian Fishing Industry Federation (now SIV)	Wetlands International
Victorian Marine and Coastal Community Network	Wyndham City Council
Victorian Mussel Growers Association	



Appendix 2

Marine, Coastal and Estuarine Investigation Advisory Group Members

NAME	EXPERTISE
Ms Kate Brent	Marine conservation
Mr Lawrance Ferns	Marine management (NRE)
Mr Tony Landy	Community (Coastal management)
Mr Andrew Levings	Commercial fishing and research
Dr Garth Newman	Marine fisheries research
Mr Tim O'Hara	Marine biology
Ms Bernadette O'Neil	Marine protected areas (Federal Govt)
Mr Peter Rankin	Aquaculture industry
Mr Ross Winstanley	Recreational fisheries (NRE)



Appendix 3

Victorian Coastal Strategy

Background

The Victorian Coastal Council was appointed under the *Coastal Management Act* 1995 as the peak body for the strategic planning and management of the Victorian coast, and to provide advice on coastal issues to the Minister for Conservation and Land Management.

The *Coastal Management Act* 1995 defines objectives for coastal management and the functions of the Council. The Council has eleven members and is supported by three Regional Coastal Boards – Western, Central and Gippsland.

One of the Council's major statutory tasks was to prepare a Strategy for the whole of the Victorian coast. This Strategy was developed in consultation with the Victorian community and major stakeholders.

The Strategy, published in 1997, clearly defines what needs to be done now to achieve long-term objectives. Under the Coastal Management Act land managers must take all reasonable steps to give effect to the Strategy. The Act also requires that the Strategy is reviewed every five years to ensure it remains relevant and effective.

Strategy - Vision Statement

The Victorian Coastal Strategy provides the framework to realise the vision for the coast. With community support and involvement, the Strategy will ensure that in the long-term, the outcomes for Victoria's coast will:

Ensure the sustainable use of natural resources, so that the coastal and marine environment will be in better health in 20, 50 and 100 years time, and

- is managed to preserve a diversity of marine and land-based ecosystems so that natural systems and species can flourish and maintain productivity in the wild,
- has improved standards of marine and estuarine water quality,
- is managed for the long term with care, efficiency and skill,
- is internationally recognised as one of the best coastlines in the world.

Ensure the protection of significant environmental features of the coast through establishing:

- a comprehensive system of well managed national, marine and coastal parks and reserves which ensure long term conservation and public benefit,
- other forms of open space which provide for the conservation and protection of significant natural areas,
- effective mechanisms and actions to ensure the conservation and management of indigenous coastal and marine flora and fauna on public and private land.



Provide clear direction for the future use of the coast including the marine environment, and which

- integrates the planning and management of coastal land and sea,
- provides a diversity of experiences for Victorians and visitors,
- effectively and clearly defines areas for the location of appropriate activities,
- is characterised by world class quality of design, construction and maintenance.

Identify suitable development and development opportunities on the coast, and which

- are recognised for the significant role they play in contributing to the economic prosperity of Victoria,
- continue to contribute to the health and well being of the millions of people who visit and use the coast,
- support an ecologically sustainable range of new and improved commercial, recreational and tourism activities of world class standard,
- has developments which are of a scale and character sympathetic to the surrounding coastal landscape or built environment.

Scope of the strategy

Under the *Coastal Management Act* 1995, the Victorian coast includes:

- land and waters on the seaward side of coastal watersheds,
- the sea and seabed to the State limit – three nautical miles (or approx, 5.5 km).

This provides scope for the Strategy to address any activity or process which may have an impact on the coastal and marine environment, both now and in the future, including:

- **catchment impacts** – catchment management practices, both urban and rural, can affect the quality of water entering the coastal and marine environment and may create sedimentation of estuaries and bays and littering of beaches,
- **nearshore and offshore impacts** – litter, oil and waste from shipping and boating can cause pollution of the marine and coastal environment.

While taking the broad view of the coastal and marine environment, the Strategy clearly recognises that there are many agencies with

statutory responsibility along the Victorian coast with programs in place to improve coastal and marine management.

The Strategy provides coordination for these agencies' activities, ensures there is minimal duplication and addresses the strategic gaps in coastal and marine management.

There are many actions in the Strategy which relate to use and development of specific sites in coastal and marine areas. These actions require a more specific view of the coastal and marine environment. It is not intended that the Strategy comment on issues which are unrelated or remote from the coastal or marine environment, or activities which do not have an impact on it.

Much of the Strategy, therefore, relates to:

- the foreshore or the coastal Crown land strip,
- coastal land managed under the *National Parks Act* 1975,
- private land adjacent to and within the critical viewshed of the foreshore,
- the seabed and water immediately offshore.



Appendix 4

Interim Marine and Coastal Regionalisation for Australia

The Interim Marine and Coastal Regionalisation for Australia (IMCRA) has been developed as a regional framework for planning resource development and biodiversity conservation. The IMCRA was developed through the collaborative efforts of State, Northern Territory and Commonwealth marine conservation and research agencies. It was endorsed by the Australian and New Zealand Environment and Conservation Council in June 1998 as a key element of the Strategic Plan for the Establishment of a National Representative System of Marine Protected Areas.

In simple terms, the IMCRA is a series of maps and descriptions of Australia's marine waters that identifies regions with biological and physical characteristics distinct from those elsewhere in Australia. The IMCRA classification was developed using both a qualitative expert approach and quantitative analytical methods, reflecting the range of available methodologies and the highly variable quality and quantity of data available.

The development of these regionalisations should be regarded as an evolving process. As new information becomes available, it will be necessary to review and enhance the regionalisations to take account of improved data and information.

Five regions for Victoria were incorporated into the IMCRA:

Flinders

Central Victoria

Otway

Twofold Shelf

Victorian Embayments.

With the exception of the Victorian Embayments region, all regions also include waters in other States or Commonwealth waters.

The following are descriptions of the five (Victorian) IMCRA meso-scale regions:

Flinders

Location – Eastern entrance to Bass Strait and including Wilsons Promontory, Flinders Island and other islands (but not the Kent Group).

Climate – Cool temperate, meso thermal climate with cool wet winters and warm summers.

Oceanography – Mean sea-surface temperature varies from 20°C in summer to 13°C in winter. Submaximal wave exposure which is highly variable especially on Wilsons Promontory with wave energy of 18 kW/m on the western side to 4 kW/m on the eastern side where it is protected from the dominant south-west swell direction. Tidal characteristics (velocities and amplitudes) vary markedly across the region as determined by the geometry of the eastern entrance to Bass Strait. Tidal range varies from 2–3 m with the greatest range occurring between the islands in the southern part of the region.

Geology and geomorphology – Predominantly granite (Wilsons Promontory, Flinders and other islands) and unconsolidated clastic sediments. Rocky headlands and promontories are prevalent with long sandy beaches between. Located on the continental shelf on the eastern entrance to Bass Strait. Low offshore slopes and extensive offshore reef systems often present in the south but shores plunge steeply onto sandy sea floor to the north around Wilsons Promontory.



Biota – Fish and plant species-richness both high, when compared with Tasmanian regions. The biota is typical of the Bassian Province, with warm-temperate species commonly found in NSW also present in low numbers.

Estuaries – Most estuaries are in the Furneaux Group, which has nine moderate-size estuaries and numerous coastal lagoons. Shallow Inlet, the only major lagoon west of Wilsons Promontory, lies at the northern end of the region. See also Victorian Embayments.

Central Victoria

Location – Cape Otway to west of Wilsons Promontory

Climate – Moist temperate with warm summers.

Oceanography – Amplitudes and phases of tides increase eastwards. Mean annual sea-surface temperature is approximately 15.5°C. Moderate wave energy (9–18 kW/m) can be divided into Cape Otway to Point Lonsdale (9 kW/m) which faces south-east and is protected from the dominant swell direction; and Point Lonsdale to Wilsons Promontory (18 kW/m), which faces south-west and receives the south-westerly swell.

Geology and geomorphology – Dominated by cliffed shorelines in Quaternary, Tertiary and Mesozoic sediments. Contains the western-most occurrence of granites and granodiorites. Orientation changes from facing south-west (Cape Otway to Point Lonsdale) to generally south-west facing (Point Lonsdale to Wilsons Promontory). Very steep offshore gradients to the 20 m contour (1:50) and steep to the 50 m contour (1:100). Minor flattening out between the 20 and 50 contours in the region offshore from approximately Port Phillip Heads to Cape Patterson.

Biota – Marine and fauna and flora are typically cool temperate. Sheltered rock platforms are covered in a mixed algal assemblage including various green (eg. *Codium*, *Caulerpa*), brown (eg. *Cystophora*, *Sargassum*) and red algae. This assemblage continues into the shallow subtidal (5–20 m) on south-east facing coasts such as off

Point Lonsdale and Bunurong. The more exposed coasts are fringed with *Durvillaea* with mixed *Phyllospora* and *Ecklonia* stands occurring on subtidal reefs. Small beds of *Amphibolis antarctica* seagrass occur on sand in sheltered locations. Many western species have their eastern distribution limit within central Victoria particularly between Bunurong and Wilsons Promontory.

Estuaries – See Victorian Embayments (see page 134).

Otway

Location – Cape Jaffa to slightly north of Apollo Bay and including King Island environs. (Narrow band across the western entrance of Bass Strait.)

Climate – Cool temperate meso-thermal climate with cool, wet winters and warm, dry summers.

Oceanography – Coastline typically high energy, with wave energy dependent on the orientation to prevailing swell direction and cross shelf width. The western region is typified by a high deepwater wave energy, attenuated by a steep offshore-nearshore gradient and offshore reefs, which provide for moderate to low energy conditions. Waters are cold temperate and typified by localised, regular, seasonal, cold, nutrient-rich coastal upwellings in the west of the region. Mean sea surface temperatures vary from 14°C in winter to 18°C in summer (decreasing to 11–12°C under the influence of the upwellings.) The far eastern region (ie. King Island area) is influenced during winter months by warm waters, making this region warmer than other Tasmanian waters at that time. Here also, summer water temperatures are cooler than elsewhere in the Bassian Province.

Tidal range is small (ie. ~ 0.8 to 1.2 m range), through much of the area, however tidal ranges and velocities vary rapidly in that part of the region forming the western entrance to Bass Strait.

In the western region, two large unconfined aquifers (in the Gambier Limestone and Dilwyn



Formation) discharge freshwater at the coast via beach springs and spring lakes.

Geology and geomorphology – Narrow, dominantly south-west facing, continental shelf, including the western entrance to Bass Strait. Small barrier coast dominated by a steeply sloping offshore gradient, dominated by bioclastic carbonate sediments, and few coastal embayments. Coastal geology comprises headlands of Pliocene-Pleistocene volcanic outcrops, and also Pleistocene dune rock cliffs, shore platforms and offshore reefs (which provide coastal protection), Tertiary sediments and, around King Island, Palaeozoic granite and associated sediments. Sandy beaches common in the western region (and around King Island), and also, within coastal embayments (ie. Rivoli Bay, Guichen Bay) which are characterised by Holocene beach ridge plains, beaches and dunes. Cluffed shorelines common elsewhere.

Biota – Marine flora and fauna typically cold temperate (ie. Maugean element of the Flindersian Province). Intertidal and sublittoral fringe on wave-exposed coasts dominated by the bull kelp, *Durvillea potatorum*. Rocky subtidal macro-algal communities are dominated by *Macrocystus angustifolia*, *Phyllospora comosa* and other large brown fucoid algae. For many macro-algal communities, this region forms the westward limit of a number of key species. Extensive areas of seagrass occur in the limited sheltered embayments, with smaller areas in the lee of reefs. Subtidal seagrass meadows dominated by *Posidonia australis* in shallow areas, *P. sinuosa*, *P. angustifolia* and *Amphibolus antarctica* in deeper waters. Rivoli Bay is the easterly limit of *P. coriacea* and *P. denhartogii*. Port MacDonnell is the easterly of *P. angustifolia*. Plant species diversity is very high, particularly among the red algae.

Fish and plant species-richness are both high compared to other South Australian, Victorian and Tasmanian regions. This is the only recorded area within Tasmanian waters where several species more typically associated with South Australia occur (eg. the queen morwong *Nemadactylus valenciennesi*). Coastal wetlands of national importance in the region include

Butchers and Salt Lakes, Ewens Ponds, Piccaninnie Ponds and the coastal lakes of Lake Robe, Eliza, George, and St Clair.

Estuaries – No true rivers in the western region, but a few groundwater-fed creeks (eg. Eight Mile Creek, Ellards Creek), and coastal salt lakes intermittently connected to the sea (eg. Lake George). Six moderate-sized barrier estuaries on King Island and numerous coastal lagoons. See also Victorian Embayments.

Twofold Shelf

Location – East of Wilsons Promontory and north to Tathra (36° 48'S), including the Kent Group of islands (around 39° 25'S).

Climate – Moist cool temperate with warm summers and a tendency towards winter-spring rainfall.

Oceanography – Water temperatures reflect the influence of warmer waters brought into Bass Strait by the East Australian Current, with the southern section of the Twofold Shelf being considerably warmer in summer than other more southerly Tasmanian regions. Along the NSW section coastal oceanographic circulation is influenced mainly by northwards setting coastally trapped waves generated in Tasman Sea waters, although inshore a northerly flowing tongue of Bass Strait water is generally present. Intermittent upwellings occur along parts of the east Gippsland coast. Wave energy is relatively low, particularly in the broader shelf area in the Gippsland Basin. Stalled low pressure systems in the Tasman Sea during summer generate higher wave energy at this time. The wave climate in the NSW section is characterised by a range of typical breaker heights between 1.0 and 2.0 m, and low relative frequency of peak wave energy fluctuations, with a peak of wave energy occurring in February.

Geology and geomorphology – The NSW and northern Victorian sections are bordered by the Lachlan Fold Belt and the Victorian coastline is dominated by Quarternary dunes and dune



sediments and associated sandy shorelines (mainly Ninety Mile Beach). It also contains numerous occurrences of Palaeozoic sediments and granites. The continental shelf is relatively narrow in the northern section, becoming much broader (and shallower) in the southern area of the Gippsland Basin. Changes in shelf width are associated with marked changes in coastline orientation, from east facing in the north to south-south-east facing in the south. Orientation in the Victorian section varies from south-east to Lakes Entrance, south to Rame Head then south-east to the NSW border. North of this, the coastline faces generally east-south-east. The continental shelf shows a very steep inshore profile (0–20 m), with a less steep inner (20–60 m) to mid (60–120 m) shelf profile, and a generally flatter outer shelf plain (120–160 m) south-west of Cape Howe. Seaward the sediments are poorly sorted, with a median of 92% sand and 8% gravel; they are composed of organic material, with a median of 64.5% calcium carbonate.

Biota – The fauna is characterised distinctive species assemblages of reef fish, echinoderms, gastropods and bivalves. Reefs are generally dominated by warm temperate species that occur commonly in southern NSW, particularly the large sea urchin *Centrostephanus rodgersii* which removes macroalgae from shallow reefs, creating a coralline algal encrusted habitat.

Estuaries – The larger estuaries in this region occur in the south, including the Gippsland Lakes, Sydenham Inlet and Mallacoota Inlet. (See also Victorian Embayments.)

Victorian Embayments

Location – Victorian bays, inlets and estuaries.

Climate – Moist temperate with warm summers, pronounced west to east variation in catchment run off and seasonality.

Oceanography – Because of their small size fetch is limited with the greatest being 60 km in Port Phillip Bay. There are large changes in tidal phase and amplitude within them compared with the open coast, with a maximum amplitude of 3.1 m recorded in Westernport. Large and rapid changes in tidally induced velocities also occur.

Geology and geomorphology – A variety of forms are evident from drowned river valleys to impounded drainage as a result of the development of dune barrier systems. Depositional substrates dominate, with rock outcrops limited mainly to the margins. Tend to be basin shaped, the maximum depth is variable but is generally less than 20 m.

Biota – Victorian bays and estuaries contain a diverse range of biotic assemblages depending on their morphological and hydrological characteristics. Port Phillip Bay is a marine embayment fringed by seagrass beds, rocky reefs and sandy beaches. The benthic assemblages in the muddy central region are distinct from those in the sand to the west and east. Western Port Bay and Corner Inlet are large muddy estuaries with extensive mudflats and seagrass beds. The turbid water in Western Port allows many subtidal animals to occur in relatively shallow water. The small narrow estuaries in western Victoria have an impoverished benthic fauna compared to those in the east which tend to be larger and better wind-mixed. The dominant seagrass species are *Zostera muelleri* and *Heterozostera tasmanica*, with large areas of *Posidonia australis* occurring in Corner Inlet/Nooramunga, and the east coast species *Zostera capricorni* reaching its southern limit in Mallacoota Inlet. The estuaries of eastern Victoria are distinguished from those in the centre and west by the presence of penaeid prawns.

Estuaries – Various.



Appendix 5

Criteria for Marine Aquaculture Sites

Marine-based sites

	Shellfish	Finfish
Water depth	For subtidal species minimum depth of 10 m with more than 12 m generally preferred.	Minimum depth of 12 m with more than 20 m preferred.
Waves	Generally maximum wave heights less than 2 m. Wave period (which defines wave steepness) should be more than 5 seconds.	Generally maximum wave height of 2–3 m. Costs increase significantly with waves greater than 3 m.
Salinity	Salinity levels need to be considered for individual species.	
Water temperatures	Of less significance than for finfish, however, increased growth rates may be achieved where temperatures are at the higher end of the natural range for the species.	Water temperatures directly influence physiological processes including growth. Higher end of natural temperature range is advantageous for growth, dependent on the species. Cold water species (e.g. Atlantic Salmon) will require production strategies that minimise the impact of high summer water temperatures in Victoria.
Contamination	Sites should not be in downstream proximity to effluent outfalls and heavy metal contamination and faecal coliform counts should be within set limits.	
Nutrient status of water	Prefer higher level algal biomass, often indicated by the presence of chlorophyll A. This generally occurs where catchment runoff has enriched the water or where upwelling of ocean water has carried nutrients from bottom sediments.	Not directly significant, however, nutrients may influence the extent of marine biofouling on sea pen nets.
Algal blooms	Areas with no known history of algal blooms preferred. Known algal bloom areas may be acceptable where there are other benefits (e.g. high nutrient water) and where blooms are either rare or predictable so that stock can be moved. In the latter case alternative sites would also be required.	
Currents and flushing	Within range of 5–50 cm per second av. current. Greater current speeds will require additional mooring design consideration.	Within range of 5–50 cm per second av. current. Problems in managing equipment at speeds greater than 50 cm per second.
	Flushing (or water exchange) may be less significant for shellfish compared with intensive finfish farming. Well flushed sites enable adequate oxygen exchange, dispersal of organic sediment outputs and reduce competition for nutrients (e.g. filter-feeding shellfish). Shellfish are liable to remove nutrients from the water while finfish are liable to add matter to the water over a localised area. For these reasons aquaculture sites should operate well within defined boundaries with adequate separation from high conservation value sites, e.g. marine protected areas.	
Wind	Areas with some protection from prevailing winds are preferred. Boat access and serviceability is limited where winds (greater than 20–30 knots) over an extended fetch generate unsuitable wave climate.	
Sea floor	Generally prefer sandy sea floors while avoiding areas such as reefs and seagrass beds with high environmental and other values. Areas where benthos recovery time from any effects are likely to be slow should also be avoided.	
Area available	Designated areas should be large enough to meet the following criteria: of sufficient size for a viable industry with reasonable economies of scale; room for a number of separate licence areas; sufficient space between sites to reduce the risk of spread of disease and to enable general access between farmed areas; the total area needs to be of sufficient size to allow regular fallowing of actually utilised sites. The figures below are indicative of intensity of use within lease areas.	
	At any one time ~33% of lease area in actual use. Within this area intensity of use would be low with normally 10–20 m between surface long lines.	At any one time around 5% of actual lease area would be in use to allow for rotation of pens. Pens are usually about 25 m in diameter.
Access	Areas should be in reasonable proximity to land-based infrastructure. Access is more important for finfish where generally daily access will be required. Remote stations on aquaculture sites (houseboats etc.) have been established overseas, however this will increase production costs.	
Land-based infrastructure	For some species (e.g. mussels) grading and cleaning generally done at sea. Require port or jetty with loading and unloading facilities, vehicle access and vessel mooring.	Generally more land-based infrastructure required than for shellfish. Harvest, grading and processing facilities generally required close to port with cool store and feed storage.
Visual impact	Areas should preferably be where visual impact will be minimised.	



Land-based sites

Salinity of water source	Salinity levels need to be considered for individual species.
Water temperature	This will often be controlled on site.
Contamination	Water intake site should not be in a downstream proximity to effluent outfalls and heavy metal contamination and faecal coliform counts should be within set limits.
Nutrient status of water	For shellfish a higher level of algal biomass is preferred. Not a significant factor for finfish.
Turbidity	Low turbidity water is preferred.
Algal blooms	Areas with no (or very low) history of algal blooms are preferred.
Water intake site	Site should be where environmental effects of the intake and pipeline are acceptable and where pumping requirements are minimised.
Waste discharge	Ideally land-based aquaculture should aim for zero discharge, but this will not always be practicable. Any discharge should be subject to EPA works approval and should be adequately separated from high conservation value sites (eg. marine protected areas) and possibly high recreation use areas.
Area available	Visible impact should be able to be minimised. Where private land is utilised, the proposal will need to meet the required planning provisions. Where public land is utilised, it must be demonstrated that the proposal is the most appropriate use for the land from a whole-of-community perspective.



Appendix 6

Estimates of Commercial Fisheries Values in Recommended Marine National Parks

Note: In the tables below, the letters (W), (C) or (E) denote the western, central or eastern fishery zone respectively (where applicable).

Discovery Bay Marine National Park

Fishery	Weight kg	Value \$	% of zone	% of State total
Abalone (W)	14 171	433 334	5.1	1.0
Rock Lobster (W)	14 453	382 153	3.4	2.9
Other		9 946	na	na

Twelve Apostles Marine National Park

Fishery	Weight kg	Value \$	% of zone	% of State total
Abalone (C)	22 794	683 923	3.3	1.6
Rock Lobster (W)	12 853	360 965	3.0	2.6
Other		39 279	na	na

Note: All figures are for an area approximately 15% larger than the recommended park.

Point Addis Marine National Park

Fishery	Weight kg	Value \$	% of zone	% of State total
Abalone (C)	1 638	49 143	0.2	0.1
Rock Lobster (E)	1 750	51 618	2.6	0.4
Other		51 888	na	na

Point Cook Marine National Park

Fishery	Weight kg	Value \$	% of zone	% of State total
Abalone (C)	27 092	774 772	3.9	1.9
Rock Lobster (E)	0	0	0	0
Other		13 944	na	na



Yaringa Marine National Park

Fishery	Weight kg	Value \$	% of Western Port
Other		no estimate*	no estimate

* The ECC is aware of some fishing activities that occur in this area, especially mesh netting for mullet, but has not yet obtained any quantitative estimates for their value and extent. The amount is expected to be relatively low.

North Western Port Marine National Park

Fishery	Weight kg	Value \$	% of Western Port
Other		40 000	19

Rhyll Inlet Marine National Park

Fishery	Weight kg	Value \$	% of Western Port
Other		11 289	2.6

Bunurong Marine National Park

Fishery	Weight kg	Value \$	% of zone	% of State total
Abalone (C)	0	0	0	0
Rock Lobster (E)	896	25 931	1.31	0.18
Other		5 957	na	na

Wilsons Promontory Marine National Park

Fishery	Weight kg	Value \$	% of zone	% of State total
Abalone (C)	31 712	943 740	4.5	2.2
Rock Lobster (E)	1 282	28 256	1.6	0.2
Other		167 444	na	na

Ninety Mile Beach Marine National Park

Fishery	Weight kg	Value \$	% of zone	% of State total
Abalone (C)	0	0	0	0
Rock Lobster (E)	0	0	0	0
Other*		no estimate	no estimate	no estimate

* The ECC is aware of commercial fishing activities such as some inshore trawling for Australian Salmon and hooking for snapper further offshore. It has not yet obtained any quantitative estimates for their value and extent. Value of all fisheries is likely to be low.



Point Hicks Marine National Park

Fishery	Weight kg	Value \$	% of zone	% of State total
Abalone (E)	16 716*	484 000*	3.6*	1.2
Rock Lobster (E)	890	22 562	1.3	0.2
Other		41 791	na	na

*These estimates are based on the assumption that only half of the reef at Point Hicks is within the proposed park.

Cape Howe Marine National Park

Fishery	Weight kg	Value \$	% of zone	% of State total
Abalone E	19 668	590 040	4.3	1.4
Rock Lobster E	61	2 019	neg	neg
Other		98 598	na	na

Western Zone – abalone

The Western Zone for this fishery runs from the South Australian border to the mouth of the Hopkins River near Warrnambool. Discovery Bay Marine National Park is the only recommended park within the Western Zone of the abalone fishery. The impact on the Western Zone abalone fishery is the loss of grounds that have historically yielded approximately 14 tonnes or 5.1% of the Western Zone catch.*

Western Zone – rock lobster

The Western Zone for this fishery runs from the South Australian border to just east of Cape Otway. The recommended Discovery Bay Marine National Park and the Twelve Apostles Marine National Park represent the only two recommended parks within the Western Zone of the rock lobster fishery. In combination they represent a loss of grounds that have historically yielded approximately 6.4% of the Western Zone rock lobster catch.

Central Zone – abalone

The Central Zone for this fishery runs from the mouth of the Hopkins River at Warrnambool to Lakes Entrance. The combined effect of the recommended Twelve Apostles, Point Addis, Point Cook and Wilsons Promontory Marine National Parks is the loss of ground that has historically yielded approximately 11.9 % of the Central Zone abalone catch.

Western Port

In Western Port, the recommended Yaringa, North Western Port and Rhyll Marine National Parks do not have reefs that are normally accessed by commercial rock lobster and abalone fishers. The areas proposed as Yaringa and Rhyll Marine National Park are known to have a limited amount of commercial fishing within their boundaries. The recommended North Western Port Marine National Park is popular amongst commercial fishers, the area surveyed by MAFRI is larger than the proposed park and includes the significant Post Office

* The phrase 'historically yielded' is used as this indicates that there may be other areas that can provide the tonnage of fish. The relevant stock assessment group (or equivalent) is best placed to assess the actual impact of creation of the recommended marine national parks on each fishery. Stock assessment groups are convened annually by MAFRI, and involve biologists, commercial fishers, managers and recreational fishers to assess the biological state of a fishery.



Channel. The area surveyed by MAFRI was reported as having average annual catches of approximately \$84 000 per annum, a high proportion of the Western Port catch. The exclusion of Post Office Channel is likely to reduce the impact of the park on commercial fishing activities to under \$40 000. The full effects of these proposals are unlikely to be made clear until the completion of the voluntary buy-back of commercial bays and inlets licences.

Eastern Zone – abalone

The Eastern Zone for this fishery runs from Lakes Entrance to the New South Wales border. The effect of the recommended Point Hicks and Cape Howe Marine National Parks on the eastern zone of the abalone fishery is the loss of grounds that have historically provided up to 7.9% of the Eastern Zone catch. The recommended Beware Reef Marine Sanctuary has historically yielded a relatively small but significant catch.

Eastern Zone – rock lobster

The Eastern Zone for this fishery runs from just east of Cape Otway to the New South Wales border. The effect of the seven recommended Marine National Parks within the eastern zone of the rock lobster fishery is the loss of fishing grounds that have historically yielded approximately 6.8% of the zone's catch.

Victorian commercial fisheries – Statewide summary

The effects of the recommended marine national parks across the whole Victorian abalone fishery is the loss of grounds that have historically yielded approximately 9.4% of the Victorian commercial abalone harvest. In the case of the Victorian rock lobster fishery, areas that have provided approximately 6.5% of the total catch of rock lobster will not be available for harvest. The effect of the proposed marine national parks on Victorian scalefish fisheries is the loss of access to grounds that have supplied an estimated \$500 000 of catch per annum. This will be increased by the effect of the recommended Corner Inlet Marine Sanctuary, which is estimated to have historically yielded approximately \$100 000 to commercial fishers. Generally, the effect on commercial fisheries of other marine sanctuaries is estimated to be minor.

