



MORNINGTON PENINSULA **AND** WESTERN PORT

BIOSPHERE
RESERVE

STAGE 1
NOMINATION
SUBMISSION TO UNESCO
PARIS ■ MAY 2002



Biosphere reserves are poised to take on a new role. Not only will they be a means for the people who live and work within and around them to attain a balanced relationship with the natural world; they will also contribute to the needs of society as a whole by showing a way to a more sustainable future. This is at the heart of our vision for Biosphere reserves in the 21st century.

— Seville Strategy 1995

Table of Contents

INTRODUCTION	7
OVERVIEW OF NOMINATION	8
PART I : SUMMARY	10
1. NAME OF THE BIOSPHERE RESERVE	10
2. COUNTRY	10
3. FULFILMENT OF THE THREE FUNCTIONS OF BIOSPHERE RESERVES	10
3.1 Conservation	10
3.2 Development	12
3.3 Logistic support	13
4. CRITERIA FOR DESIGNATION AS A BIOSPHERE RESERVE	15
4.1 "Encompass a mosaic of ecological systems representative of major biogeographic regions, including a gradation of human intervention"	15
4.2 "Be of significance for biological diversity conservation"	15
4.3 "Provide an opportunity to explore and demonstrate approaches to sustainable development on a regional scale"	16
4.4 "Have an appropriate size to serve the three functions of biosphere reserves"	18
4.5 Through appropriate zonation	18
4.6 "Organisational arrangements should be provided for the involvement and participation of a suitable range of inter alia public authorities, local communities and private interests in the design and the carrying out of the functions of a biosphere reserve."	22
4.7 Mechanisms for implementation	23
5. ENDORSEMENTS	25
5.1 Signed by the authority/authorities in charge of the management of the core area(s)	25
5.2 Signed by the authority/authorities in charge of the management of the buffer zone(s)	25
5.3 Signed as appropriate by the national (or state or provincial) administration responsible for the management of the core area(s) and the buffer zone	25
5.4 Signed by the authority/authorities, elected local government recognised authority or spokesperson representative of the communities located in the transition area.	26
5.5 Signed on behalf of the MAB National Committee or focal point	26
PART II : DESCRIPTION	27
6. LATITUDES AND LONGITUDES OF AREA	27
7. SIZE AND SPATIAL CONFIGURATION (see map 2 Stage 1)	27
7.1 Size of terrestrial core area(s)	27
7.2 Size of terrestrial buffer zone(s)	27
7.3 Approx. size of terrestrial transition area(s) (if applicable)	27
7.4 Brief rationale of this zonation (in terms of the various roles of biosphere reserves) as it appears on the zonation map	27
8. BIOGEOGRAPHICAL REGION	28
9. LAND USE HISTORY	29
10. HUMAN POPULATION OF PROPOSED BIOSPHERE RESERVE	31
10.1 Core area(s)	31
10.2 Buffer zone(s)	31
10.3 Transition area(s)	31
10.4 Brief description of local communities living within or near the proposed Biosphere reserve:	31
10.5 Name of nearest major town	32
10.6 Cultural significance	32
11. PHYSICAL CHARACTERISTICS (STAGE 1 & STAGE 2)	34
11.1 Site characteristics and topography of area	34
11.1.1 Highest elevation above sea level	34
11.1.2 Lowest elevation above sea level	34
11.1.3 For coastal/marine areas, maximum depth below mean sea level	34
11.2 Climate	35
11.2.1 Average temperature of the warmest month	35
11.2.2 Average temperature of the coldest month	35
11.2.3 Mean annual precipitation	35
11.2.4 If a meteorological station is in or near the proposed Biosphere reserve, indicate the year since when climatic data have been recorded	35
11.3 Geology, geomorphology, soils	35

12.	BIOLOGICAL CHARACTERISTICS	39
	12.1 First type of habitat/land cover	39
	12.1.1 Characteristic species	40
	12.1.2 Important natural processes	40
	12.1.3 Main human impacts	40
	12.1.4 Relevant management practices	40
	12.2 Second type of habitat/land cover	41
	12.2.1 Characteristic species	41
	12.2.2 Important natural processes	42
	12.2.3 Main human impacts	42
	12.2.4 Relevant management practices	42
	12.3 Third type of habitat/land cover	43
	12.3.1 Characteristic species	43
	12.3.2 Important natural processes	43
	12.3.3 Main human impacts	44
	12.3.4 Relevant management practices	44
	12.4 Fourth type of habitat/land cover	44
	12.4.1 Characteristic species	45
	12.4.2 Important natural processes	45
	12.4.3 Main human impacts	45
	12.4.4 Relevant management practices	45
	12.5 Fifth type of habitat/land cover	46
	12.5.1 Characteristic species	46
	12.5.2 Important natural processes	46
	12.5.3 Main human impacts	46
	12.5.4 Relevant management practices	47
	12.6 Sixth type of habitat/land cover	47
	12.6.1 Characteristic species	47
	12.6.2 Important natural processes	48
	12.6.3 Main human impacts (based on Gunthorpe and Hamer 1998)	48
	12.6.4 Relevant management practices	48
	12.7 Seventh type of habitat/land cover	48
	12.7.1 Characteristic species	48
	12.7.2 Important natural processes	48
	12.7.3 Main human impacts	48
	12.7.4 Relevant management practices	49
	12.8 Eighth type of habitat/land cover	49
	12.8.1 Characteristic species	49
	12.8.2 Important natural processes	49
	12.8.3 Main human impacts	49
	12.8.4 Relevant management practices	49
13.	CONSERVATION FUNCTION	50
	13.1 Contribution to the conservation of landscape and ecosystem biodiversity	50
	13.2 Conservation of species biodiversity	52
	13.3 Conservation of genetic biodiversity:	54
14.	DEVELOPMENT FUNCTION	55
	14.1 Potential for fostering economic economic and human development.	55
	14.2 If tourism is a major activity:	57
	14.2.1 Type(s) of tourism	57
	14.2.2 Tourist facilities and description of where these are located and in which zone of the proposed biosphere reserve	58
	14.2.3 Indicate positive and/or negative impacts of tourism at present or foreseen	58
	14.3 Benefits of economic activities to local people	58

15.	LOGISTIC SUPPORT FUNCTION	59
	15.1 Research and monitoring	59
	15.1.1 To what extent has the past and planned research and monitoring program been designed to address specific management questions in the potential biosphere reserve?	59
	15.1.2 Brief description of past research and/or monitoring activities	60
	15.1.3 Brief description of on-going research and/or monitoring activities	61
	15.1.4 Brief description of planned research and/or monitoring activities	62
	15.1.5 Estimated number of national scientists participating in research within the proposed Biosphere reserve	63
	15.1.6 Estimated number of foreign scientists participating in research within the proposed Biosphere reserve	63
	15.1.7 Estimated number of masters and/or doctoral theses carried out on the proposed Biosphere reserve each year	63
	15.1.8 Research station(s) within the proposed Biosphere reserve	63
	15.1.9 Permanent monitoring plots	64
	15.1.10 Research facilities of research station(s)	64
	15.1.12 Other facilities	64
	15.1.13 Does the proposed Biosphere reserve have an Internet connection?	64
	15.2 Environmental education and public awareness	65
	15.2.1 Describe environmental education and public awareness activities, indicating the target group(s)	65
	15.2.2 Indicate facilities for environmental education and public awareness activities [visitors' centre; interpretative programs for visitors and tourists; nature trails; ecomuseum demonstration projects on sustainable use of natural resources]	66
	15.3 Specialist training	67
	15.4 Potential to contribute to the World Network of Biosphere Reserves	67
	15.4.1 Collaboration with existing Biosphere reserves at the national level	68
	15.4.2 Collaboration with existing Biosphere reserves at the regional or subregional levels, including promoting transfrontier sites and twinning arrangements	68
	15.4.3 Collaboration with existing Biosphere reserves in thematic networks at the regional or international levels	68
	15.4.4 Collaboration with existing Biosphere reserves at the international level	68
16.	USES AND ACTIVITIES	69
	16.1 Core area(s)	69
	16.1.1 Describe the uses and activities occurring within the core area(s)	70
	16.1.2 Possible adverse effects on the core area(s) of uses or activities occurring within or outside the core area(s)	67
	16.2 Buffer zone(s)	70
	16.2.1 Describe the main land uses and economic activities in the buffer zone(s)	70
	16.2.2 Possible adverse effects on the buffer zone(s) of uses or activities occurring within or outside the buffer zone(s) in the near and longer terms	70
	16.3 Transition area	71
	16.3.1 Describe the main land uses and major economic activities in the transition area(s)	71
	16.3.2 Possible adverse effects of uses or activities on the transition area(s)	72

HOODED PLOVER *THINORNIS RUBRICOLLIS*

17.	INSTITUTIONAL ASPECTS	73
	17.1 State, province, region or other administrative units	73
	17.2 Units of the proposed Biosphere reserve	73
	17.2.1 Are these units contiguous or are they separate?	73
	17.3 Protection regime of the core area(s) and, if appropriate of the buffer zone(s)	73
	17.3.1 Core area(s)	73
	17.3.2 Buffer zone(s)	74
	17.4 Land use regulations or agreements applicable to the transition area (if appropriate)	75
	17.5 Land tenure of each zone	76
	17.5.1 Core area(s)	76
	17.5.2 Buffer zone(s)	76
	17.5.3 Transition area(s)	76
	17.5.4 Foreseen changes in land tenure	77
	17.6 Management plan or policy and mechanisms for implementation	77
	17.6.1 Year of start of implementation of management plan or land use policy	77
	17.6.2 Main features of management plan or land use policy and means of application	77
	17.7 Personnel	77
	17.7.1 Total number of staff of proposed Biosphere reserve	77
	17.7.2 Number of staff for administrative and resource management	78
	17.7.3 Number of national staff for research	78
	17.7.4 Number of technical support staff	78
	17.8 Financial source(s) and yearly budget:	78
	17.9 Authority in charge of administration	78
	17.9.1 The proposed biosphere reserve as a whole	78
	17.9.2 The core area(s)	78
	17.9.3 The buffer zone(s)	79
	17.9.4 Mechanisms of consultation and co-ordination among these different authorities	79
	17.10 Local organisational arrangements	79
	17.10.1 Extent to which local communities have been associated with the nomination process	79
	17.10.2 Local communities participation in formulation and implementation of the management plan or land-use policy	81
18.	SPECIAL DESIGNATIONS	82
19.	SUPPORTING DOCUMENTS	83
20.	ADDRESSES	85
	20.1 Contact address of the proposed Biosphere reserve:	85
	20.2 Administering entity of the core area:	85
	20.3 Administering entity of the buffer zone:	85
	LETTERS OF ENDORSEMENT	86
	Environment Australia	86
	Mornington Peninsula Shire Council	87
	Bass Coast Shire Council	88
	City of Casey	89
	Frankston City Council	90
	Cardinia Shire Council	91
	Department of Natural Resources and Environment	92
	Australian National Commission for UNESCO	93
	REFERENCES	95
	APPENDICES	99
	Appendix 1: Flora of national or State significance recorded in Stages 1 and 2 of the proposed Biosphere reserve	99
	Appendix 2: Fauna of national or State significance recorded in Stages 1 and 2 of the proposed Biosphere reserve	102
	Appendix 3: Species listed as migrator or marine under the EPBC Act	105
	BIBLIOGRAPHY	108
	ABBREVIATIONS	116
	MAP 1 Boundaries	
	MAP 2 Zoning	
	MAPS 3–6 Boundaries of marine National parks	

BIOSPHERE RESERVE NOMINATION FORM

Introduction

➔ *The text in this typeface, usually preceded by an arrow (as shown), is provided as a guidance in assisting the MAB National Committees and nominating authorities in completing particular sections of the form.*

➔ *Biosphere reserves are areas of terrestrial and coastal / marine ecosystems, or a combination thereof, which are internationally recognised within the framework of UNESCO's Program on Man and the Biosphere (MAB). They are established to promote and demonstrate a balanced relationship between humans and the biosphere. Biosphere reserves are designated by the International Co-ordinating Council of the MAB Program at the request of the state concerned. Individual Biosphere reserves remain under the sovereign jurisdiction of the state where they are situated. Collectively, all Biosphere reserves form a World Network in which participation by states is voluntary.*

The World Network is governed by the Statutory Framework adopted by the UNESCO General Conference in 1995, which presents the definition, objectives, criteria and the designation procedure for Biosphere reserves. The actions recommended for the future development of biosphere reserves in the 21st century are set out in the 'Seville Strategy', which was approved by the UNESCO General Conference. These documents should be used as basic references for the completion of this nomination form.

The information presented on this nomination form will be used in a number of ways by UNESCO:

(a) for examination of the site by the Advisory Committee on Biosphere reserves and by the Bureau of the MAB International Co-ordinating Council;

(b) for use in a world-wide accessible information system, notably the UNESCO-MABnet, facilitating communications and interaction among persons interested in biosphere reserves throughout the world.

The nomination form consists of two parts: Part One is a summary indicating how the nominated area responds to the functions and criteria for Biosphere reserves set out in the Statutory Framework, and presents the endorsements for the nomination from the authorities concerned. Part Two is more descriptive and detailed, referring to the human, physical and biological characteristics as well as to the institutional aspects. Among the supporting documents, please note that it is essential to provide a map clearly showing the zonation of the area.

MORNINGTON PENINSULA NATIONAL PARK



OVERVIEW OF NOMINATION

This nomination is based on the area comprising the Mornington Peninsula, the waters of Western Port, and the southern part of the Western Port water catchment in Victoria, Australia. It comprises all of the Mornington Peninsula Local Government Area (LGA), part of the Bass Coast, and Cardinia LGAs, and parts of the cities of Frankston and Casey. It also includes French Island which is unincorporated; that is, it has no local government, and instead is the direct responsibility of the State Government of Victoria. The total permanent population within Stage 1 is 180,000, with a seasonal population of approximately 270,000.

The total area covered by this nomination is approximately 2100 square kilometres and is referred to as Stage 1. Following successful establishment of this Stage 1, and further community consultation and acceptance by the State Government, all relevant local governments and other key stakeholders, the balance of the core and buffer areas in the Western Port catchment is proposed to be nominated to UNESCO as Stage 2 of the Biosphere reserve. This would increase the size of the Biosphere reserve to about 3400 square kilometres. The Stage 2 nomination may be as a single entity or in several parts, depending on the agreements reached with the local communities and land managers. The nomination is not considered as a high priority; however, this will be reviewed on a regular basis and will only proceed following extensive consultation and evaluation.

The boundaries of Stage 1 and Stage 2 are shown on Map 1.

This nomination aims to capture many of the features of the Seville vision for Biosphere reserves in the 21st century and forms part of the celebration of the 30th anniversary of the MAB program. In this context, the proposed Biosphere reserve will:

- Contribute to the implementation of numerous existing international agreements promoting conservation in Australia.
- Include a wide variety of environmental, biological, economic and cultural situations, incorporating largely undisturbed areas, and extending to include major towns and cities, and taking in coastal and marine environments.
- Strengthen the emerging regional, and thematic global components of the functioning World Network of Biosphere Reserves.
- Promote scientific research, monitoring, training and education.
- Contain an extensive and functional occurrence of all Biosphere reserve zones that fully reflect the natural and human dimensions of the area.
- Operate on the basis of open, evolving and adaptive relationships with all sections of the community to promote management that is culturally creative and ecologically, economically and socially sustainable.
- Promote an awareness and understanding through information exchange mechanisms, community capacity and network building, collaborative partnerships, education programs of sustainability and responsible stewardship of the area's ecosystems, resources and values.
- Promote a greater awareness and understanding of the history of the area, the traditional owners of the land and impacts of European settlement of the area and the recognition of rights and participation.

This nomination has wide community support. A major public consultation program has been undertaken in the Stage 1 area to increase public awareness about UNESCO Biosphere reserves. About 5000 brochures explaining the program have been distributed to State, local government, interest groups, and the community. In addition, there have been numerous public meetings and briefings, and this nomination has been widely distributed for public comment before finalisation. The overall program has been managed by a voluntary committee with community and government agency representation.

The area of nomination is ideal for the creation of a Biosphere reserve. For more than 30 years, it has been home to one of the earliest and consistently active networks of community conservation groups in Victoria. Numerous scientific studies of world standing have been undertaken in the area. The challenge is to use the results of these as a basis for achieving sustainable use of the area's natural and cultural resources. Managing urban growth in a sustainable manner and developing a culture of responsible stewardship by all community members is one of the key drivers of this proposal.

Some very significant industrial and commercial entities rely extensively on the natural resource base and locational attributes of the area. The Port of Hastings, which comprises the Crib Point oil terminal jetty, Long Island Point Pier, BHP Steel Industries wharf complex and Stony Point port services complex, provide an infrastructure support base to a range of industries and provides an important employment node in the Hastings area. There is highly productive agricultural land and important stone and sand deposits, which are also located in the transition zone of the proposed Biosphere area.

Several international treaties for conservation apply specifically to Western Port, its islands and surrounding landforms: the Ramsar convention on Wetlands of International importance, especially as waterfowl habitat (for water-bird habitat of international significance); the *Japan–Australia Migratory Birds Agreement, JAMBA*, a migratory bird protection agreement with Japan, and a similar agreement made with China, the *China–Australian Migratory Birds Agreement, CAMBA*.

The core and buffer areas described in this nomination are all publicly owned land and waters managed by either State or local government authorities.

The increasing emphasis by UNESCO on the transition zone is recognised in this nomination, since this is where the key issues on environment and development of a given region are to be addressed. The transition zone is by UNESCO definition not delimited in space, but rather is changing in size according to the problems that arise over time.

In this context, the biological resources described in this nomination extend to the whole of the Western Port catchment from the outset, because holistic catchment management is crucial to the sustainability of the natural resources within Stage 1. There also is the eventual intent to make a later nomination to UNESCO to include the balance of Western Port catchment as Stage 2 of the Biosphere reserve, subject to considered evaluation of such an extension.

The areas of the nomination are listed in Table 1 and shown on Map 1.

TABLE 1

AREA STATEMENT. MORNINGTON PENINSULA AND WESTERN PORT BIOSPHERE RESERVE (STAGE 1)

AREA (SQUARE KILOMETRES)				
COMPONENT	CORE ZONE	BUFFER ZONE	TRANSITION ZONE	TOTAL
TERRESTRIAL	93	135	1228	1456
MARINE	—	501	185	686
TOTAL	93	636	1413	2142

NOTE: THE COMBINED AREA OF STAGE 1 AND STAGE 2 IS ABOUT 3430 SQUARE KILOMETRES.

Recognising the above approach, flexibility will still exist to give any persons, especially land holders, the right to participate in the Biosphere program if they wish, whether inside Stage 1 or Stage 2, provided their activities comply with the program objectives, and are relevant to the given region.

All participation in Biosphere programs will be voluntary, and the existing legal rights and responsibilities of property owners remain unchanged. Similarly, the jurisdictional independence of governments will continue to be respected and upheld.

The administration of the Biosphere program will be through an incorporated non-statutory body established as a Foundation. The organisational arrangement will provide for the involvement and participation of land managers of the core and buffer areas, together with public authorities and trusts who provide funding and or other forms of support to assist in delivery of projects agreed by the Foundation. Local communities will participate and be represented through democratically elected representatives. It is anticipated that there will be a local Biosphere committee in each local government area and on French Island, and that these local committees will provide representatives to the Foundation. The Foundation and local committees will be established consistent with the principles set out in section 4.7.

The Victorian Government supports the Mornington Peninsula and Western Port Biosphere reserve nomination to UNESCO as one means of encouraging ecologically sustainable development (ESD) through increased community involvement recognising that it:

- will be community-driven, self-funded and based on voluntary participation by individuals;
- will not restrict uses that are consistent with state legislation, planning schemes or other government policies;
- is technically sound and has a sound governance and business framework.

Part I : Summary

1. PROPOSED NAME OF THE BIOSPHERE RESERVE

The Mornington Peninsula and Western Port Biosphere reserve.

The name selected for this proposal is the Mornington Peninsula and Western Port Biosphere reserve. In this nomination, it applies to the area recognised as the whole of the Mornington Peninsula, the lower part of the Western Port catchment, the Port Phillip and Bass Strait coastlines, together with the islands of Western Port (see Map 1, shaded area).

This is an interim name, pending continuing consultation with local communities, especially Aboriginal communities. Their strong attachment to the land reminds current occupiers of the very small period in time of European settlement. In discussing the proposal with representatives of the Aboriginal community, their support for this initiative is reflected in their response that: "We are happy because the land will be happy."

2. COUNTRY

State of Victoria, Australia.

3. FULFILMENT OF THE THREE FUNCTIONS OF BIOSPHERE RESERVES

3.1 CONSERVATION

➔ *Contribute to the conservation of landscapes, ecosystems, species and genetic variation*

The proposed Biosphere reserve is located immediately to the south-east of the capital city of Victoria, the city of Melbourne (population of over three million). The area contains biological values of international, national, state, and regional significance. These are mapped and described for Stage 1 and Stage 2.

In terms of the major ecosystem categories currently recognised by the MAB Program, the proposed Biosphere reserve includes: sub-tropical and temperate rainforests; evergreen sclerophyllous forests, woodlands or scrub; temperate grasslands; wetlands, mangroves, and marine ecosystems.

The reserve lies within the South-East Coastal Plain (Interim Biogeographic Regionalisation Zone for Australia).

RURAL LANDSCAPE, MORNINGTON PENINSULA



In the context of the State of Victoria, the proposed Biosphere reserve includes parts of the following biogeographic regions, termed bioregions by the State Government Department of Natural Resources and Environment (NRE 1997 & 2001a): These are the Gippsland Plain, Highlands–Southern Fall, Strzelecki, and the Victorian Embayments and Wetlands.

The Stage 1 bioregions collectively contain a unique combination of ecological values which give the area international, national, regional and local conservation significance as follows:

INTERNATIONAL

- Western Port, which is an area of great biological diversity due to its unusually wide range of habitat types, ranging from deep channels to seagrass meadows, mangroves, saltmarsh and melaleuca thickets. It has a large number of marine invertebrates, and about 65% of Victoria's bird species are present (NRE 1999).
- Wetlands listed under the *Convention on Wetlands of International Importance*, especially as waterfowl habitat (Ramsar Convention), and many of the migratory birds using the area are listed under international agreements, including JAMBA, CAMBA and the Bonn Agreement (Port Phillip CALP Board 2000).

NATIONAL

- French Island, especially the national park area, which is relatively undisturbed and is nationally significant, because it provides a continuous range of habitats for fauna, and is free of foxes.
- Many significant native plants and vegetation communities which include rare, threatened and vulnerable species (NRE 2000a, 2000b & 2001b).
- Numerous geomorphological sites (Rosengren 1984).
- Sites of zoological significance, including breeding colonies of Little Penguins, Koalas, Australian Fur Seals, Hooded Plover and Short-tailed Shearwaters (Andrew et al 1984, AHC 2002).

REGIONAL

- Regionally important remnant indigenous vegetation both in small reservations and on private land (Opie et al 1984, Port Phillip CALP Board 2000).
- Highly scenic landscape values and sites of historic importance (Seddon 1974, Sullivan 1981, Calder 1986, AHC 2002).

The creation of the Biosphere reserve will enhance the conservation of these biological resources by further integrating the management of the core areas, where many of the high biological values are located, with the protection provided by the buffer areas. Moreover, the encouragement of sustainable development and use practices in the transition zone, which is experiencing enormous pressures from urban growth and industrial expansion, will also greatly facilitate conservation.

LANDSCAPES

Four distinct landscape categories can be recognised within the proposed area. Each landscape category provides a setting of sufficient scale to maintain its natural and cultural integrity within the constraints of the degree of development undertaken.

The categories are as follows:

Largely Natural Landscapes (17% of Stage 1 area)

These less-disturbed areas are in public ownership as national parks, as well as other parks and state forests. The sustainability of these areas is possible due to their relative large size, and the intact and functional natural processes that are maintained through management intervention.

Rural Landscapes (44% of Stage 1 area)

These farm and pastoral landscapes are predominantly in private ownership. They are mainly used to produce food and fibre for local and export markets. Biodiversity assets in this environment persist as remnants of the original vegetation types and vary both in condition and extent.

Urban Built Landscapes (7% of Stage 1 area)


These comprise the urban and industrial landscapes created by cities and townships, of which many have industrial and infrastructure components such as transport, power, port facilities, water supplies and waste disposal.

Largely Natural Seascapes (32% of Stage 1 area)

All of the seascapes are publicly owned and the legislative responsibility of State or local government. The largest seascape entity in the Biosphere reserve is Western Port, a large bay, which covers 680 square kilometres and contains two large islands and several smaller ones. This seascape offers an incredibly rich diversity of flora, fauna and ecosystems within terrestrial and marine habitats along a compact and variably accessible coastline. The southern coastline of Australia is the only very extensive south-facing ocean coastline in the world.

The natural beauty of the coastal areas is recognised and acknowledged as worthy of conservation (Seddon 1974, Bird 1993, AHC 2002, www.vcc.vic.gov.au/landscape/index.htm).

3.2 DEVELOPMENT

 *Foster economic and human development
which is socio-culturally and ecologically sustainable.*

Economic and human development that is socio-culturally and ecologically sustainable will be fostered through creating partnerships with government, industry and the community. The aim is to develop social capital involving information exchange, education, research, evaluation, communication and monitoring of the environment. The potential for this is enhanced by the national importance of the area for industry, port operations, fishing, agriculture, tourism, and major growth corridors for urban development. Ecotourism, renewable resource development, sustainable agriculture, biodynamic farms, mixed forest plantations and bioceutical products foster human development in a sustainable manner.

The major issues in the proposed Biosphere reserve region are about the pressure that human developments place on the area's ecosystems, on which the regional productivity, people's wealth and lifestyles depend. These interrelated issues, the result of human activity, include:

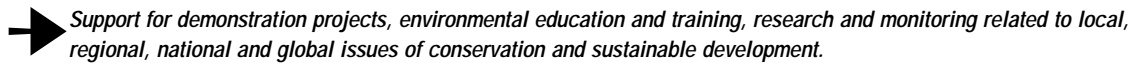
- Threat of pollution and waste (land, water and air).
- Deterioration in water quality.
- Land degradation.
- Balance between urbanisation and maintenance of rural character and landscape quality in coastal areas.
- Impacts from industrial and tourism infrastructure and activities.
- Disruption to marine habitat, loss of seagrass and reduction in fish stocks.
- Introduction of exotic terrestrial and marine organisms.
- Unemployment.
- Protection of natural resources, including farmland from inappropriate urban development.
- Identification and preservation of land stocks for urban development.
- Protection of port-related land and infrastructure to ensure future options are not discounted due to inappropriate development and short-term decisions.
- Inappropriate drainage and water quality, which adversely impacts on the natural values of Western Port and Port Phillip Bay and fish stocks.
- Development impacts on areas of cultural and heritage value.

A single planning process cannot provide solutions to all these issues. However, Biosphere reserve programs will be used to achieve synergies and greater integration of data collection and dissemination, development of responses, and promotion of a stronger

commitment to pursuing balanced outcomes through establishing a regional framework supported directly by the community. This community support is expected to enhance the numerous Commonwealth, State and local government programs already in place.

The creation of the Biosphere reserve does not change the status of any existing legal activities. It encourages willing participants to form voluntary partnerships to enhance sustainable development.

3.3 LOGISTIC SUPPORT



There is a comprehensive system of existing and potential facilities and services, which provide a framework to encourage and promote Biosphere programs. These include:

Existing

- Over 100 environmental associations and friends groups, and other volunteers actively involved in conservation programs in parks and reserves.
- Numerous visitor and community information centres, providing promotional material, etc.
- Many primary, secondary and tertiary education institutions, conducting programs related to conservation.
- University and government research institutions, including Phillip Island Nature Park research, which has a dedicated focus on the region's long-term sustainability.
- Extensive Landcare and Land for Wildlife programs, providing enormous and widespread demonstration potential for encouraging sustainable use of natural resources on private land, through information exchange and support networks.
- Port of Hastings national demonstration project to manage the risks from marine pests in ships' ballast waters, within the context of coast and marine sustainability.
- Farming groups with sustainable codes of practice for farming activities being adopted by the Victorian Farmers Federation, and a large percentage of farmers participating in the Landcare program.
- Environmentally friendly vegetable produce and winegrowing programs.
- Seagrass restoration and sedimentation projects, tied in with broader, marine management strategies.
- Local community radio (3RPP) weekly broadcasting the two-hour *Biosphere Program*, discussing issues of sustainability.
- Regional waste management committees.

Proposed

- Promoting the creation of a regional research institute, which investigates local, national and global issues of sustainability.
- Networking of information via existing information centres, such as tourism information kiosks, libraries, community networks, newsletters, e-mail and web sites with interactive access.
- Accrediting programs under which land and water uses, which meet specified criteria for sustainability. This accreditation will be promoted for its marketing value in sales of products and services.
- Establish a public fund committee to attract significant funding to the reserve through grants, sponsorship and other mechanisms.
- Investigating and promoting the use of energy conservation measures to enhance sustainable use of resources.
- Facilitating demonstration projects and the encouragement of education programs that promote the benefits of sustainable use of natural resources.
- Encouraging the introduction of new clean and green industries that are consistent with sustainable use of natural resources.

- Encouraging sustainable development of ecotourism opportunities as a means of increasing awareness of the synergies between tourism and the environment while expanding regional employment.
- Developing a comprehensive set of regional environmental performance indicators, which allow measurement of improvement of the environment of the area, and achieve widespread public appreciation of the significance of these indicators.
- Developing voluntary partnerships with industry sectors to identify and promote research, develop performance measures and improve information dissemination, which enhances community knowledge and support for preserving important resources necessary for underpinning the economic development of the area and contributing to the State's economy.
- Developing simple voluntary codes of practice covering recreation use of terrestrial and marine ecosystems.
- Forging a close working arrangement with a "sister" Biosphere reserve overseas, which has similar challenges. This arrangement would include exchange of expertise, development of training opportunities, and enhancing ecotourism (nature based) activities.
- Establishing a global monitoring station, which forms part of an international network, and include climate change impacts.
- Developing a comprehensive communication strategy to build and maintain community interest.
- Establishing "biological filters" and environmental safeguards to reduce the impact of pollution on core areas.
- Promoting sustainable land use practices within industry, agriculture and tourism, leading to models of sustainable practice within the Biosphere reserve.
- Creation of a library to reference and house ongoing data collected in the Biosphere program. This material is to be readily accessible to the public.
- Identifying key factors contributing to environmental degradation and unsustainability.
- Operating a Biosphere awards program for business and community with a focus on promoting and enhancing the functions of the Biosphere.

The above existing and proposed logistical infrastructure should provide comprehensive support to address local, regional, national and global issues of conservation and sustainable development within the Biosphere reserve and encourage participation in sustainability programs.

MORNINGTON PENINSULA NATIONAL PARK



4. CRITERIA FOR DESIGNATION AS A BIOSPHERE RESERVE

➔ *Article 4 of the Statutory Framework presents seven general criteria for an area to be qualified for designation as a Biosphere reserve, which are given in order below.*

4.1 “ENCOMPASS A MOSAIC OF ECOLOGICAL SYSTEMS REPRESENTATIVE OF MAJOR BIOGEOGRAPHIC REGIONS, INCLUDING A GRADATION OF HUMAN INTERVENTION”

➔ *The term “mosaic” refers to a diversity of natural habitats and land cover types derived from human uses such as fields, managed forests, etc. The term “major biogeographic region” is not strictly defined, but it would be useful to refer to the map of the World Network of Biosphere Reserves, which presents major ecosystem types at a global scale.*

The extensive complex of species and ecosystems within the major national and Victorian bioregions and landscapes outlined in Section 3 (above) spans a full spectrum of human intervention. This provides an opportunity to create a model of global importance for promoting and demonstrating a sound balance between human development and sustaining the Biosphere reserve.

The area includes numerous biological communities over an extensive geographical area that is centred on a marine bay. The terrestrial component of the proposed Biosphere reserve consists of a peninsula separating Western Port and Port Phillip Bay, and the southern part of the catchment of Western Port; together with several islands within Western Port. The geomorphology of the bays and the catchments has led to the creation of an unusual variety of microclimates and ecosystems within a defined geographical region (Calder 1986, AHC 2002).

It includes a mosaic of terrestrial vegetation communities, wetlands (both saline and freshwater), river estuaries, coastal ecosystems, islands, intertidal communities and a range of marine habitats. The resulting mosaic of zones and subtly different microhabitats within them has created a larger system of great biological diversity. Western Port is characterised by the diversity, extent and often unusual nature of its vegetation and animal communities (Shapiro 1975, AHC 2002).

4.2 “BE OF SIGNIFICANCE FOR BIOLOGICAL DIVERSITY CONSERVATION”

➔ *This should refer not only to the numbers of endemic species, or rare and endangered species at the local, regional or global levels, but also to species of globally economic importance, rare habitat types or unique land use practices (for example traditional grazing or artisanal fishing) favouring the conservation of biological diversity. Give only a general indication here.*

The coastline and hinterland of the Western Port catchment support some of Victoria’s most valuable natural areas. The intertidal mud flats and mangroves comprise one of 11 areas in Victoria listed under the Ramsar Convention. The bay area also provides habitat for 43 migratory bird species, which are protected under Australia’s international treaties with Japan and China (JAMBA and CAMBA), and under the Bonn Agreement (Port Phillip CALP Board 2000).

There are no longer unique traditional land use practices employed to favour the conservation of biological diversity. However, prescribed use of fire is used to maintain biological diversity, especially in heath land vegetation (Boura 1994). Of the original estimated area of native vegetation, about 8% (Stage 1) still survives. Protection, restoration and rehabilitation of native vegetation, and restrictions on land clearing (voluntary and legislated), are the main measures to maintain and enhance biological diversity (Port Phillip CALP Board 2002).

Western Port has an unusually wide range of habitat types including deep channels, extensive seagrass meadows, mangroves and saltmarshes. Two-thirds of Victorian bird species have been recorded in the bay (AHC 2002). Much of the significant decline in biodiversity is reflected in reduced types and numbers of fish, birdlife, water quality and habitat quality, and has been linked to the loss of intertidal seagrass habitat. It has been suggested that this may be linked to pollution, increased water turbidity and other impacts arising from adjacent land and water use (EPA 1995). Improved land catchment management and increase in protected areas are the main actions likely to arrest decline in marine biodiversity.

Western Port is representative of the many marine and coastal habitats (particularly intertidal habitats) that are now rarely found on the southern Australian coast on such a scale. In addition to coastal wetlands, there are a number of inland swamps that are important habitats and ecosystems, and support a wide range of native fauna (NRE 1999).

For these reasons, the salt marshes and wetlands of Western Port are considered to be of national and international significance.

The diversity of taxonomic groups, and in particular the species of invertebrate fauna represented in the marine environment of Western Port, is remarkable. Of the invertebrate fauna studied to date, 23 major groups and 1381 species have been identified. This is three to four times the number of species known in nearby Port Phillip Bay (NRE 1999). It is estimated that these recorded species represent only approximately half of the total numbers of species of invertebrates actually inhabiting Western Port (Shapiro 1975, AHC 2002). A large

healthy colony of brachiopods was recently discovered near Churchill Island in Western Port (*The Mail*, Mornington, 28 March 2002).

Many plants in the Western Port region are known to show great adaptation to subtle differences in site, and significant genetic variation has been demonstrated in some species from site to site (Calder 1986). Unusual flora and fauna communities may also be found in many remnant pockets of vegetation (both large and small) and even some of the smaller, more limited sites have been recognised for their botanical or zoological significance (Andrew et al 1984, Opie et al 1984).

Floristically unusual, rare communities, and rare plants can still be found within the region (Opie et al 1984, Calder 1986). For example, over 60 species of orchids and 10 species of eucalypts can still be found on the Mornington Peninsula (Calder 1986, WPPC 1980). Many of these eucalypt species show great genetic diversity in adaptation to very specific sites and localities (Calder 1986).

Australia has a unique mammal population of which many are shy and nocturnal and, therefore, it may be difficult to detect their presence or to estimate numbers. However, almost 50% of the terrestrial mammals native to Victoria have been recorded to be present in the Western Port catchment area (WPPC 1980, AHC 2002).

Sites of zoological significance in Western Port include six sites of national significance, six sites of State significance, and five sites of regional significance (Andrew et al 1984, Lumsden 1992). Western Port is also one of the three most important areas for migratory waders in Victoria with respect to total numbers of birds present and the population density (NRE 1999, AHC 2002).

4.3 “PROVIDE AN OPPORTUNITY TO EXPLORE AND DEMONSTRATE APPROACHES TO SUSTAINABLE DEVELOPMENT ON A REGIONAL SCALE”

➔ *Describe in general terms the potential of the area to serve as a pilot site for promoting the sustainable development of its region or “eco-region”.*

The proposed Stage 1 of the Biosphere reserve has a permanent population of about 180,000 people. Within this area, there are approximately 300 vineyards, a steel mill, oil depot, gas refractionation plant, operating specialist port, and numerous service industries and agricultural activities. The tourist industry generates hundreds of millions of dollars per annum and provides a growing employment base (Nicholson 1995, Tourism Victoria 1996, Urban Enterprises 1999 & 2000). Various government agencies are working in partnership with the vigneron, developing a code of practice and environmental management plan to assist them address issues of community concern relating to vineyard management and wine production (Carroll 2001, MPVA – In press).

LEADBEATER'S POSSUM *GYMNOBELIDEUS LEADBEATERI*



A similar approach has been pursued with the poultry industry, which is also a very significant industry in this area, with approximately 70% of all Victorian poultry farms located in the area and producing an estimated income of \$350 million (Broiler Code 2001). The Biosphere proposal provides an increased incentive to broaden these partnerships and increase the number of activities involved, and thereby demonstrate practical application of sustainability principles across activities within this area. The Biosphere reserve also provides an opportunity to enhance the quality of core areas by negotiating agreements with property owners to expand buffer zones. This will limit adverse impacts on the core areas, and improve their sustainability for future generations with monitoring of improvements to these areas over time.

Most of the proposed Biosphere reserve is within 90 minutes' drive of the Melbourne central business district. This reserve area provides Melbourne with an extremely important recreation and conservation resource on its doorstep. The opportunities and the necessity for this area to support sustainable development underpin the rationale for pursuing this Biosphere reserve proposal. The local community understands the importance of carefully planning and managing this area's unique resources so that present and future generations will continue to enjoy the benefits, natural attributes and resource base of this area.

The significance of this area to Melbourne has also been acknowledged in local and State planning policies (DOI 2002, Kellock & Associates 2000). The importance of the area is expected to be reconfirmed in the new Melbourne Metropolitan Strategy. This is a major strategic planning initiative aimed at providing guidance for managing Melbourne's growth into the 21st century. It is also recognised in both former State Government Statements of Planning Policy 1 & 2 (Govt. of Victoria 1970a & 1970b), which are now incorporated into the Mornington Peninsula Planning Scheme (DOI 2002). Many research documents have been prepared over the past 35 years that highlight the significance of this area, and also the range of development pressures to which it is subject (Champion 1974, ERA 1974, Seddon 1974, Shapiro 1975, LCC 1991 & 1993).

The area, therefore, has enormous potential further promote sustainable development. The attributes that contribute to this potential include:

- An informed and aware community consisting of numerous volunteer groups with a long history of active engagement in environmental and conservation programs.
- A comprehensive system of existing and proposed support facilities (as outlined in section 3.3 above) to increase public awareness about opportunities to develop models to promote sustainable practices.
- Potential for eventual use of catchment boundaries (Stage 2) as the outer limits of the transition area for natural area management purposes, so that downstream benefits of improved land practices across the catchment can be identified and promoted.
- Extensive occurrence and diversity of several ecosystems, so that models have wider relevance to promote regional sustainability.
- Existence of a high degree of relative lack of human disturbance in core areas (and buffer areas to a lesser extent), that provide excellent benchmarks for identifying and moderating human impacts in transition areas.
- Extensive rural and urban areas that create opportunities for building strong links between the producers and the consumers in the Biosphere reserve.
- Diversity of industries and a significant port and port-related area, which has been identified as a long-term option for further development, recognising its location, proximity to Melbourne and the environmentally sensitive area of Western Port.
- Extensive natural resource base, such as rock for the building and construction industry, and productive farm land, which is required to support the urban population of Melbourne and also contribute to the national economy through exports from the area.
- Significant land stocks within a number of townships, which are currently designated for future urban growth.
- There are important transport corridors connecting the area with metropolitan Melbourne and the Melbourne Transport Hub.
- There is considerable public infrastructure within the area, which has the ability to enhance opportunities for sustainable economic development.
- Important fisheries in Western Port, Port Phillip Bay and Bass Strait, which provide significant food for both the local and export markets.
- Active industry representatives and communities, which have the capacity and willingness to participate in programs that enhance sustainable outcomes, recognising economic, community and environmental goals.

4.4 “HAVE AN APPROPRIATE SIZE TO SERVE THE THREE FUNCTIONS OF BIOSPHERE RESERVES”

➔ *This refers more particularly to (a) the surface area required to meet the long-term conservation objectives of the core area(s) and the buffer zone(s); and (b) the availability of areas suitable for working with local communities in testing out and demonstrating sustainable uses of natural resources.*

The nominated Biosphere reserve (Stage 1) extends over about 686 square kilometres of marine area and 1456 square kilometres of terrestrial area.

These areas are large enough to promote the long-term conservation objectives of the core and buffer areas. The large area size and population in the transition area is more than adequate for working with local communities in testing and demonstrating sustainable uses of natural and cultural resources.

4.5 THROUGH APPROPRIATE ZONATION

The terrestrial core and buffer zones within the proposed Biosphere reserve (Stage 1) comprise areas of national parks, state parks, a nature park and other conservation reserves, all reserved in public ownership. These areas have outstanding natural and cultural values. The system of Biosphere reserve zoning adopted (see Map 2) identifies the interior sections of the larger sections of these parks as core areas, which are bounded by buffer areas in each instance, to protect the core areas. Also designated as buffer areas are the small isolated units of parks or long narrow strips of parks and reserves, especially in coastal areas. Voluntary co-operative arrangements with adjacent holders of privately owned land will be sought to progressively extend the size of buffer areas, perhaps leading to the creation of more core areas on public land in the longer term. Buffer areas may come under conservation covenants to ensure enduring conservation management if the landholder so wishes.

There were no marine core zones at the time of nomination of the Stage 1. The recent successful passage of marine parks legislation (13 June 2002) will result in the inclusion of the marine parks in Stage 1 following their declaration on 16 November 2002. These will include Churchill Island Marine National Park, Yaringa Marine National Park and French Island Marine National Park. More information about their boundaries can be found in Maps 3–6 of this document, and at the Department of Natural Resources and Environment Web site, www.nre.vic.gov.au. Ramsar sites in Western Port have been identified as buffer zone, except that all shipping channels and associated areas (see Map 2), have been excluded so as to be part of the overall transition area of Stage 1.

➔ *(a) A legally constituted core area or areas devoted to long-term protection, according to the conservation objectives of the Biosphere reserve, and of sufficient size to meet these objectives.*

Describe the core area(s) briefly, indicating their legal status, their size, and the main conservation objectives.

The following include the core areas of the Biosphere reserve with management objectives extracted from the relevant park management plans. The total size of core areas is 9300 hectares.

NATIONAL PARKS, STATE PARKS AND CONSERVATION RESERVES

CORE AREAS (Will also be included in the buffered areas)

- Arthurs Seat State Park.
- French Island National Park.
- Grantville Nature Conservation Reserve.
- Langwarrin Flora and Fauna Reserve.
- Mornington Peninsula National Park.
- North Western Port Nature Conservation Reserve.
- The Gurdies Nature Conservation Reserve.
- Quail Island Reserve.

These parks are public land managed by the State Government of Victoria, permanently reserved under the *National Parks Act 1975*. The other conservation reserves are permanently reserved Crown land under the *Crown Land (Reserves) Act (1978)*.

The park and reserve management aims are as follows:

- Preserve, protect and enhance the natural environment.
- Maintain, and where possible, enhance remote and natural values.
- Allow natural environmental processes to continue with the minimum of interference.
- Maintain biodiversity.
- Conserve features of archaeological, historical and cultural significance.
- Protect human life, the park, and adjacent lands from fire.
- Eradicate or otherwise control introduced plants, animals and diseases.
- Provide opportunities for appropriate recreation and tourism.
- Promote and encourage an appreciation and understanding of the park's natural and cultural resources.
- Provide for and encourage scientific research.

NATURE PARK

Phillip Island Nature Park

This park is reserved under the *Crown Land (Reserves) Act 1978* for "the conservation of areas of natural interest and beauty, or of scientific, historical archaeological interest".

The vision for the park is "International Excellence in Nature Conservation and Ecotourism".

The park objectives include:

- Preserve and protect natural and cultural values.
- Undertake high quality research.
- Provide world-renowned and high-quality ecotourism experiences.
- Provide high-quality coastal recreational experiences and supporting facilities.
- Provide high-quality education, information and interpretations.
- Implement sound and socially responsible business management practices.

There are four core areas in this park comprising sections of the Summerland, Oswin Roberts–Rhyll, Churchill Island, and Woolamai precincts.

➔ (b) A buffer zone or zones clearly identified and surrounding or contiguous to the core area or areas, where only activities compatible with the management objectives can take place ...

Describe briefly the buffer zones(s), their legal status, their size, and the activities which are ongoing and planned there.

The total area of the buffer areas is 63,600 hectares. As indicated above, the buffer zones initially are reserved and managed in public ownership. In the case of terrestrial areas, there is the opportunity for the inclusion of private land where the owner so wishes.

The following areas and reserves are included in the buffer zone.

Balcombe Creek Bushland Reserve
 Bald Hill Nature Conservation Reserve
 Balnarring Bushland Reserve
 Bass River Streamside Reserve
 Bittern Bushland Reserve
 Buckley Nature Conservation Reserve
 Coolart Historic Area
 Corinella Bushland Reserve
 Corinella Cemetery Bushland Reserve
 Cranbourne Botanic Gardens

Crib Point Bushland Reserve
 Dromana Bushland Reserve
 Fossil Beach Geological Reserve
 French Island Bushland Reserve
 Grantville Bushland Reserve
 Hurdy Gurdy Creek Wildlife Reserve
 Kangerong Nature Conservation Reserve
 Koonwarra Flora Reserve
 Lang Lang Bushland Reserve
 Lang Lang Education Area
 Lang Lang Nature Conservation Reserve
 Main Ridge Nature Conservation Reserve

Moorooduc Bushland Reserve
 Mount Martha Nature Conservation Reserve
 Mud Islands Wildlife Reserve
 Nyora Nature Conservation Reserve
 Reef Island and Bass River Nature Conservation Reserve
 Tubba Rubba Creek Bushland Reserve
 Tyabb Bushland Reserve
 Ventnor Bushland Reserve
 Wannaeue Bushland Reserve
 Warringine Park
 Yannathan Bushland Reserve

The marine buffer zone based on the Western Port Ramsar site (excluding shipping channels and associated areas and facilities) has the following proposed conservation management objectives (Parks Victoria 2002):

- Increase the scientific understanding of wetland ecosystems and their management requirements.
- Maintain or seek to restore appropriate water regimes.
- Address adverse processes and activities.
- Manage within an integrated management framework.
- Manage resource utilisation on a sustainable basis.
- Protect and, where appropriate, enhance ecosystem processes, habitats and species.
- Encourage strong partnerships between relevant agencies.
- Promote community awareness and understanding and provide opportunities for involvement in management.
- Ensure recreational use is consistent with the protection of natural and cultural values.
- Develop ongoing consistent programs to monitor ecological character.

The legal status of the buffer zone therefore is land or waters reserved in public ownership under the *National Parks Act, Crown Land (Reserves Act), Wildlife Act, Land Act* and other legislation where appropriate.

➔ *(c) An outer transition area where sustainable resource management practices are promoted and developed. The Seville Strategy gave increased emphasis to the transition area, since this is the area where the key issues on environment and development of a given region are to be addressed. The transition area is, by definition, not delimited in space, but rather is changing in size according to the problems that arise over time. Describe briefly the transition area as envisaged at the time of nomination, the types of questions to be addressed there in the near and the longer terms. The size should be given only as an indication.*

The total area of the transition area is approximately 1415 square kilometres. The transition area covers most of the proposed Biosphere reserve with a very substantial extent of terrestrial and marine areas. The marine areas are required to provide a full range of shipping, industrial and recreation uses.

Similarly, the terrestrial areas contain a wide variety of agricultural and industrial uses, together with some of the fastest-growing areas of urbanisation and development in Australia. The greatest challenge is to achieve sustainable use of the area's natural and cultural resources while balancing the economic and social needs of the community.

Private land in the transition zone is subject to an existing comprehensive legislative and policy framework implemented by all levels of government (eg, planning schemes). The creation of the Biosphere reserve does not alter in any way the legal rights or obligations of property owners, nor will it affect the existing frameworks.

Sustainable resource management practices are promoted through a number of programs, including voluntary conservation covenants, Land for Wildlife, Landcare, extension work by State and local government officers and many other programs.

PHILLIP ISLAND NATURE PARK



4.6 “ORGANISATIONAL ARRANGEMENTS SHOULD BE PROVIDED FOR THE INVOLVEMENT AND PARTICIPATION OF A SUITABLE RANGE OF INTER ALIA PUBLIC AUTHORITIES, LOCAL COMMUNITIES AND PRIVATE INTERESTS IN THE DESIGN AND THE CARRYING OUT OF THE FUNCTIONS OF A BIOSPHERE RESERVE”

Many of these arrangements are in place and more are foreseen. All core areas and initial buffer areas are land in public ownership managed primarily for conservation purposes under a State Act of Parliament (eg, *National Parks Act 1975*). This means that management is the responsibility of the State Government, which fulfills this role with the involvement of local government and the community. The Commonwealth Government has an interest, because much of the buffer in Western Port is listed as a Ramsar site.

In the longer term, private land owners will be encouraged to be added to buffer areas through voluntary co-operative arrangements. If the owners wish, these arrangements may be reinforced by conservation covenants applied to the ownership title of such land, or other agreements that provide enduring commitments to the protection of the natural and cultural values. Benefits may include performance-based rate and tax relief, and assistance with management plans and Landcare projects.

The very large transition area is mostly in private ownership. The legal rights or responsibilities of these owners are not changed in any way as a result of the Biosphere reserve designation. Organisational arrangements will be provided for the involvement and participation of a suitable range of public authorities, local communities and private interests in the design and the carrying out of the functions of a Biosphere reserve. The primary focus will be to inform, educate and facilitate local communities and industries in furthering the conservation and enhancement of the biological diversity of their environment.

At present there is an interim advisory committee established to facilitate the preparation of this nomination and promote the value of the Biosphere reserve to the region. It includes representatives of the community, together with those from State and local governments. Industries in the area have also been engaged in discussions, together with community groups and individuals. Following successful nomination, the administrative structure to operate the Biosphere reserve will be established (see next section).

GREENS BUSH, MORNINGTON PENINSULA NATIONAL PARK



4.7 MECHANISMS FOR IMPLEMENTATION

It is envisaged that the project will not generate the need for a large administrative structure; the focus will be on project outcomes mostly in partnership with other agencies. It will not be a planning reference body, involved in land-use planning deliberation or discussions, but will obviously make information available when requested.

The Mornington Peninsula and Western Port Biosphere Foundation will formulate a Biosphere strategy and facilitate, promote and support Biosphere programs. The administrative structure of the Foundation will be democratic, inclusive, accessible and reflective of local communities. This Foundation will include representatives of State and local government, industry and the community, and have access to the provision of expertise covering the interests of:

- Conservation.
- The indigenous community.
- Education, employment and training.
- Research.
- Industry.
- Ecotourism.
- Communication and marketing.
- Sustainable use of resources.

The Biosphere Foundation will have a Public Fund Committee. The role of this committee will be to manage funding of Biosphere programs and attract donations, grants, sponsorships, and other sources. A salaried project officer will assist in the creation of partnerships and the implementation of projects.

The Biosphere reserve will be divided into six units, based mainly on local government area boundaries and French Island. Each of these units will have a local committee charged with creating and furthering Biosphere programs via the Biosphere Foundation.

Principles to guide the creation of an administrative body after creation of the reserve are as follows:

- Develop organisational models in consultation with the community and local and State governments.
- Make arrangements flexible enough to provide for the eventual expansion of the Biosphere reserve if and when sought.
- Commit all organisational activities to be voluntary arrangements without any statutory enforcement.
- Have a primary role of creating partnerships to promote and facilitate conservation and ecologically sustainable development, and the use of natural and cultural resources.

■ Establish an organising body, which has the following general features:

- ◆ be an incorporated body with tax deductibility status;
- ◆ be co-ordinated by a small committee comprising elected representatives of the community and State and local government agencies, with responsibilities for core and buffer areas;
- ◆ operate to a constitution, which commits operations to democratic processes, sustainability goals, sound governance and community participation;
- ◆ rely primarily on community action within each local government authority boundary and French Island for development and implementation of programs;
- ◆ arrange mechanisms to ensure access to sound technical advice;
- ◆ seek funding from a wide range of sources, including charitable foundations; and
- ◆ provide for voluntary participation of a full range of interests covering the delivery of environmental, economic and social programs.

➔ ***Does the proposed Biosphere reserve have:***

(a) Mechanisms to manage human use and activities in the buffer zone or zones?

Yes. Management of human use in the core and buffer zones (public land) is provided by consultative planning processes backed by the existing regulatory enforcement, in accordance with approved management plans. Management plans are the product of consultative planning processes and these areas are permanently protected under existing legislative and institutional frameworks.

(b) A management plan or policy for the area as a Biosphere reserve?

Planned. It is envisaged that the planned implementation of programs in the Biosphere reserve will take into account the existing strategies and activities of government on the one hand, and the creation of new and innovative projects initiated and supported by the community on the other.

(c) a designated authority or mechanism to implement this policy or plan?

Planned. A non-statutory Biosphere Foundation, as indicated above, will arrange co-operative programs mainly through the vehicle of voluntary partnerships.

(d) Programs for research, monitoring, education and training?

Describe briefly research/activities monitoring (ongoing or planned) as well education and training activities.

Yes. Planned

A large body of research has been undertaken within the proposed Biosphere reserve. The data on biological resources, in particular, are very extensive. These provide an ideal basis for setting of benchmarks for future monitoring. The wide involvement of government and university institutions, together with strong community and industry support, are expected to provide further research and advanced monitoring. These systems can be assisted by use of geographical information systems and remote sensing technology.

A long-term goal is to facilitate the creation of a regional research institute, which focuses on enhancing social and environmental sustainability. It may also contribute to global monitoring and information exchange networks in the longer term.

5. ENDORSEMENTS (SEE ATTACHED LETTERS)

5.1 SIGNED BY THE AUTHORITY / AUTHORITIES IN CHARGE OF THE MANAGEMENT OF THE CORE AREA(S):

Full name: The Hon. Sheryl Garbutt, MP

Title: Minister for Conservation and Environment, Government of Victoria

Date:

(See Letter of Endorsement)

5.2 SIGNED BY THE AUTHORITY / AUTHORITIES IN CHARGE OF THE MANAGEMENT OF THE BUFFER ZONE(S):

Full name: The Hon. Sheryl Garbutt, MP

Title: Minister for Conservation and Environment, Government of Victoria

Date:

(See Letter of Endorsement)

5.3 SIGNED AS APPROPRIATE BY THE NATIONAL (OR STATE OR PROVINCIAL) ADMINISTRATION RESPONSIBLE FOR THE MANAGEMENT OF THE CORE AREA(S) AND THE BUFFER ZONE:

Full name: The Hon. Sheryl Garbutt, MP

Title: Minister for Conservation and Environment, Government of Victoria

Date:

(See Letter of Endorsement)

5.4 SIGNED BY THE AUTHORITY / AUTHORITIES, ELECTED LOCAL GOVERNMENT RECOGNISED AUTHORITY OR SPOKESPERSON REPRESENTATIVE OF THE COMMUNITIES LOCATED IN THE TRANSITION AREA.

Endorsed by five municipalities (see attached Letters of Endorsement)

Full name: Michael Kennedy

Title: Chief Executive Officer, Mornington Peninsula Shire Council

Date: 16 November 2001

Full name: Allan Bawden

Title: Chief Executive Officer, Bass Coast Shire Council

Date: 21 March 2002

Full name: Mike Tyler

Title: Chief Executive Officer, City of Casey

Date: 12 April 2002

Full name: Jon Edwards

Title: Chief Executive Officer, Frankston City Council

Date: 17 April 2002

Full name: Geoff Rundell

Title: General Manager of Community Planning, Cardinia Shire Council

Date: 22 April 2002

5.5 SIGNED ON BEHALF OF THE MAB NATIONAL COMMITTEE OR FOCAL POINT:

Full name: Peter Cochrane

Title: Director of National Parks Environment Australia

Date: 30 April 2002

ENDORSED BY THE AUSTRALIAN NATIONAL COMMISSION FOR UNESCO

Full name: Professor Ken Wiltshire, AO

Title: Chairman, Australian National Commission for UNESCO

Date: 22 March 2000

Part II: Description

6. LATITUDES AND LONGITUDES OF AREA

➔ *Indicate in degrees, minutes, seconds. Indicate co-ordinates of the central point of the proposed Biosphere reserves and if possible, the outer limits of the buffer zone.*

Centre:	Latitude:	-38° 20' 00"
	Longitude:	145° 20' 00"
Lower left:	Latitude:	-38° 35' 00"
	Longitude:	144° 40' 00"
Upper right:	Latitude:	-38° 10' 00"
	Longitude:	145° 40' 00"

7. SIZE AND SPATIAL CONFIGURATION (see Map 2 Stage 1)

7.1 SIZE OF TERRESTRIAL CORE AREA(S)

9300 hectares;

If appropriate, size of marine core area(s):

0 hectares.

7.2 SIZE OF TERRESTRIAL BUFFER ZONE(S)

13,500 hectares;

If appropriate, size of marine buffer zone(s):

50,100 hectares.

7.3 APPROXIMATE SIZE OF TERRESTRIAL TRANSITION AREA(S) (IF APPLICABLE)

122,800 hectares;

If appropriate, approximate size of marine transition area(s):

18,500 hectares.

7.4 BRIEF RATIONALE OF THIS ZONATION (IN TERMS OF THE VARIOUS ROLES OF BIOSPHERE RESERVES) AS IT APPEARS ON THE ZONATION MAP

The core and buffer zones within the proposed Biosphere reserve comprise areas of national and state parks, and other conservation reserves and a nature park, all reserved in public ownership. These areas have outstanding natural and cultural values. The system of Biosphere reserve zoning adopted (see Map 2) identifies the interior sections of the larger sections of these parks as core areas, which are bounded by buffer areas in each instance, to protect the core areas. In the case of small isolated units of parks or long narrow strips of parks, especially in coastal areas, these also are designated as buffer areas. Voluntary co-operative arrangements with adjacent holders of privately owned land will be sought to progressively extend the size of buffer areas, perhaps leading to the creation of more core areas on public land in the longer term. Buffer areas may come under conservation covenants to ensure enduring conservation management if the landholder so wishes. The creation of new marine national parks and marine sanctuaries will be added to create marine core areas.

8. BIOGEOGRAPHICAL REGION

➔ *Indicate the generally accepted name of the biogeographical region in which the proposed Biosphere reserve is located. You may wish to refer to the map of the World Network of Biosphere reserves presenting major ecosystem types.*

In the context of the map of the World Network of Biosphere Reserves presenting major ecosystem types, the proposed Biosphere reserve is located within “evergreen sclerophyllous forests, woodlands or scrub”.

In terms of the major ecosystem categories currently recognised by the MAB Program, the proposed biosphere reserve includes the following:

ECOSYSTEM CATEGORY	DISTRIBUTION
Sub-tropical and temperate rainforests	Pockets of cool temperate rainforest occur in the extreme north-east of the Western Port catchment
Evergreen sclerophyllous forests, woodlands or scrub	Forest and woodland originally occupied most of the Biosphere reserve, and remnants remain widespread
Temperate grasslands	Grasslands were locally extensive on the fringes of the former Koo Wee Rup Swamp, and are extremely rare today
Wetlands	Wetlands originally occupied large areas of the lowland section of the Biosphere reserve, particularly north of Western Port (former Koo Wee Rup Swamp), and remnants remain widespread
Mangroves	Mangroves occur along much of the coast of Western Port
Marine ecosystems	Intertidal mudflats, seagrass areas and subtidal marine areas are extensive in Western Port

In the context of the State of Victoria, the proposed Biosphere reserve includes parts of three biogeographic regions, termed bioregions by the Department of Natural Resources and Environment (NRE 1997, NRE 2001a):

BIOREGION	DISTRIBUTION
Gippsland Plain	Lowland areas, majority of Biosphere reserve
Highlands – Southern Fall	Mountains and foothills in north of Western Port catchment
Strzelecki	Hills in south-east of Western Port catchment

LANDCARE REVEGETATION PROJECT, CARDINIA SHIRE



9. LAND USE HISTORY:

➔ *If known, give a brief summary of past/historical land use(s) of the main parts of the proposed Biosphere reserve.*

Pre-European Settlement

It is difficult to provide an overview of pre-contact history, because much of the recorded information is sourced from records dating back to 1835, and these records are predominantly the impressions and recollections of European settlers and explorers. The major reference used is the report commissioned by the Land Conservation Council, *Aboriginal Occupation of the Melbourne Area, District 2* (Goulding 1988, LCC 1991). A recently released publication, *Boon Wurrung People of the Port Phillip district* (Cotter 2001), also provides an authoritative outline of the history of the people who occupied this area prior to European settlement.

Information available, which is confirmed by discussions with representatives of the traditional owners, supports the position that the Aboriginal people had a strong association, both socially and culturally, with the land they inhabited. This association between the natural world and the daily lives of Aboriginal people is often referred to as the Dreaming, or Dreamtime (LCC 1991).

The Dreaming not only refers to a history of Aboriginal society, but also represents a perspective of life and eternity, involving the past, the present, and the future in an ongoing belief system. This belief system provided Aboriginal people with guidelines for living as part of the environment they inhabited (LCC 1991).

The area was occupied predominantly by the Bunurong (also referred to as the Bunwurrung and Boon Wurrung) tribe (Gordon 1997). Within this tribe, there were a number of small clans comprising up to 20 people (Moorhead, 1971), each member of the clan "acted as curator of the resources available" within the area (LCC 1991). The Bunurong was the tribe that occupied the area around Port Phillip mainly to the south of Melbourne and including Western Port. This tribe was part of an area occupied by several tribes comprising the "Kulin Nation" (Barwick 1984). Estimates of the Aboriginal population for the "Kulin Nation" pre-European contact vary from 1500 to 12,000. The Bunurong would, therefore, be much fewer as this tribe was subjected to earlier European contact involving explorers and sealers, who often abused members of this tribe and kidnapped many, forcing their movement away from accessible coastal areas. As with other tribes where European contact occurred, the Bunurong were exposed to European diseases and therefore at the time of William Thomas' estimates in 1840 relatively few Bunurong were present in their original or traditional areas (LCC 1991). The comments of European explorers indicated a complete lack of understanding of the culture of the Aboriginal people and the manner in which they occupied the land (Cannon 1993, Presland 1994). For example, the lack of permanent settlements was interpreted as a lack of ownership. There was a failure to recognise the relationship with the land, and therefore the need to ensure its protection as part of recognising the rights of the Aboriginal people. Instead, occupation, alienation and dispossession occurred very quickly as European settlers moved in (Cannon 1993, Presland 1994).

Evidence of Aboriginal presence along the coastal areas is reflected in the numerous middens (shellfish remains buried in the sand dunes). There are also a number of sacred burial sites and scarred trees, which are now protected by Australian legislation. The Bunurong, in common with other Aboriginal tribes, were essentially hunters and gatherers, relying on their local areas for the food required. The manner in which they satisfied their food needs was broadly adapted to the ecology of each region (LCC 1991).

Clans would move around their area, rarely travelling more than 10 kilometres per day, setting up camps with makeshift shelters rather than significant accommodation structures. Thomas (1854) noted that "the Bunurong would rarely camp for more than three nights in any one place, and often stayed only one night (in warm weather, when the tribe was moving about)." Thomas wrote that the people seldom built mia-mias (huts), preferring rather to build lean-to's, with bark sheets resting against a bough. When a more substantial "village" was erected, he noted that it was arranged into small groups of about six mia-mias, five or six metres apart, with 20 metres between each group (LCC 1991).

European Settlement

The first European settlement on Port Phillip Bay (Collins settlement) occurred in 1803 in Sorrento and was established by the British Government. This lasted only until 1804, after which the main contact with Aborigines was by sealers, whalers and convicts (LCC 1991). The Sorrento site today is partly within a reserve where Aboriginal occupation of the area is recognised, together with those Europeans involved in the first settlement.

A small settlement post was also established on the eastern shores of Western Port at Corinella in 1826. This lasted until 1828, when it was abandoned. The Batman Treaty was signed in 1835 by some Aborigines in the Port Phillip district with pastoralist John Batman. This treaty effectively dispossessed the local Aborigines of their land. The treaty is not recognised by the Government, but it does provide evidence of the manner in which lands were acquired by pastoralists, and also governments, thereby forcing the Bunurong from their traditional lands and dispersing them among adjoining tribes (Cannon 1983 & 1993, LCC 1991).

European settlement of the area occurred rapidly between 1835 and 1840. By 1851, when the Colony of Victoria was officially proclaimed, only the heavily forested mountains and the dry regions of the Mallee remained unoccupied. The total European population numbered 80,000 people (LCC 1991, Cannon 1993).

Western Port was named on 5 February 1798 by George Bass. He received permission from Governor John Hunter to sail a boat along the unexplored section, south of Botany Bay. This voyage led to the discovery of Western Port, so named because of its situation relative to every other known harbour on the coast at that time (LCC 1991).

James Grant and John Murray examined the area on separate voyages from Sydney in 1801, and a French party under Nicholas Baudin visited it while sailing through Bass Strait in 1802 (LCC 1991).

A military camp was set up later at Corinella in 1826 by Earl Bathurst because of the perceived threat of French settlement. The French were very interested in this area and carried out several scientific studies of the area and were responsible for naming French Island (LCC 1991).

At Point Nepean, a quarantine station was set up and was the landing point for many European settlers.

Between 1825 and 1835, various temporary settlements were sited at Western Port. Much of the land was occupied under pastoral leases by 1842. Following the rapid growth of Melbourne in the 1850s and 1860s, fishing settlements grew up and jetties were built to enable shipment of timber and small quantities of coal. The Koo Wee Rup swamplands were drained in the late 19th century and turned to intensive agricultural use. Phillip Island became a popular holiday destination, as did Sorrento on the Mornington Peninsula. Other settlements gradually developed generally consistent with the settlement patterns that are currently evident (LCC 1991).

The Nepean Peninsula was the site of the first industry in Victoria, with the establishment of numerous lime kilns, to supply lime to Melbourne from c1839 to 1990. The area also supported fishing, and timber cutters supplied wood to fire Melbourne's bakeries from c1890 to 1920.

MANGROVES IN WESTERN PORT



10. HUMAN POPULATION OF PROPOSED BIOSPHERE RESERVE:

➡ *Approximate number of people living within the proposed Biosphere reserve.*

permanently / seasonally

10.1 CORE AREA(S):

Nil / nil

10.2 BUFFER ZONE(S):

Nil / nil

10.3 TRANSITION AREA(S):

Approximately 180,000 permanent

270,000+ seasonal

10.4 BRIEF DESCRIPTION OF LOCAL COMMUNITIES LIVING WITHIN OR NEAR THE PROPOSED BIOSPHERE RESERVE:

➡ *Indicate ethnic origin and composition, minorities, etc, their main economic activities (eg, pastoralism) and the location of their main areas of concentration, with reference to a map if necessary.*

The Biosphere reserve features a more or less continuous strip of urban settlement along the Port Phillip Bay coast of the Mornington Peninsula, extending from Frankston south and west to Point Nepean. Towards the southern part of the Port Phillip coast, from about Rosebud to Portsea, a significant proportion of the housing stock provides holiday homes for Melbourne residents. There has been a gradual conversion of part of the holiday home share of the housing stock to permanent occupation, as owners have retired and sold their principal residences closer to Melbourne.

Inland, the Peninsula is relatively densely settled farmland, with a number of small service townships such as Somerville and Red Hill. Mornington Peninsula National Park includes most of the southern coastline of the Peninsula west of Cape Schanck, while a number of small villages dot the coastline to the east. North of the naval training base HMAS Cerberus lie the more substantial townships of Crib Point, Bittern and Hastings. Hastings supports some significant industrial operations, especially those connected with port operations, although industrial development has never reached the extent that was envisaged in the 1960s, and some major operations such as the BP Crib Point oil refinery have closed in recent decades.

The north and east coasts of Western Port include a number of small townships such as Tooradin, Koo Wee Rup, Lang Lang and Grantville, providing core services to the surrounding agricultural districts. The farmland to the north of Western Port, on the deep peaty soils of the former Koo Wee Rup swampland (which was drained in the late 19th century) enjoys some of the richest soils in Victoria, and supports substantial horticultural, dairying and other intensive agricultural production.

Phillip Island is an important holiday and tourist destination, sharing with Mornington Peninsula a high proportion of holiday homes among its housing stock. It also includes many retirees among its permanent population. Attractions on the Island include beaches, surfing, the Penguin Parade, Seal Rocks Sea Life Centre and the Phillip Island Motor Racing Track, which hosts the Australian Motor Cycle Grand Prix.

French Island has maintained its isolation over the years, due in large part to its limited transport connections with the mainland. The permanent population remains under 100, with a few dozen additional part-time residents. The island is not part of any local government area, with essential and administrative services provided to the community through a variety of other channels. French Island National Park comprises over half the land area of the island.

Compared with metropolitan averages* (see below), the population of the Mornington Peninsula, which would resemble that of the rest of the proposed Biosphere reserve, is characterised by:

- A high and increasing proportion of the population aged 60 or over (21.5% compared to the Melbourne metropolitan figure of 15.3%).
- A high proportion of residents whose “home” language is English (92% compared to the Melbourne metropolitan figure of 71%).
- A high proportion of Australian-born residents (78% compared to the Melbourne metropolitan figure of 67%).
- A slightly lower average household size than for metropolitan Melbourne (2.53 persons per household compared to 2.69).
- A high proportion of unoccupied private dwellings at the time of the census: August, which is winter (35% compared to the metropolitan Melbourne figure of 8%).
- A slightly elevated proportion of low-income earners (51% of the population, aged 15 years and over, earning less than \$300 per week, compared to the metropolitan Melbourne figure of 46%).


These characteristics reflect the high use of the area for seasonal (summer) recreation and holiday-making, a relatively high proportion of retirees in the permanent population and a relative lack of high-paying employment opportunities in the immediate area. The relatively small proportion of the population with an overseas origin comes mostly from the United Kingdom, New Zealand or European countries such as the Netherlands, Italy and Germany. However, it is likely that over time the rising metropolitan representation of people with Asian and Middle Eastern backgrounds will be reflected in the population of the proposed Biosphere reserve.

* All figures used in the section are derived from the 1996 National Census. Comparable detailed figures at the time of writing had not yet been released from the most recent National Census, conducted in August 2001.

10.5 NAME OF NEAREST MAJOR TOWN

City of Melbourne, capital city of State of Victoria – see also Map 1.

10.6 CULTURAL SIGNIFICANCE

 **Briefly describe the proposed Biosphere reserve's importance in terms of cultural values (religious, historical, political, social, ethnological).**

The proposed Biosphere reserve has a diverse range of cultural values, many of which are discussed under other headings in this nomination. Brief mention is provided here of a number of significant cultural characteristics of the area.

Aboriginal use of the area would have changed significantly following the rise in sea level that flooded sunklands, creating Port Phillip Bay and Western Port 6000 to 8000 years ago. This event, the result of global sea level change, which also separated Tasmania from the Australian mainland, converted elevated areas in the sunklands to islands such as Phillip and French Islands. Evidence of Aboriginal land-use patterns and activities near the coast would have been inundated and destroyed at this time.

Extensive shell middens and other archaeological sites in the proposed Biosphere reserve, especially around the coastline, provide evidence of Aboriginal occupation up to the period of first documented contact with Europeans, about the beginning of the 19th century (Sullivan 1981, Presland 1994). French and British expeditions visited the area, and the tension between Britain and France at the time prompted the British to hastily establish a “permanent” but short-lived settlement at Sorrento, just inside the entrance of Port Phillip Bay. William Buckley, a convict who escaped from the settlement, was left behind when it was abandoned, and lived with the Aboriginal people for more than 30 years before genuinely permanent British settlement was established at the northern end of Port Phillip Bay, on the site of present-day Melbourne (LCC 1991, Gordon 1997).

The strategic significance of Western Port and Port Phillip Bay was recognised with the siting of military bases on both sides of the Port Phillip Bay entrance (known as The Rip, for its strong tidal currents), at Queenscliff to the west and Point Nepean to the east. A base was also established at West Head, at the western entrance to Western Port. Although these bases were operational during both World Wars, they saw little action, due to the isolation of south-eastern Australia from the main theatres of those conflicts.

The Mornington Peninsula was recognised relatively early in the development of Melbourne as an ideal recreational venue. Holiday homes at the southern end of the Peninsula, around Portsea and Sorrento, have historically commanded extremely high prices. Further east, along the flatter shorelines from Mount Martha to Rye, foreshore camping grounds have provided budget summer holiday venues for

many Melburnians. Traditions have been established of families returning annually to the same site for decades, even generations. The rising popularity of golf as a recreational activity, combined with the light soils and undulating topography of the Peninsula, has led to the rapid expansion of public and private golf courses on the Nepean Peninsula.

Phillip Island, although further separated from Melbourne, has also become an important holiday destination. It supports one of Victoria's premier tourist attractions, the Penguin Parade, viewed annually by many thousands of visitors, more than half of whom include the attraction as part of a visit to Australia from overseas. The attraction provides for visitors to view the nightly return of Little Penguins from their feeding waters in Western Port and Bass Strait to their burrows in the dune fields behind Summerlands Beach. Phillip Island's other natural attractions include surf beaches, Koalas and Australia Fur Seals at their colony at The Nobbies, at the western end of the Island (AHC 2002).

Western Port is something of an icon for the environmental movement in Victoria. During the 1960s, plans were being formulated for extensive industrial development around Hastings and on French Island, to take advantage of the natural deepwater access to the Port. However, as environmental awareness in the community rose, (fuelled in part by fiery debates elsewhere in the State), demands for better consideration of Western Port's natural values led to the establishment of a high-level inquiry.

The product of that inquiry, the Shapiro study (Shapiro 1975), summarised extensive scientific investigation and provides an early example of strategic environmental assessment, long before that term was in common (or indeed specialist) usage. The designation of Western Port as a Ramsar wetland of international importance reflects the high ecological value of the bay. A number of the studies instituted at the height of the debate in the early 1970s by non-government groups determined to highlight the area's ecological qualities continued long after the publication of the Shapiro Report, and are among the longest-running, continuous environmental monitoring programs in the State. These studies (Champion 1974, Shapiro 1975, Loyn 1975 & 1978) provide excellent benchmarks for measuring environmental change into the future, as well as underlining strong community attitudes about Western Port.

Established industries continue to operate on the mainland shores of Western Port near Hastings, providing significant local employment. These industries are subject to increasingly sophisticated environmental legislation and standards, to which they have responded with progressively improved environmental performance. The Biosphere reserve proposal provides an opportunity, recognised by major industrial players, for further steps towards broad-based sustainability.

PENGUIN PARADE, PHILLIP ISLAND NATURE PARK



11. PHYSICAL CHARACTERISTICS (STAGE 1 & STAGE 2)

11.1 SITE CHARACTERISTICS AND TOPOGRAPHY OF AREA

➔ *Briefly describe the major topographic features (wetlands, marshes, mountain ranges, dunes, etc) which most typically characterise the landscape of the area.*

The Mornington Peninsula and Western Port catchment have a variable topography, which is reflected in a wide range of natural and modified ecosystems.

In the north are mountain ranges and foothills, part of the Central Highlands, which in turn are part of the Great Dividing Range, which runs up the east side of Australia. In the south-east are rolling hills, part of the isolated Strzelecki Ranges. To the south and west, these higher areas change abruptly to the lowlands, which include most of the terrestrial section of the Biosphere reserve. The lowlands include an extensive plain (the former Koo Wee Rup swamplands), large areas of gently undulating terrain, and isolated hills on the Mornington Peninsula (Mount Eliza, Mount Martha, and Arthurs Seat). The coastlines comprise rocky headlands, sand dunes, marshes and swamps. Western Port is a shallow embayment that includes two large islands (French Island and Phillip Island), and a major tidal divide system around French Island at the northern end.

11.1.1 Highest elevation above sea level

300 metres (Arthurs Seat) – Stage 1

898 metres (Spion Kopje) – Stage 2

11.1.2 Lowest elevation above sea level

0 metres (coastline)

11.1.3 For coastal/marine areas, maximum depth below mean sea level

Approximately 20 metres

FRENCH ISLAND NATIONAL PARK



11.2 CLIMATE

➔ *Briefly describe the climate of the area using one of the common climate classifications.*

The proposed Biosphere reserve has a temperate climate, with altitude, landform and proximity to the coast influencing the patterns of temperature and rainfall. The climate can be described as Mediterranean, meaning a dry and warm-to-hot summer and a wet winter-spring (LCC 1991). Temperatures are generally mild and moderated by proximity to the coast, although extreme high temperatures do occur. Average annual rainfall varies considerably, from over 1400 mm in the mountainous north-east of the Western Port catchment to less than 700 mm at Point Nepean (LCC 1991). Commonwealth Bureau of Meteorology website: (<http://www.bom.gov.au/weather/vic>).

11.2.1 Average temperature of the warmest month

February: mean daily maximum 24.4 °C, mean daily minimum 14.1 °C.

11.2.2 Average temperature of the coldest month

July: mean daily maximum 13.2 °C, mean daily minimum 7.0 °C.

11.2.3 Mean annual precipitation

765 mm, recorded at an elevation of 12 metres.

11.2.4 If a meteorological station is in or near the proposed Biosphere reserve, indicate the year since when climatic data have been recorded

Three operating meteorological stations are located within the proposed Biosphere reserve, and are part of a national network run by the Commonwealth Bureau of Meteorology. These stations are Cranbourne Botanic Gardens, Mornington and Phillip Island (Cowes). There are also several close stations that provide relevant climatic data. Data for the most central station (Cowes) are presented here.

a) manually: 1882.

b) automatically: not applicable.

c) Name and location of station: Cowes, Phillip Island (source: Commonwealth Bureau of Meteorology 2002).

11.3 GEOLOGY, GEOMORPHOLOGY, SOILS

➔ *Briefly describe important formations and conditions, including bedrock geology, sediment deposits, and important soil types.*

The proposed Biosphere area is geomorphologically diverse and geologically complex. The area includes mountains, foothills, as well as coastal plains (LCC 1991).

In the Western Port catchment (which encompasses most of the Biosphere proposal, Stages 1 and 2) the numbers of sites of geological or geomorphological interest (Rosengren 1984) are as follows:

- International: 2 (The tidal watershed of Western Port, which is not crossed by incised channels and Pioneer Bay on the Bass coast which is an example of quaternary stratigraphy).
- National: 8 (Cape Woolamai tombolo; Woolamai Beach and tie-bar; Labretouche granite caves; Yallock Creek swamp sediments; Lang Lang River incision at Heath Hill; Bass River delta and plain; Lyall inlet to Bunyip River coastline; Native Dog Creek to Thorny Beach).
- State: 64 (includes examples of soil pipes, multiple spit, terraces and abandoned channels, Athlone, Mesozoic sediments and fossils, older volcanoes, arcuate ridge, raised beaches, volcanic plug, tombolo, etc).
- Regional: 124.
- Local: 24.

GEOMORPHOLOGY

The major geomorphological landforms classified under Victorian geomorphic units in the proposed Biosphere area are:

- Northern Uplands (Central Highlands).
- Southern Uplands (South Gippsland Hills and Southern Mornington Peninsula).
- Central Lowlands (Western Port and Mornington Peninsula Lowlands).

By the Jurassic period (Mesozoic era), approximately 205 to 141 million years ago, most of eastern Australia was an extensive erosion plain that was not much above sea level. Late in the Jurassic period, uplift and warping formed what are now the Victorian Central Highlands, which run east–west across the state. Depressions were also formed to the south of the highlands. Uplift and down warping continued intermittently in later periods from 65 to 5 million years ago, forming the basic topography on which the landscape features were and continue to be formed. Over time, watercourses draining the highlands formed broad plains to the south. Mature river valleys were formed in the softer rocks, with the more resistant rocks that were laid down in the much earlier Palaeozoic era remaining and forming outcrops and larger features in the landscape. As well as these more resistant rock formations (granites, lavas and sandstones) remnants of the Mesozoic era plain remained visible (Rosengren 1984, LCC 1991).

During the Eocene and Oligocene epochs (Tertiary period – 54 and 37 million years ago) there were geologically active periods with tectonic movement and volcanic eruptions. River valleys were filled with acidic volcanic lava and a lava plain was formed in the South Gippsland region (Rosengren 1984, LCC 1991).

Later, during the Oligocene and Miocene epochs (35 and 5 million years ago), the lower-lying area of the Port Phillip district was submerged by the sea. Sedimentary deposits remain as evidence of this sea ingression (Rosengren 1984, LCC 1991, OCE, 1991).

Subsequent to this, further uplifting of the highlands and warping occurred and the sea retreated to near its present coastal position. The result was further erosion and subsequent production of broad river plains. The rivers deposited sheets of gravels, clays and sands on the downstream lowlands (Rosengren 1984, LCC 1991).

Five million to 1.8 million years ago, in the late Pliocene to early Pleistocene epochs, tectonic movements further elevated the Highlands but also what are now the South Gippsland Uplands. A number of faults were formed (Rosengren 1984, LCC 1991).

Ravines, valleys and hill cappings were formed by erosion of gravels in uplifted areas. The hill cappings in the South Gippsland uplands and margins of the Eastern Highlands were formed in this manner.

Volcanic activity in central and western Victoria from five million to 10,000 years ago produced extensive basalt plains, some of which extended into the south of the proposed Biosphere region (Rosengren 1984, LCC 1991).

Melting of glacial ice at the end of Pleistocene epoch ice-age led to a rise in sea levels worldwide. A final down-warping around the southern coastal region resulted in the formation of present day Port Phillip Bay, the drowning of the Western Port region to form an embayment and the separation of Tasmania from the Australian mainland with the formation of Bass Strait. During the same era, the Central Highlands were uplifted to their present level. Although no glaciation was present in the region, it is possible that watercourses carried greater volumes of water from the highlands during this period of higher rainfalls. This may explain the large river plains of some relatively minor watercourses (LCC 1991). The coastal calcareous sand dunes, such as those found at Point Nepean, are Aeolian and were not formed under the sea (LCC 1991).

Northern Uplands

Includes mountains and foothills comprising several geomorphic units, most notably a series of stepped plateaus.

Southern Uplands

Comprise parts of the Strzelecki Ranges and Mornington Peninsula, which were formed as a result of block faulting.

Central Lowlands

The part of the central lowlands within the proposed Biosphere region includes the now-drained Koo Wee Rup swamplands, the northern and south-western Mornington Peninsula, as well as French Island and Phillip Island. This geomorphological land unit is comprised of sediments and remnants of older volcanic plains with low elevation and subdued relief. There are many faults in the lowlands unit, notably prominent faults include Selwyn fault, Tyabb fault, and Lang Lang fault. Selwyn fault, which marks the western edge of the Mornington Peninsula, is still active. These faults have influenced the local topography and formed features such as the Arthurs Seat escarpment.

Extensive quaternary dune sands are found to the north–northwest of the Mornington Peninsula in the vicinity of Frankston, Cranbourne and Langwarrin. On the Point Nepean coast, dune sands have been lithified to form limestone (LCC 1991).

The areas showing little erosion into valleys and ravines are generally located in the sunlands. This includes the Lang Lang district on the eastern side of Western Port and the Western Port islands, namely Phillip Island and French Island (LCC 1991).

GEOLOGY

The geology of the region is complex and for brevity only the major features of the geology will be discussed here.

During the Palaeozoic era (575 million years ago) most of the area lay under the sea and marine sediments were deposited. In the late Devonian (370 to 354 million years ago) these sediments were uplifted and folded along north-south axes with intrusions of granite and acidic volcanic flows (LCC 1991). These form the bedrock of the region.

From the Cambrian to early Devonian (575 to 416 million years ago) extruded submarine volcanic material was overlaid with marine sediments. These consist of interbedded sandstone, siltstone, and block shale (LCC 1991). Considerable folding of these sedimentary rocks occurred in the middle of the Devonian period. In the late Devonian period, areas of folded sediments underwent intrusions of acid igneous rocks leading to the formation of granitic landforms (LCC 1991). Larger landforms, such as granodiorites and the granites of the Baw Baw region, and smaller landforms such as Arthurs Seat, Mount Eliza and Mount Martha on the Mornington Peninsula were formed in this way (LCC 1991).

The east-west trough formed in southern Victoria prior to the Cretaceous period (141 to 65 million years ago) filled with arkose, conglomerates and mudstone (LCC 1991). Plant material accumulated in swamps and subsequently formed into the coal seams at Korumburra and Wonthaggi to the south-east of the proposed Biosphere reserve.

In the lower Cretaceous beds, fossil plant assemblages indicative of the Mesozoic era are prominent, which include liverworts, mosses, horsetails, cycads, ferns and conifers. Dinosaur remains from this age have also been found further to the east at Cape Patterson (LCC 1991).

EASTERN GREY KANGAROO *MACROPUS GIGANTEUS*



In the Tertiary Period (65 to 1.8 million years ago) the Port Phillip sunkland and Western Port Basin underwent two terrestrial phases interspersed with a marine phase due to sea level changes. Intermittent volcanic activity was also a feature of these times. Sequential flows of volcanic material (basalts) were extruded in downfaulted basins, forming much of the Mornington Peninsula. Marine sediments were covered by a widespread, thin sequence of terrestrial sand, gravel, and silt from the rivers draining the highlands. Approximately 1.8 million years ago in the early Pleistocene, movements along older fault lines, in combination with the effects of river watercourses, developed the modern drainage system and sediment deposits (LCC 1991).

Both marine (sandy limestone, shelly limestone and shell beds) and non-marine (alluvium, colluvium, calcareous sand, and dune limestone) sediments were deposited in coastal and riverine locations. These sediments form important aspects of the surface geology of the river valleys such as the Bass River; the former Koo Wee Rup swampland, the Lang Lang area, and the south-western Mornington Peninsula (LCC 1991).

SOILS

Soil types vary considerably in the region, often with radical changes in soil types within a remarkably short distance (Jenkin 1974, Calder, 1986, LCC 1991).

A broad description of soil types is given below for each of the geomorphic units previously described.

Northern Uplands

Organic loamy soils, including brown friable earths and peats, have formed in the elevated plateaus and tablelands in the northern reaches of the proposed Biosphere area.

Major soil types found in these dissected uplands of the Central Highlands, with the many incised valleys and complex networks of streams, include red and brown friable earths, hard acidic duplex soils and red clay subsoils, shallow stony soils, and yellow duplex soils (LCC 1991).

Southern Uplands

On the higher areas of the Mornington Peninsula, soil types in general are hard acidic duplex soils with yellow clay subsoils and red friable porous earths. These include yellow duplex, red friable, grey clay, yellow earth, and pale sands (LCC 1991).

Similar soils are found in the South Gippsland Highlands but also include brown friable earths. Recorded soils are yellow duplex, red and brown friable earths, and shallow stony loam (LCC 1991).

Southern Lowlands

Sands and duplex soils with yellow clay subsoils are a feature of the fans and terraces of the Western Port coastal plains and the western Gippsland region.

At Koo Wee Rup and Lang Lang, these soils are pale sands, calcareous sands, dark clays, yellow duplexes, and yellow earths (LCC 1991).

On French Island and Phillip Island, soils include pale calcareous sands, yellow and dark clay, and yellow duplex soils (LCC 1991).

On Point Nepean and lowlands of the Mornington Peninsula, sands and clays are the prominent soil types. Leached sands are common on the lower Mornington Peninsula and in the Cranbourne region (LCC 1991).

12. BIOLOGICAL CHARACTERISTICS

➔ List main habitat types (eg, tropical evergreen forest, savanna woodland, alpine tundra, coral reef, kelp beds) and land cover types (eg, residential areas, agricultural land, pastoral land). For each type circle REGIONAL if the habitat or land cover type is widely distributed within the biogeographical region within which the proposed Biosphere reserve is located to assess the habitat's or land cover type's representativeness. Circle LOCAL if the habitat is of limited distribution within the proposed Biosphere reserve to assess the habitat's or land cover type's uniqueness. For each habitat or land cover type, list characteristic species and describe important natural processes (eg, tides, sedimentation, glacial retreat, natural fire) or human impacts (eg, grazing, selective cutting, agricultural practices) affecting the system. As appropriate, refer to the vegetation or land cover map provided as supporting documentation.

A wide range of natural land cover types occurs within the proposed Biosphere reserve, and are described below. Due to extensive clearing, the majority of the terrestrial area consists of highly modified land cover types, namely residential/industrial areas and agricultural areas. These are also described below.

An estimated 22% of the proposed Biosphere reserve supports native vegetation, according to the Western Port Catchment Action Program (Port Phillip Regional CALP Board 1999). Further mapping and analysis of native vegetation appears in the Draft Port Phillip and Western Port Native Vegetation Plan (Port Phillip CALP Board 2000). Much of the vegetation is fragmented, with extensive vegetation restricted to the mountainous north-east of the catchment and to French Island. A great diversity of vegetation occurs on the Mornington Peninsula.

Classification of native vegetation in Victoria follows a typology in which ecological vegetation classes (EVCs) are the primary level of classification. Each EVC contains one or more floristic communities (Oates & Taranto 2001). Ecological vegetation classes are broad units and are referred to as ecosystems for the purposes of this nomination.

The distribution of areas covered by the eight habitat/land cover types described in the next section are shown in Map 3 of this report. The associated ecosystems are shown on a map (scale 1:100,000) accompanying this nomination to UNESCO.

12.1 FIRST TYPE OF HABITAT/LAND COVER

Forest (Regional)

Forests have more than 30% tree cover and range in height from 25 to 60 metres.

Several forest ecosystems occur within the proposed Biosphere reserve (LCC 1991, Oates & Taranto 2001) including:

ECOSYSTEM	DESCRIPTION
Cool Temperate Rainforest	Closed forest in gullies of north-eastern mountains, dominated by Myrtle Beech, understorey rich in ferns, mosses and liverworts
Damp Forest	Forest in gullies and on adjacent slopes in medium rainfall areas, dominated by several eucalypt species, with grassy understorey
Grassy Forest	Forest in foothills within the northern part of the biosphere reserve, dominated by several eucalypt species including Long-leaf Box <i>Eucalyptus goniocalyx</i> , with grassy understorey
Herb-rich Foothill Forest	Forest in foothills of north-eastern mountains and in higher rainfall parts of the lowlands, dominated by several eucalypt species especially Messmate Stringybark <i>Eucalyptus obliqua</i> , with usually grassy understorey
Lowland Forest	Forest in higher rainfall parts of the lowlands, dominated by several eucalypt species especially Messmate Stringybark <i>Eucalyptus obliqua</i> and Narrow-leaf Peppermint <i>Eucalyptus radiata</i> , with shrubby understorey
Riparian Forest	Forest on alluvial flats along major swift-flowing streams, dominated by Manna Gum <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> , with characteristic shrubs and grasses and fern-rich understorey
Shrubby Gully Forest	Forest in gullies in the northern part of the biosphere reserve, dominated by Manna Gum <i>Eucalyptus viminalis</i> ssp. <i>viminalis</i> and Swamp Gum <i>Eucalyptus ovata</i> , with shrubby understorey
Warm Temperate Rainforest	Closed forest in gullies of the Strzelecki Ranges, dominated by Blackwood <i>Acacia melanoxylon</i> , Muttonwood <i>Rapanea howittiana</i> and Sweet Pittosporum <i>Pittosporum undulatum</i> , understorey rich in ferns and vines, extremely rare today
Wet Forest	Tall forest in higher wetter parts of north-eastern mountains, dominated by Mountain Ash <i>Eucalyptus regnans</i> (tallest flowering plant on Earth), with fern-rich understorey

12.1.1 Characteristic species

PLANT SPECIES THAT ARE FREQUENT WITHIN FOREST ECOSYSTEMS INCLUDE:

<i>Eucalyptus regnans</i>	Mountain Ash (northern mountains only)
<i>Eucalyptus sieberi</i>	Silvertop Ash (northern mountains only)
<i>Eucalyptus obliqua</i>	Messmate Stringybark
<i>Eucalyptus radiata</i>	Narrow-leaf Peppermint
<i>Eucalyptus viminalis</i>	Manna Gum
<i>Acacia dealbata</i>	Silver Wattle
<i>Acacia melanoxylon</i>	Blackwood
<i>Coprosma quadrifida</i>	Prickly Currant-bush
<i>Pteridium esculentum</i>	Austral Bracken
<i>Poa labillardierei</i>	Common Tussock-grass
<i>Acaena novae-zelandiae</i>	Bidgee-widgee
<i>Epacris impressa</i>	Common Heath
<i>Gahnia radula</i>	Thatch Saw-sedge
<i>Leptospermum continentale</i>	Prickly Tea-tree
<i>Acrotriche serrulata</i>	Honey-pots
<i>Tetrarrhena juncea</i>	Forest Wire-grass
<i>Acrotriche prostrata</i>	Trailing Ground-berry
<i>Lomandra filiformis</i>	Wattle Mat-rush
<i>Cassinia aculeata</i>	Common Cassinia
<i>Billardiera scandens</i>	Common Apple-berry
<i>Drosera peltata</i>	Tall Sundew

12.1.2 Important natural processes

NATURAL PROCESS	DESCRIPTION
Drought	Major and minor droughts periodically affect these ecosystems
Flood	Major and minor floods frequently affect riparian ecosystems
Grazing by native mammals and invertebrates	Under natural conditions, grazing by macropods and invertebrates result in biomass reduction and opening of habitats for recruitment by many species
Fire	Lightning fires occasionally affect these ecosystems; fires started by Aborigines probably opened the vegetation structure of most forest ecosystems and maintained biodiversity

12.1.3 Main human impacts

HUMAN IMPACT	DESCRIPTION
Clearing for agriculture Timber production	Extensive areas have been cleared for agriculture Forests in the north-eastern mountains are used for timber production, Mountain Ash being the most valuable species
Inappropriate fire regime	Some forests are closing over with woody trees and shrubs, with resulting reduction in biodiversity, due to lack of fire; this may lead to fuel accumulation and catastrophic wildfire
Dieback	Many forest trees and other plant species are susceptible to the introduced Cinnamon Fungus <i>Phytophthora cinnamomi</i>
Weed invasion	Weed invasion is widespread, especially in riparian systems

12.1.4 Relevant management practices

MANAGEMENT PRACTICE	DESCRIPTION
Nature conservation	Some areas are reserved for nature conservation, notably in the north-eastern mountains
Water production	Some areas are managed for water production, such as the Tarago Reservoir catchment in the north-eastern mountains

12.2 SECOND TYPE OF HABITAT/LAND COVER

Woodland / heathland (Regional)

Woodlands have generally less than 30% tree cover and are 10 to 25 metres high. Heathlands are shrub-dominated and 0.5 to 2 metres high.

Several woodland/heathland ecosystems occur in the proposed Biosphere reserve (LCC 1991, Oates & Taranto 2001, J. Yugovic Biosis Research pers. comm.) including:

ECOSYSTEM	DESCRIPTION
Creekline Herb-rich Woodland	Woodland along creeklines in lowlands subject to occasional flooding, dominated by Swamp Gum <i>Eucalyptus ovata</i> and Manna Gum <i>Eucalyptus viminalis</i> ssp. <i>pryoriana</i> , with grassy understorey including semi-aquatic species.
Damp Heathland	Shrubland on infertile, seasonally wet terrain, dominated by Prickly Tea-tree <i>Leptospermum continentale</i> and Scrub Sheoak <i>Allocasuarina paludosa</i>
Damp Heathy Woodland	Woodland on infertile, poorly drained terrain, dominated by Silver-leaf Stringybark <i>Eucalyptus cephalocarpa</i> , with shrubby (heathy) understorey
Damp Sands Herb-rich Woodland	Woodland on sandy terrain in higher rainfall areas, usually dominated by Messmate Stringybark <i>Eucalyptus obliqua</i>
Grassy Woodland	Woodland on plains, undulating terrain and hills in the lowlands, dominated by several eucalypt species, especially Manna Gum <i>Eucalyptus viminalis</i> ssp. <i>pryoriana</i> , Swamp Gum <i>Eucalyptus ovata</i> and Snow Gum <i>Eucalyptus pauciflora</i> , with grassy understorey in which orchids and lilies are prominent; in terms of plant diversity, one of the most species-rich ecosystems in temperate Australia and other temperate parts of the Earth (Lunt 1990); originally widespread and extensive but now endangered
Gully Woodland	Woodland in gullies and sheltered slopes of foothills and lowlands, dominated by Manna Gum <i>Eucalyptus viminalis</i> ssp. <i>pryoriana</i> and Swamp Gum <i>Eucalyptus ovata</i> , with grassy and occasionally fern-rich understorey, including tree ferns
Heathy Woodland	Woodland on infertile terrain, dominated by Manna Gum <i>Eucalyptus viminalis</i> ssp. <i>pryoriana</i> and Narrow-leaf Peppermint <i>Eucalyptus radiata</i> , with shrubby (heathy) understorey
Plains Grassy Woodland	Woodland on lowland plains dominated by River Red Gum <i>Eucalyptus camaldulensis</i> over grassy understorey
Sand Heathland	Shrubland on well-drained infertile sand, dominated by Heath Tea-tree <i>Leptospermum myrsinoides</i>
Sandy Stream Woodland	Woodland on moist sands and gravels, dominated by Swamp Gum <i>Eucalyptus ovata</i> , with characteristic reeds, sedges, shrubs and aquatic herbs, extremely rare
Wet Heathland	Shrubland on infertile, poorly drained terrain, dominated by Scented Paperbark <i>Melaleuca squarrosa</i> and Prickly Tea-tree <i>Leptospermum continentale</i>

12.2.1 Characteristic species

PLANT SPECIES THAT ARE FREQUENT WITHIN WOODLAND AND HEATHLAND ECOSYSTEMS INCLUDE:

<i>Eucalyptus viminalis</i>	Manna Gum
<i>Eucalyptus ovata</i>	Swamp Gum
<i>Eucalyptus radiata</i>	Narrow-leaf Peppermint
<i>Eucalyptus pauciflora</i>	Snow Gum
<i>Allocasuarina littoralis</i>	Black Sheoak
<i>Banksia marginata</i>	Silver Banksia
<i>Leptospermum myrsinoides</i>	Heath Tea-tree
<i>Aotus ericoides</i>	Common Aotus
<i>Leptospermum continentale</i>	Prickly Tea-tree
<i>Themeda triandra</i>	Kangaroo Grass
<i>Austrodanthonia setacea</i>	Bristly Wallaby-grass
<i>Gahnia radula</i>	Thatch Saw-sedge
<i>Arthropodium strictum</i>	Chocolate Lily
<i>Epacris impressa</i>	Common Heath
<i>Monotoca scoparia</i>	Prickly Broom-heath
<i>Gonocarpus tetragynus</i>	Common Raspwort

12.2.2 Important natural processes

NATURAL PROCESS	DESCRIPTION
Drought	Major and minor droughts periodically affect these ecosystems
Grazing by native mammals and invertebrates	Under natural conditions, grazing by macropods and invertebrates result in biomass reduction and opening of habitats for recruitment by many species
Fire	Fires started by Aborigines probably opened the vegetation structure of these ecosystems and maintained biodiversity

12.2.3 Main human impacts

HUMAN IMPACT	DESCRIPTION
Clearing for agriculture	Extensive areas have been cleared for agriculture
Clearing for residential development	Large areas have been cleared for residential development
Extractive industries	Sand extraction has affected many of the isolates of native vegetation in lowland parts of the biosphere reserve
Grazing by domestic stock	Grazing by domestic stock affects much of the remnant woodland vegetation, with adverse, long-lasting effects
Inappropriate fire regime	Many woodlands are closing over with woody trees and shrubs with resulting reduction in biodiversity, due to lack of fire
Dieback	Many woodland trees and other plant species are susceptible to the introduced Cinnamon Fungus <i>Phytophthora cinnamomi</i>
Weed invasion	Weed invasion is widespread
Fragmentation	Most of the woodland is fragmented, resulting in local extinction and ongoing reduction in biodiversity within individual remnants as immigration rates are low to zero for many species

12.2.4 Relevant management practices

MANAGEMENT PRACTICE	DESCRIPTION
Nature conservation	Some areas are managed for nature conservation, notably French Island National Park; some ecosystems are still degrading

12.3 THIRD TYPE OF HABITAT/LAND COVER

Wetland / Swamp (Regional)

Swamps and other wetlands are herblands, grasslands, scrubs and woodlands that occur in permanent areas subject to occasional-to-frequent flooding.

Several wetland ecosystems occur in the proposed Biosphere reserve (LCC 1991, Oates & Taranto 2001, J. Yugovic Biosis Research pers. comm.) including:

ECOSYSTEM	DESCRIPTION
Aquatic Herbland	Submergent and emergent herbland in swamps that hold water for most of the year, dominated by a range of aquatic species, especially Water Ribbons <i>Triglochin procerum</i>
Plains Grassland	Grassland on flood prone sites, dominated by Tussock-grass <i>Poa labillardierei</i> , once locally extensive on the fringes of the former Koo Wee Rup Swamp, extremely rare today
Plains Grassy Wetland	Grassy wetland in swamps that are frequently dry, often dominated by Swamp Wallaby-grass <i>Amphibromus nervosus</i>
Reed Swamp	Tall grassland in swamps, especially near river mouths, dominated by Common Reed <i>Phragmites australis</i>
Riparian Scrub	Scrub along minor drainage lines within infertile terrain, usually dominated by Scented Paperbark <i>Melaleuca squarrosa</i>
Sedge Wetland	Sedgeland in swamps that are frequently dry, dominated by Pithy Sword-sedge <i>Lepidosperma longitudinale</i>
Swamp Scrub	Scrub on parts of floodplains subject to frequent flooding, dominated by Swamp Paperbark <i>Melaleuca ericifolia</i>
Swampy Riparian Woodland	Woodland beside streams subject to flooding, dominated by Swamp Gum <i>Eucalyptus ovata</i> , with shrubby understorey in which Swamp Paperbark <i>Melaleuca ericifolia</i> is prominent
Swampy Woodland	Woodland on floodplains subject to infrequent flooding, dominated by Swamp Gum <i>Eucalyptus ovata</i> , with grassy understorey

12.3.1 Characteristic species

PLANT SPECIES THAT ARE FREQUENT WITHIN WETLAND/SWAMP ECOSYSTEMS INCLUDE:

<i>Melaleuca ericifolia</i>	Swamp Paperbark
<i>Melaleuca squarrosa</i>	Scented Paperbark
<i>Eucalyptus ovata</i>	Swamp Gum
<i>Phragmites australis</i>	Common Reed
<i>Typha domingensis</i>	Cumbungi
<i>Triglochin procerum</i>	Common Water-ribbons
<i>Leptospermum continentale</i>	Prickly Tea-tree
<i>Poa labillardierei</i>	Common Tussock-grass
<i>Amphibromus nervosus</i>	Common Swamp Wallaby-grass

12.3.2 Important natural processes

NATURAL PROCESS	DESCRIPTION
Flood	Major and minor floods frequently affect these ecosystems
Drought	Major and minor droughts periodically affect these ecosystems

12.3.3 Main human impacts

HUMAN IMPACT	DESCRIPTION
Clearing for agriculture	Extensive areas have been cleared (and drained) for agriculture, notably the former extensive Koo Wee Rup swamp, once the largest swamp in south-east Australia
Alteration of drainage	Drainage alterations affect most remaining wetlands, usually resulting in reduced water input and output
Grazing by domestic stock	Grazing by domestic stock affects much of the remnant wetland vegetation, with adverse, long-lasting effects
Weed invasion	Weed invasion is widespread

12.3.4 Relevant management practices

MANAGEMENT PRACTICE	DESCRIPTION
Nature conservation	A few small areas are reserved for nature conservation

12.4 FOURTH TYPE OF HABITAT/LAND COVER

Dry coastal ecosystems (Regional)

Dry coastal ecosystems are salt-tolerant coastal grasslands, shrublands, scrubs and woodlands in areas that do not receive tidal or freshwater flooding.

Several dry coastal ecosystems occur in the proposed biosphere reserve (LCC 1991, Oates & Taranto 2001, J. Yugovic Biosis Research pers. comm.) including:

ECOSYSTEM	DESCRIPTION
Berm Grassy Shrubland	Shrubland on beaches, dominated by Coast Saltbush <i>Atriplex cinerea</i>
Bird Colony Succulent Herbland	Succulent herbland dominated by Bower Spinach <i>Tetragonia implexicoma</i> and Seaberry Saltbush <i>Rhagodia candolleana</i> , restricted to seabird breeding colonies
Calcareous Swale Grassland	Grassland in swales within Coastal Alkaline Scrub, dominated by several species, especially Kangaroo Grass <i>Themeda triandra</i> and Bare Twig-sedge <i>Baumea juncea</i> , rare or possibly extinct
Coast Banksia Woodland	Woodland usually on deep sand, often at the foot of coastal bluffs, dominated by Coast Banksia <i>Banksia integrifolia</i>
Coastal Alkaline Scrub	Scrub or woodland on deep sand dunefields, dominated by Moonah <i>Melaleuca lanceolata</i> , Drooping Sheoak <i>Allocasuarina verticillata</i> or Coast Tea-tree <i>Leptospermum laevigatum</i>
Coastal Dune Grassland	Grassland on beach dunes, dominated by Hairy Spinifex <i>Spinifex sericeus</i>
Coastal Dune Scrub	Scrub on coastal dunes, dominated by Coast Tea-tree <i>Leptospermum laevigatum</i> or Drooping Sheoak <i>Allocasuarina verticillata</i>
Coastal Headland Scrub	Scrub on coastal bluffs and cliffs, dominated by Coast Tea-tree <i>Leptospermum laevigatum</i> or Coast Beard-heath <i>Leucopogon parviflorus</i>
Coastal Tussock Grassland	Grassland on windswept coastal bluffs or adjacent to salt marshes, dominated by Coast Tussock Grass <i>Poa poiformis</i>
Spray-zone Coastal Shrubland	Low shrubland on windswept coastal bluffs or cliffs subject to salt spray, dominated by Cushion Bush <i>Leucophyta brownii</i>

12.4.1 Characteristic species

Plant species that are frequent within dry coastal ecosystems include:

<i>Atriplex cinerea</i>	Coast Saltbush
<i>Banksia integrifolia</i>	Coast Banksia
<i>Leptospermum laevigatum</i>	Coast Tea-tree
<i>Allocasuarina verticillata</i>	Drooping Sheoak
<i>Acacia longifolia</i>	Coast Wattle
<i>Tetragonia implexicoma</i>	Bower Spinach
<i>Rhagodia candolleana</i>	Seaberry Saltbush
<i>Correa alba</i>	White Correa
<i>Poa poiformis</i>	Coast Tussock-grass
<i>Austrostipa stipoides</i>	Prickly Spear-grass
<i>Spinifex sericeus</i>	Hairy Spinifex
<i>Leucopogon parviflorus</i>	Coast Beard-heath
<i>Clematis microphylla</i>	Small-leaved Clematis
<i>Dianella brevicaulis</i>	Small-flower Flax-lily
<i>Alyxia buxifolia</i>	Sea Box
<i>Lepidosperma concavum</i>	Sandhill Sword-sedge
<i>Pomaderris paniculosa</i>	Scurfy Pomaderris
<i>Melaleuca lanceolata</i>	Moonah

12.4.2 Important natural processes

NATURAL PROCESS	DESCRIPTION
Salt spray	Deposition of salt is a major natural process; salt is toxic at high levels but low levels stimulates growth in some species
Erosion and deposition of sand	Natural erosion results in the many bluffs and cliffs along the coasts; sand is naturally eroded, transported and deposited, these processes continually create and remove habitats

12.4.3 Main human impacts

HUMAN IMPACT	DESCRIPTION
Clearing for residential development	Extensive areas have been cleared for residential areas
Clearing for recreation (carparks etc.)	Substantial areas have been cleared for recreational infrastructure
Human accelerated erosion	Erosion has been accelerated by human induced loss of vegetation cover and inappropriate drainage works
Visitor pressure	Trampling of vegetation and disturbance of wildlife by people and their dogs and horses are important issues
Weed invasion	Weed invasion is widespread in dry coastal ecosystems

12.4.4 Relevant management practices

MANAGEMENT PRACTICE	DESCRIPTION
Nature conservation	Substantial areas are reserved for nature conservation, notably Mornington Peninsula National Park
Recreation management	Considerable attention is given to minimising and managing visitor impacts on natural environments

12.5 FIFTH TYPE OF HABITAT/LAND COVER

Wet coastal ecosystems (Regional)

Wet coastal ecosystems are salt-tolerant coastal herblands, grasslands, sedgeland, shrublands and scrubs in areas that receive tidal or freshwater flooding.

Several wet coastal ecosystems occur in the proposed Biosphere reserve (LCC 1991, Oates & Taranto 2001) including:

ECOSYSTEM	DESCRIPTION
Brackish Wetland	Sedgeland or grassland in estuaries subject to wide salinity fluctuations, dominated by several species, especially Sea Rush <i>Juncus kraussii</i> and Common Reed <i>Phragmites australis</i>
Coastal Salt Marsh	Herbland, grassland or shrubland in tidal areas or on bluffs or cliffs receiving salt spray, dominated by several species, especially Beaded Samphire <i>Sarcocornia quinqueflora</i> and Shrubby Samphire <i>Sclerostegia arbuscula</i>
Estuarine Flats Grassland	Grassland on elevated sites within estuaries, dominated by Prickly Spear-grass <i>Austrostipa stipoides</i> and Blue Tussock-grass <i>Poa poiformis</i>
Estuarine Swamp Scrub	Scrub on margins of salt marshes and estuaries, influenced by salinity, dominated by Swamp Paperbark <i>Melaleuca ericifolia</i>
Mangrove Shrubland	Shrubland or scrub in tidal areas of Westernport Bay, dominated by White Mangrove <i>Avicennia marina</i>

12.5.1 Characteristic species

Plant species that are frequent within wet coastal ecosystems include:

<i>Avicennia marina</i>	White Mangrove
<i>Sclerostegia arbuscula</i>	Shrubby Glasswort
<i>Suaeda australis</i>	Austral Seablite
<i>Sarcocornia quinqueflora</i>	Beaded Glasswort
<i>Samolus repens</i>	Creeping Brookweed
<i>Triglochin striatum</i>	Streaked Arrowgrass
<i>Hemichroa pentandra</i>	Trailing Hemichroa
<i>Selliera radicans</i>	Shiny Swamp-mat
<i>Disphyma crassifolium</i>	Rounded Noon-flower
<i>Gahnia filum</i>	Chaffy Saw-sedge
<i>Juncus kraussii</i>	Sea Rush
<i>Phragmites australis</i>	Common Reed
<i>Melaleuca ericifolia</i>	Swamp Paperbark

12.5.2 Important natural processes

NATURAL PROCESS	DESCRIPTION
Tidal inundation	Depth and duration of tidal inundation determines salinity and water regimes and influences many ecological processes
Freshwater flow (estuaries only)	Depth and duration of freshwater flooding interacting with tidal flows determine salinity and water regimes in estuaries

12.5.3 Main human impacts

HUMAN IMPACT	DESCRIPTION
Alteration of hydrology (drains, embankments)	Many salt marshes and estuaries have been eliminated or modified by drains and embankments
Clearing for agriculture	Some salt marshes and estuaries have been drained and cleared for agriculture
Grazing by domestic stock	Grazing by domestic stock has adverse, long-lasting effects on salt marshes and estuaries

12.5.4 Relevant management practices

MANAGEMENT PRACTICE	DESCRIPTION
Nature conservation	Much of the salt marsh vegetation is reserved for nature conservation, however estuaries are poorly reserved

12.6 SIXTH TYPE OF HABITAT/LAND COVER

Marine ecosystems (Regional)

All of the marine habitats/ecosystem types in Victoria occur in the proposed Biosphere reserve. Tide regime, substrate type and wave energy are major factors in determining species composition (LCC 1993).

HABITAT / ECOSYSTEM	DESCRIPTION
Intertidal rocky shores	Widespread along southern coasts within biosphere reserve, known for its mollusc and other fauna and for its zonation
Subtidal reefs	Rocky reefs are located at the two entrances to the bay
Seagrass beds	Widespread major fish nursery grounds, seagrass cover in Western Port collapsed by 70% in the 1970s and 1980s for unclear reasons and is gradually recovering, this is still a major ecological issue (EPA 1997)
Sheltered intertidal flats	Widespread in Western Port, too unstable for seagrass, known for waders, crabs, molluscs and fish
Mangroves	Widespread, with major occurrences in the sheltered northern half of Western Port, characteristic invertebrate fauna
Sandy beaches	Widespread along southern coasts within Biosphere reserve, known for its mollusc and other invertebrate fauna, thought to be important breeding grounds for squid
Subtidal soft substrates	Small areas of coarse shelly sand are present, with species composition determined by current flow; muddy substrates occur in the sheltered northern channels of Western Port; habitat known for its fish, mollusc and other invertebrate fauna
Pelagic environments	Pelagic environments occur in the water column, they support fish, squid and many other species including Little Penguin, Australian Fur Seal and two dolphin species

12.6.1 Characteristic species

Species that are frequent within marine ecosystems include:

Vascular plants: (shallow areas)	Dwarf Grass-wrack <i>Zostera muelleri</i> Tasman Grass-wrack <i>Heterozostera tasmanica</i> Sea Nymph <i>Amphibolis antarctica</i>
Algae:	many species
Commercial fish species:	Whiting, King George <i>Sillaginodes punctata</i> Garfish <i>Hyporhamphus melanochir</i> Flathead, Rock <i>Leviprora laevigatus</i> Shark, Gummy <i>Mustelus antarcticus</i> Calamari, Southern <i>Sepioteuthis australis</i> Elephant Fish <i>Callorhynchus milii</i> Mullet, Yellow-eye <i>Aldrichetta forsteri</i> Pike, Long finned <i>Dinolestes lewini</i> Flounder <i>Ammotretis rostratus</i> Greenback flounder <i>Rhombosolea tapirina</i> Australian Salmon <i>Arripis trutta</i>

12.6.2 Important natural processes

NATURAL PROCESS	DESCRIPTION
Tide regime	Tides fundamentally affect most of the marine ecosystems
Current regime	Currents are important in determining species composition
Nutrient inputs and outputs	Streams and the open sea input nutrients to Western Port

12.6.3 Main human impacts (based on Gunthorpe and Hamer 1998)

HUMAN IMPACT	DESCRIPTION
Sedimentation	High sediment loads and sedimentation infill estuaries, kill seagrass beds and inhibit recolonisation by seagrasses
Turbidity	Turbidity is high in places, its cause being poorly understood, and is major threat to seagrass beds
Physical disturbances	Dredging, shipping and especially boating disturb seagrass habitats and damage reefs
Low dissolved oxygen	Low dissolved oxygen occurs periodically in the Corinella region, it is poorly understood and the role of humans is unclear
Exotic species	<i>Spartina</i> grass, dinoflagellate algae and other organisms have been introduced on shipping, and have the potential to change species composition, displace native species and alter food chains and hence the availability of food
Toxicants	Pollution takes many forms, including hydrocarbons from boating activity and discharges; tributyltin levels are still high near marinas despite banning for a decade and have been implicated in seagrass loss. No major oil spills have taken place in Western Port, despite the presence of oil storage facilities
Elevated nutrients	Increased nutrients may adversely affect seagrasses by promoting epiphytic and drift algae growth
Fishing	Combined catches of commercial and recreational fishing are considerable, but the decline in seagrass in the 1970s and 1980s has been paralleled by a significant decline in fisheries, especially species associated with seagrass beds

12.6.4 Relevant management practices

MANAGEMENT PRACTICE	DESCRIPTION
Water quality control	Water quality is subject to government controls summarised in <i>State Environment Policy (Waters of Victoria) Schedule F8 (Waters of Western Port and Catchment)</i> (EPA 2001)
Fishing	Fishing is subject to a range of government controls, including catch and size limits, and temporary closure of breeding grounds
Dredging	Dredging is subject to government controls
Nature conservation	Three marine national parks and six special management areas are proposed for Western Port (ECC 2000), but have not yet eventuated

12.7 SEVENTH TYPE OF HABITAT/LAND COVER

Residential / industrial areas (Regional)

Densely populated residential areas and localised industrial areas occur on the Mornington Peninsula, Phillip Island and elsewhere. These are highly modified environments, although they support small scattered remnants of native vegetation.

12.7.1 Characteristic species

A wide range of introduced species, with a few persistent indigenous species, occupy these areas. Much of the vegetation is planted, and is water- and nutrient-demanding.

12.7.2 Important natural processes

Natural processes within isolated remnants of native vegetation are generally similar to those listed under natural land cover types, although they are often disrupted.

12.7.3 Main human impacts

Impacts within isolated remnants of native vegetation are generally similar to those listed under natural land cover types, and are most severe in smaller remnants.

12.7.4 Relevant management practices

Some isolates are managed for conservation, often by community groups, who play a significant role in their protection. Many are neglected at present.

12.8 EIGHTH TYPE OF HABITAT/LAND COVER

Agricultural areas (Regional)

Agricultural areas occur extensively over the proposed Biosphere reserve, except for the mountainous north-east of the Western Port catchment. These are highly modified environments, although they support scattered remnants of native vegetation.

12.8.1 Characteristic species

A wide range of introduced species, with a few persistent indigenous species, occupy these areas. Remaining eucalypt trees are generally not regenerating.

12.8.2 Important natural processes

Natural processes within isolated remnants of native vegetation are generally similar to those listed under natural land cover types, although they are often disrupted.

12.8.3 Main human impacts

Impacts within isolated remnants of native vegetation are generally similar to those listed under natural land cover types, and are most severe in smaller remnants.

12.8.4 Relevant management practices

Some isolates are managed for conservation, while many are neglected at present.

GREENS BUSH, MORNINGTON PENINSULA NATIONAL PARK



13. CONSERVATION FUNCTION

13.1 CONTRIBUTION TO THE CONSERVATION OF LANDSCAPE AND ECOSYSTEM BIODIVERSITY

➔ *Describe and give location of landscapes, ecosystems, habitats and/or land cover types of particular significance for the conservation of biological diversity.*

All native vegetation within the proposed Biosphere reserve is significant for conservation of biological systems. Forests in the mountainous north-east of the catchment are extensive and relatively intact, although affected by timber harvesting and past fires. Forests, woodlands and wetlands in the lowlands are all reduced to remnant status. Many of these remnants are under threat from development or degradation (Port Phillip CALP Board 2000).

Western Port provides many ecological niches required for biological diversity. There are extensive areas of shallow waters as well as deep natural channels. The shape of the bay is considered to be unusual, resulting in a complex movement of sea water within the relatively sheltered bay environment. Together with the presence of the silt-entrapping mangroves, and in some areas the inflow of fresh water from catchment streams, a complex array of habitats has been formed. "Western Port's extensive and diverse environs range from marine, to coastal to forest habitats. These features, with the numerous water bodies (including swamp areas – for example, Rhyll Swamp on Phillip Island) create their own micro-environs, and together provide, through various inter-dependencies, the essential bird-life habitats and supports for the food chain" (Shapiro 1975, AHC 2002).

There are 236 kilometres of coastline in Western Port, with 270 square kilometres of intertidal mudflats on which seagrass communities are established. Forty per cent of the coastline of the bay is also encircled by thickets of White Mangrove *Avicennia marina* and salt marshes which, together with the seagrasses, provide an important and rich base to the food chain of the bay. Mangrove and salt marshes are known to support a rich and biologically diverse community in tropical regions, and the community of mangroves in Western Port does like-wise (Shapiro 1975, AHC 2002).

The mangroves of Western Port are of significance in that they are one of only two such communities growing so far from the equator. The other community is further to the south-east on the Victorian coast at Corner Inlet (NRE 1999, AHC 2002).

The Western Port saltmarshes are known to be particularly floristically rich and relatively undisturbed, exhibiting greater floristic diversity than most other saltmarshes on the Australian southern coast. They are also extensive, extending a kilometre or more from the shoreline in many places and support a wide range of fauna in large numbers. Rather than zooplankton, detritus from these saltmarsh plant communities is believed to provide the basis of the food chain in Western Port (Shapiro 1975, AHC 2002).

Unlike the other large embayments on the southern Australian coast, Western Port has for the most part escaped large-scale urban and industrial development. In the past, mangrove flats and salt marshes were usually deemed waste lands suitable for reclamation for urban uses, and in particular, industrial development.

The bay itself covers an area of 686 square kilometres, and has extensive areas of shallow waters as well as natural deep-water channels. Marine environments in general are known to be of high genetic diversity, particularly embayments that offer protection from tidal forces (Commonwealth 1993). Almost every major division of life has at least some representation in the sea, and many divisions are principally or wholly marine. In contrast, only one-third of these large categories occur on land. Thus, the seas host nearly the entire extant diversity of basic animal body plans, while land and freshwater animals comprise myriad variations on relatively few themes. Genetic diversity too tends to be higher in marine organisms (Commonwealth 1993).

The invertebrate fauna are an important component of marine and coastal fauna food chains. The bay is, therefore, understandably an important nursery area for many faunal groups, including fish (Gunthorpe & Hamer 1998, AHC 2002).

The genetic diversity within species can also be quite remarkable, with apparent evolutionary specialisation of different members of some species to specific micro environments. Of particular scientific interest is the adaptive radiation of species of the invertebrate amphipod family *Phoxocephalidae* to occupy many different marine niches in the bay (LCC 1993, NRE 1999).

Despite the intensity of research, many taxa have yet to be studied and there is little understanding of Western Port at the ecosystem level (LCC 1993). However, of the taxa and sites investigated, a remarkable picture of biological diversity can be deduced.

The wetlands support a wide array of fauna, and particularly noticeable are the birds. For example, 37 species of waders have been recorded to frequent the area. A total of 259 bird species has been reported in Western Port, representing 65% of the 437 known species of birds in Victoria (Shapiro 1975, AHC 2002). In terms of both total numbers and in density of site occupation, Western Port is one of the three most important sites for migratory waders in this state. Ten other species of birds are seen there in higher numbers than possibly anywhere else. Many bird species may be viewed in Western Port in the thousands, and some species, such as the Short-tailed Shearwaters *Puffinus tenuirostris*, may be present in population sizes of more than a million birds (LCC 1993, NRE 1999).

Terrestrial environments within the Western Port catchment

By the early 20th century, much of the terrestrial land in the Western Port catchment was cleared for agriculture or modified by human activities such as wood collection or swamp drainage. The extensive Koo Wee Rup swamplands to the immediate north of the bay were drained and cleared for farmland. Much of the Mornington Peninsula, Phillip Island, and parts of French Island also were cleared for agriculture. Most of Melbourne's urban and industrial development, however, was concentrated around Port Phillip Bay, and the Western Port region remained largely rural (LCC 1991).

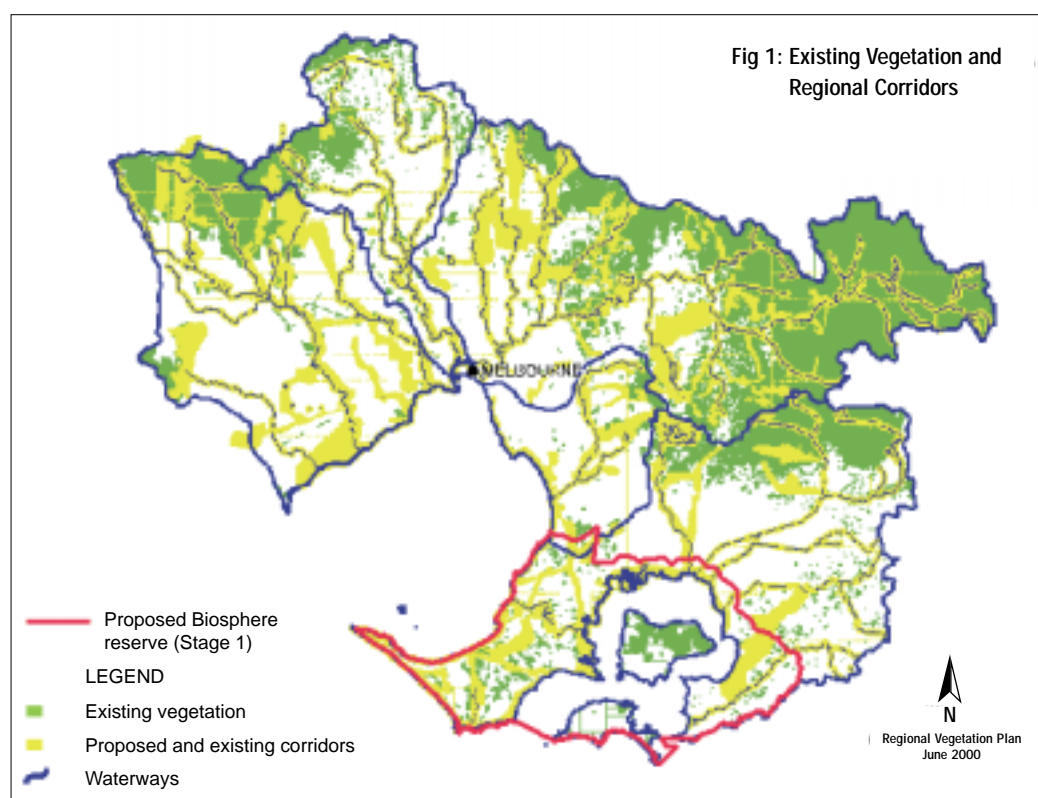
Despite the extensive clearing for agriculture, there are still many remaining remnants of near natural vegetation and larger tracts of secondary regrowth that are considered to be of conservation value (Opie et al 1984, Calder 1986). Most of the larger tracts of land are contained within the national or state parks of the region and are discussed in detail elsewhere in this application.

Existing remnants only represent a small percentage of the original vegetation cover. There is still a wide variety of habitat and plant communities represented, although much of the remaining native vegetation has been modified in some form by human activity within the past 150 years (Opie et al 1984, Port Phillip CALP Board 2000).

The Mornington Peninsula and islands of Western Port are noted for the variety and changes in habitat over short distances. The Mornington Peninsula is approximately 50 kilometres long, with an average width of about 16 kilometres from bay to bay, rising to a central ridge approx 300 metres above sea level. A complex of geological formations has led to the creation of a variety of land-forms, coastal strips, escarpments, ridges, and valleys, and a complex mosaic of soil types of radically varying pH, draining ability and salt exposure (Calder 1986).

Over geological time, as soils developed and climatic changes ensued, successive plant communities developed, displaced or mingled with earlier vegetation types. As the whole of the Australian continent became drier over geologic time, the more moisture-loving plants were replaced by others better adapted to the changing conditions (Calder 1986).

Remnants of earlier vegetation communities, however, were able to survive in the more sheltered gullies. The mosaic of soil types, climatic conditions and evolution of plant communities over many millennia had created a Peninsula of significant botanical diversity. In its pristine state, the Peninsula was thought to be "densely covered with woodlands, forests, localised swampy areas, and some restricted heathlands and grasslands" (Calder 1986). Similar vegetation communities were represented on the Western Port islands. Figure 1, below, illustrates the existing vegetation and regional vegetation corridors and the potential networks for species mobility and revegetation within the proposed Biosphere area.



Although only remnants of these vegetation communities are now in existence, some sizeable tracts of what appears to be near-natural vegetation remain on French Island, on the Mornington Peninsula, Quail Island and segments inland of the Bass coast. Many of the larger of these have been incorporated into the parks system. In addition to this, there are smaller remnants of vegetation of value elsewhere. Linear strips occur on coastal dunes, and along streams, and may also be found on roadsides. Other irregular small remnants may also be found on privately owned landholdings. Frequently, they may be all that remains of plant groupings that once covered much greater areas, or contain plants that are now uncommon or rare. These remnants provide habitat and interconnecting corridors for numerous species of native animals (WPCC 1980, Calder 1986, Port Phillip CALP Board 2000). Many of these sites may be individually considered to be of insufficient size for long-term survival. However, collectively they provide an important ecological function as wildlife corridors and seed banks of some genetic diversity (Calder 1986, Port Phillip CALP Board 2000).

French Island is one of the few habitats of the Long-nosed Potoroo *Potorous tridactylus* (WPCC 1980), and Platypus *Ornithorhynchus anatinus* may still be found along the Bass River (WPCC 1980, AHC 2002). Although echidnas *Tachyglossus aculeatus* are found in many other places within the State, there appears to be a high population density on Quail Island (WPCC 1980).

In recognition of the special ecological significance of the Western Port region, successive State and local governments have funded studies, legislated for the protection of the area, and have purchased or approved of the establishment of conservation parks in the region. International agreements have also been formed between nations at either end of bird migratory routes (NRE 1999, Port Phillip CALP Board 2000).

Clearly, the Biosphere area encompasses an area of national and international significance for the conservation of natural values and landscapes.

13.2 CONSERVATION OF SPECIES BIODIVERSITY

➔ **Identify main species (with scientific names) or groups of species of particular interest for the conservation of biological diversity, in particular if they are rare or threatened with extinction; use additional sheets if need be.**

A large number of flora and fauna species that are rare or threatened, are recorded from the proposed Biosphere reserve (Port Phillip CALP Board 2000, NRE 2000) (Appendices 1, 2). A brief overview of significant, rare or threatened species is given below:

- The rare Orange-bellied Parrot *Neophema chrysogaster* has been recorded at Barrallier Island in Western Port (NRE 1999).
- The Southern Emu Wren *Stipiturus malachurus* (threatened) and rare elsewhere, is locally common at one Western Port site (NRE 1999).
- The Swamp skink *Egernia coventryi*, an uncommon reptile, has restricted habitat preferences but has been found at high density at a number of sites within the Western Port region (NRE 1999).
- The mangrove and saltmarsh communities are one of the few sites in the state where the New Holland Mouse *Pseudomys novaehollandiae* has been recorded (NRE 1999).
- The poorly studied Australasian Bittern *Botaurus poiciloptilus*, Magpie Goose *Anseranas semipalmata*, Baillon's Crake *Porzana pusilla*, Painted Snipe *Rostratula benghalensis* are all known to frequent Western Port (NRE 1999).
- The Cape Barren Goose *Cereopsis novaehollandiae* breeds within the region, and Freckled Duck *Stictonetta naevosa* have also been sighted (NRE 1999).

A total 23 flora species recorded from the proposed Biosphere reserve are rare or threatened in Australia (NRE Flora Information System). These include four species that are endangered at the national level, as follows:

Fringed Spider-orchid *Caladenia thysanochila* is an orchid known only from Mount Eliza on the Mornington Peninsula. Matted Flax-lily *Dianella amoena* is a lily that occurs in remnants of grassland and grassy woodland. Purple Eyebright *Euphrasia collina ssp. muelleri* is a herb that occurs in heathy woodland. Maroon Leek-orchid *Prasophyllum frenchii* is an orchid of remnant grassland and grassy woodland.

A total 98 flora species recorded from the proposed Biosphere reserve are rare or threatened in Victoria (NRE Flora Information System). These include four species that are endangered at the State level, as follows:

Venus-hair Fern *Adiantum capillus-veneris* is a fern restricted to one creek on the southern Mornington Peninsula. Grey Billy-buttons *Craspedia canens* is an extremely rare daisy of grasslands north of Western Port Bay. Marsh Sun-orchid *Thelymitra longiloba* is a orchid found scattered in swampy heathlands. Merran's Sun-orchid *Thelymitra merraniae* is an orchid found on French Island.

Endangered and vulnerable species are also represented in the marine fauna of Western Port.

Marine mammals, including Humpback whales *Megaptera novaeangliae* and Southern Right Whale *Eubalaena australis*, have been sighted in Western Port (LCC 1993, NRE 1999).

The Weedy Sea Dragon *Phyllopteryx taeniolatus* also can be found in Western Port (Ferns 2000).

Endangered birds that may be found in the Western Port area include: the Swift Parrot *Lathamus discolor*, Orange-bellied Parrot *Neophema chrysogaster*, Grey-crowned Babbler *Pomatostomus temporalis*, White-bellied Sea Eagle *Haliaeetus leucogaster*, Little Tern *Sterna albifrons sinensis*, and Hooded Plover *Thinornis rubricollis* (NRE 1999).

One of four Australian Pelican *Pelecanus conspicillatus* permanent rookeries in Victoria is situated in the salt marshes of northern French Island. Similarly restricted breeding colonies for many other threatened bird species are sited in Western Port. Examples of these are the Pied Cormorant *Phalacrocorax varius*, Royal Spoonbill *Platalea regia* (NRE 1999). The world's largest Australian Fur Seal breeding colony is located at Seal Rocks, off The Nobbies, at the south-west tip of Phillip Island. Seal Rocks is a declared wildlife reserve for protection of Australian Fur Seals (LCC 1999, NRE 1999, RAC 1993, AHC 2002).

White-bellied Sea Eagles *Haliaeetus leucogaster* breed at only one known site on the Victorian coast west of Wilson's Promontory and this is sited in Western Port (NRE 1999).

French Island and Sandy Point have become valuable breeding sites for Koalas in Victoria. *Koalas Phascolarctos cinereus* are not native to French Island but were introduced to the island by local fishermen many years ago. Populations of Koalas elsewhere in the State have contracted the disease Chlamydia, which results in reproductive sterility in affected animals. Fortunately, the isolation of the island environment has kept the Koalas on French Island free of the disease (RAC 1993).

There are many identified sites of national and state significance in Western Port (Opie et al 1984, Andrew et al 1984, Rosengren 1984, Port Phillip CALP Board 2000, AHC 2002). Many of these sites are significant bird habitat sites.

The intertidal mudflats of the Western Port region contain many of the preferred (primary) feeding sites for waders. Secondary sites that are utilised by the birds in case of inclement conditions in their primary feeding sites are also a biologically important habitat. A third set of sites (the roosting sites) are utilised at high tide. Water birds generally roost to conserve energy, and these roosts are vulnerable to disturbance, birds becoming agitated when disturbed. Serious disturbance or degradation of the roosting sites can lead to birds not returning to the area. Thus the roosting sites are equally important habitat for the birds (RAC 1993).

Nationally significant sites include the primary foraging areas for waders, Yallock Creek mouth, Settlement Road at Lang Lang; Reef Island, and primary breeding areas on the north-western and southern coasts of Phillip Island. There are sites of state significance, including Yaringa, Tooradin and Bass River mouth. Secondary foraging areas of waders occur throughout the bay, with secondary breeding areas on Phillip Island–Swan Lake, and Rhyll Swamp (NRE 1999, Shapiro 1975).

Coastal areas of Phillip Island also contain major rookeries of the Little Penguin *Eudyptula minor* (WPCC 1980, NRE 1999).

Other vulnerable species are known to have restricted breeding colonies that are situated within Western Port. Some examples are:

■ Australian Pelican *Pelecanus conspicillatus*

■ Pied Cormorant *Phalacrocorax varius*

■ Royal Spoonbill *Platalea regia*

In addition to this, many of the birds found in Western Port are listed as threatened or vulnerable species (NRE 1999, Port Phillip CALP Board 2000).

The waters and coastline of Western Port are significant for migratory birds. Australia is a signatory to the *Japan–Australia Migratory Bird Agreement (JAMBA)*, the *China–Australia Migratory Bird Agreement, (CAMBA)*, and the *Bonn Convention*. Species listed under these international conventions are also listed under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth). A large number of bird species listed under these conventions are recorded from Western Port. Due to its significance, Western Port is also listed as a Wetland of International Importance under the *Ramsar Convention* (NRE 1999, Port Phillip CALP 2000).

The large number of terrestrial species of birds reflects the wide variety of terrestrial habitats within the region. For example, more than 271 species of birds may be found on the Mornington Peninsula. The number of birds sighted within a small geographic area can be quite surprising. More than 220 different species have been recorded in the Hastings region and on Phillip Island. Some species, such as Honeyeaters (other than the Helmeted Honeyeater) can be found within a wide range of habitats, other species have a more restricted range (WPCC 1980, AHC 2002).

Many common species include Laughing Kookaburras *Dacelo novaeguineae*, Galah *Cacatua roseicapilla*, Willy Wagtail *Rhipidura leucophrys*, Eastern Yellow Robin *Eopsaltria australis*, Crimson Rosella *Platycercus elegans*, Eastern Rosella *Platycercus eximius*, Superb Fairy-wren *Malurus cyaneus*, Australian Wood Duck *Chenonetta jubata*, and Red Wattlebird *Anthochaera carunculata* (Andrew et al 1984). Many birds such as the Red Wattlebird and the Superb Fairy-Wren may also be found in domestic gardens within the region.

Terrestrial birds also include rare or endangered species such as the Barking Owl *Ninox connivens*, Black Falcon *Falco subniger*, Swift parrot *Lathamus discolor*, Grey-crowned Babbler *Pomatostomus temporalis*, and Orange-bellied Parrot *Neophema chrysogaster* (NRE 2001b).

Australian mammals are unique on a global scale and include many marsupial species. A large number of these mammalian species may be found in the Western Port region. Of the 64 species found in Victoria, 31 are known in the Western Port catchment area. As many of these species are shy nocturnal animals, these figures may under-estimate the true incidence. However, it is known that these animals are particularly sensitive to habitat changes and their numbers have declined rapidly since European settlement and some have disappeared from the region (WPCC 1980, Andrew et al 1984, NRE 2001b).

Mammal species recently recorded include the monotremes (egg-laying mammals) Echidna *Tachyglossus aculeatus* and Platypus *Ornithorhynchus anatinus* (WPCC 1980, Andrew et al 1984, NRE 2000c).

Other marsupial species include the Koala *Phascolarctos cinereus*, Wombat *Vombatus ursinus*, several *Antechinus* species, various possum species, Eastern Grey Kangaroo *Macropus giganteus*, Swamp Wallaby *Wallabia bicolor*, and the rare species White-footed Dunnart *Sminthopsis leucopus*, New Holland Mouse *Pseudomys novaehollandiae*, and Long-nosed Potoroo *Potorous tridactylus*. A variety of species of bats are also found, including some rare species. A wide range of reptile and amphibian species have also been described, reflecting the wide range of micro-habitats and aquatic environments (WPCC 1980, NRE 2000c).

13.3 CONSERVATION OF GENETIC BIODIVERSITY

➔ **Indicate species or varieties of traditional or economic importance and their uses, eg, for medicine, food production, etc.**

Many native plants recorded from the proposed Biosphere reserve have traditional Aboriginal uses (Gott 1993). At least 228 of the recorded plant species are known to have traditional uses (NRE 2001a). Some examples follow:

TYPE OF PLANT	DESCRIPTION
Food plants	Aquatic plants, tuberous plants including Yam-daisy, orchids and lilies, plants with fibrous roots such as Austral Bracken
Medicinal plants	Plants containing tannins such as Acacias and River Red Gum, native mint species, sap from Cherry Ballart
Fibre plants	Plants with useful fibres such as Australian Hollyhock, Cumbungi and Spiny-headed Mat-rush
Implement plants	Plants used for tools and weapons such as Blackwood, Drooping Sheoak, Common Reed, River Red Gum
Adhesive plants	Plants used for making adhesives such as Austral Grass-tree

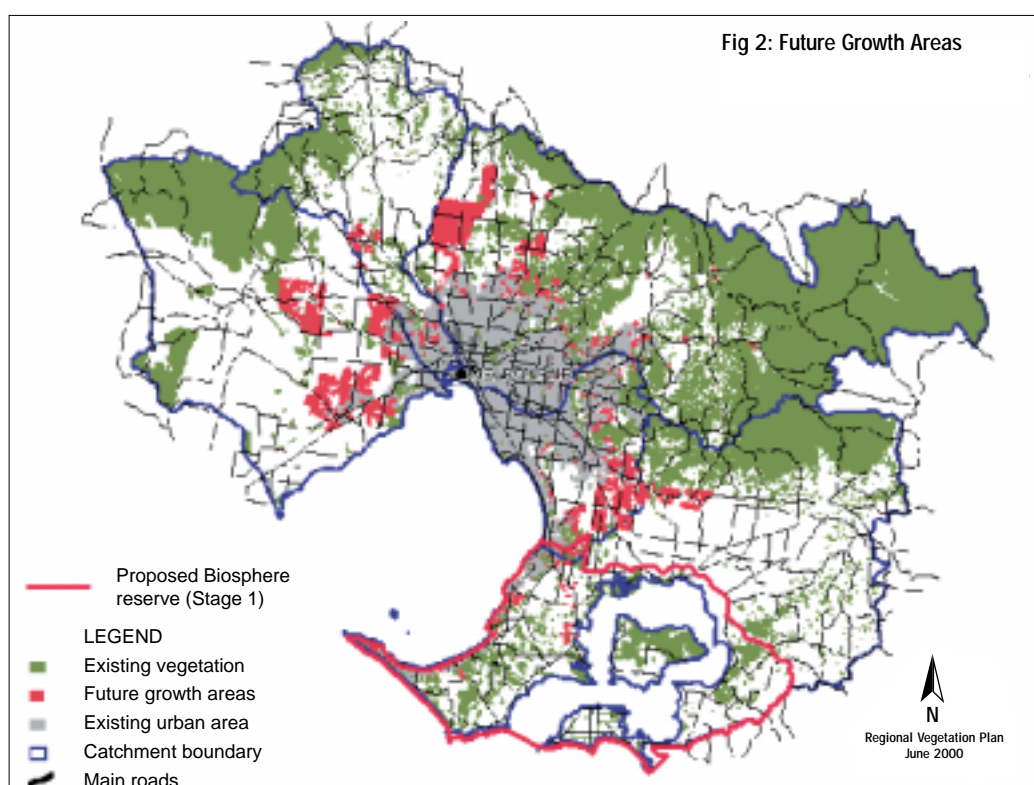
Native eucalypts form the basis of the timber industry in the north-east of the Western Port catchment (LCC 1991). Native fish sustain economically important fisheries in Western Port (Gunthorpe 1998, ECC 2000).

14. DEVELOPMENT FUNCTION

14.1 POTENTIAL FOR FOSTERING ECONOMIC AND HUMAN DEVELOPMENT.

The promotion of sustainability in the region is critical to future economic, social and ecological continuity. The region has enormous potential for fostering economic and human development, which is socio-culturally and ecologically sustainable for the following reasons:

- Being on the doorstep of Melbourne, it has ready access to a very wide range of universities and other research institutions, which have expertise in developing, implementing, and monitoring conservation and sustainable development and use strategies.
- Extensive community interest in sustainability. There is widespread community awareness and support for the Biosphere program. This is a result of a high level of environmental awareness and activities on the part of many individuals and groups since the 1960s. There are now more than 100 Bushland Friends' groups, Landcare, and local environmental associations in the proposed Biosphere region. These groups and individuals are involved in diverse environmental projects both on public and private land.
- An extensive world-class environmental database exists, on which to base such programs.
- Logistical infrastructure to facilitate such programs (eg, improved communication networks) can readily be developed, using both existing and new frameworks in an area recognised as having natural and cultural values of international and national significance on one hand, and enormous growth and development potential on the other.
- There are in the order of 2.5 million visits to the area annually of which a little over 30% of these stay overnight. Of those staying overnight, about 35% stay in their own holiday accommodation. This provides an opportunity for ensuring trips that include more than one destination, and the number staying overnight is increased. (Tourism Victoria 1996, Urban Enterprises 1999 & 2000).
- The mixture of rural and urban components of the area offer opportunities to balance the important components of consumption and production in achieving a balanced sustainable outcome.
- The area will be required to accommodate some of Melbourne's future growth (see fig. 2) within existing urban zoned areas while ensuring world-class conservation areas are protected. This major challenge will require careful planning and land management practices to be pursued. There is an opportunity to introduce innovative management regimes, which will minimise the threats to this area and ensure the viability of existing rural enterprises.



- Agricultural production from the Port Phillip and Western Port catchments is twice that of any catchment region in Victoria and more than three times the State average (Kellock et al 2000). The presence of viable agricultural activities and their continued contribution to the State's economy represents an opportunity for development of voluntary agreements through the Biosphere program while providing support for sustainable land-use planning.
- The area will contribute to the viability of Melbourne and Victoria's economy. Valuable resources must be protected from inappropriate development to achieve short-term objectives.
- Careful land-use planning by the responsible authorities must also ensure that land-use conflicts are avoided and the integrity of transport corridors are protected whilst public transport nodes are recognised as the focus for further urban development.
- The Port of Hastings with its deep water access and the very large area of port-related land is strategically important to Victoria. The recently completed Victorian Ports Strategic Study states:-
"At Hastings, container port development could be undertaken by extending the existing Tyabb reclamation northward, and/or in the area around The Bluff with extensive reclamation."
 This report looked at options for future port development and further indicated that:-
"A preliminary assessment of potential sites showed that Hastings would be the preferred site for future container development over Geelong though the impact on supply chain costs for Melbourne, shippers and environmental and social impacts, needs further assessment to verify this preliminary assessment."
 The report indicates that it is not until 2013 or 2015 that additional terminal capacity is likely to be required. This timeframe is, however, dependent upon the deepening of the shipping channel in Port Phillip Bay. Any further development of this Port must be based on sustainability principles and an opportunity may exist to progress the development of sustainability criteria with relevant agencies and interested parties, against which any proposal may be tested.
- The Mornington Peninsula and Phillip Island comprise a number of villages and townships, which have provided Melbourne with important recreational opportunities as holiday destinations. These places have the potential to lose their appeal if Melbourne's outward growth increases pressure for further subdivision and development. The integrity of these areas is important in preserving lifestyle and recreation opportunities for Melbourne, and the soon-to-be-released Melbourne Strategy may assist in addressing this issue.

Potential Biosphere Programs

- Recognition of existing environmental programs – eg, Landcare, Land for Wildlife, Port Environmental Management Plan preparation, planning schemes, National Park Management Plans, Seagrass Partnership, etc (and recognition of the integrated nature of the Biosphere reserve in those programs as they develop and are reviewed).
- Identification of opportunities for sectoral environmental management/improvement initiatives, eg, Navy, BHP, Lysaghts, golf courses, boat clubs, fishing clubs, boat tours, caravan parks, etc.
- Identification and development of responses to geographical environmental problems, eg, salinity, weeds, pest animal species, exotic marine organisms, mangrove/saltmarsh decline, sustainable fisheries, native vegetation (in the context of the imminent "net gain" principle).
- Identification and development of research programs responding to gaps in scientific knowledge of environmental systems in the Peninsula/Western Port area, including post-graduate thesis topics with partner support.
- Identification and development of programs responding to cultural and demographic needs (and resources) in the community; eg, indigenous, aged, unemployed, underemployed, vigorous retired, departing youth, etc.
- Identification of "Biosphere marketing" opportunities; eg, wine, ecotourism, port; adoption of unique Biosphere reserve name (Aboriginal), unique logo (name and logo to be copyrighted to the Foundation and use permitted under licence, subject to appropriate environmental commitments).
- Identification of process for monitoring/auditing Biosphere behavioural commitments to maintain integrity of program.
- Identification of benchmarking/monitoring opportunities; eg, enhancement of existing programs, integration of existing separate programs, state of environment reporting.
- Establishment/enhancement of programs for individual/ householder environmental improvement and management; eg, responsible stewardship, recycling, energy efficiency, water efficiency (information, brochures, incentives, accreditation, etc).
- Publicity/environmental awareness promotion through website, signage (including prominent signage on major approach routes – "Welcome to the Biosphere reserve" – partnering with Biosphere reserves overseas with which common features/attributes are shared (eg, elsewhere on the East Asian Flyway).

- Promote a greater awareness and understanding of the history of the area, the traditional owners of the land and impacts of European settlement of the area.

14.2 IF TOURISM IS A MAJOR ACTIVITY

- ➔ *How many visitors come to the proposed Biosphere reserve each year?
Is there a trend towards increasing numbers of visitors? (Give some figures if possible).*

Tourism is a major activity in the area.

The proposed Biosphere reserve incorporates the major parts of two of Victoria's tourism regions, the Bays and Peninsula region, which includes Mornington Peninsula, and Phillip Island and Gippsland Discovery (Tourism Victoria 1996 & 2002).

A brief overview is provided as follows:

Current visitation

REGION	DOMESTIC VISITORS (000S)	DOMESTIC VISITOR NIGHTS (000S)	INTERNATIONAL VISITOR NIGHTS (000S)
Phillip Island & Gippsland Discovery	791	4,835	56
Bays and Peninsulas	2,076	5,840	51
TOTAL	3,857	10,675	107

14.2.1 Type(s) of tourism

- ➔ *Study of flora and fauna, recreation, camping, hiking, sailing, horseriding, fishing, hunting, skiing, etc.*

Much of the tourism is nature-based. The Penguin Parade on Phillip Island attracts more than 500,000 visitors annually, of whom about 60% are from overseas. The most popular tourism activities in the proposed Biosphere reserve include beach use, wildlife viewing, bushwalking, fishing, boating, motorcycle racing, adventure recreation, golfing, camping, horseriding, and surfing. Features that also attract tourists include wineries, art galleries, shops and restaurants.

The area nominated for designation as the Biosphere reserve is the most visited area in Victoria outside of Melbourne. It is extremely popular, in particular, for its ecotourism (nature-based) attractions. Many of the core and buffer areas are very important destinations in this regard (Tourism Victoria 1996 & 2002).

SAFETY BEACH, DROMANA, MORNINGTON PENINSULA



14.2.2 Tourist facilities and description of where these are located and in which zone of the proposed Biosphere reserve

Tourist facilities occur in all three zones as follows:

Terrestrial core areas (within National and other parks). Only tourist facilities that are essential to the objectives of the zone, and have been approved in a management plan after public consultation, are permitted within core areas. No overnight tourist accommodation is permitted in this zone. Examples of appropriate facilities include recreation facilities for activities such as walking and camping, provision of access as appropriate, and information services to facilitate protection and enjoyment of the areas.

Terrestrial buffer areas (within National and other parks, reserves and public land and waters). The tourist facilities are as for terrestrial core areas above, except that commercial facilities also are permitted where they enhance the enjoyment and public appreciation of the area, without compromising natural qualities.

Transition areas (generally privately owned land). These may include towns and cities with a full range of supporting accommodation and other infrastructure. Marine transition areas include shipping channels and associated areas and facilities.

14.2.3 Indicate positive and/or negative impacts of tourism at present or foreseen

Tourism can have both positive and negative impacts as follows:

Positive aspects for local communities include enhanced lifestyle opportunities and greater prosperity. Ecotourism (nature-based tourism) in particular offers a vehicle for increasing awareness and promoting sustainable use of the natural and cultural resources of the area.


The potential negative effects of tourism generally arise from over-use, and include physical degradation of the natural and cultural assets, and also diminution of experiences – especially through overcrowding.

A very significant adverse impact of tourism relates to the potential to “over-use” sensitive sites, resulting in conflicts with local residents, and in some cases adverse impacts on the natural systems. Where there is a large permanent population, there is a need to share facilities. This often generates the question of who should pay for providing the facility or amenity. Many visitors to the area appreciate its beauty and proximity to Melbourne and seek out holiday or permanent accommodation, thereby adding to the impact of urbanism, which has the potential to destroy some of the intrinsic values of the area (MPSC 2001a).

The provision of tourist infrastructure, such as accommodation, may be inconsistent with the scale of activity appropriate to the area and seek to create a new destination rather than supplement the existing attractions (MPSC 2001b).

There are many benefits to be derived from the availability of employment opportunities close to where the labour force resides. Growth in employment arising from enhanced sustainability of industries in the proposed Biosphere reserve will therefore directly benefit the community. Sectors with potential for employment growth over time as economically sustainable development principles are embraced include tourism, recreational services, intensive agriculture, light and heavy industry, including activities related to the Port of Hastings, and education and research. Adoption of an economically sustainable development philosophy as a Biosphere reserve partner may enable some businesses to gain a competitive marketing advantage, with direct economic benefits to themselves and the region. This will also provide environmental and social benefits.

14.3 BENEFITS OF ECONOMIC ACTIVITIES TO LOCAL PEOPLE

 **Indicate for the activities described above whether the local communities derive any income or benefits directly or indirectly from the site proposed as a Biosphere reserve, and through what mechanism.**

The economic benefits of tourism values in the core and buffer zones are extremely important. For example, the Penguin Parade generates more than \$100 million of economic activity to Victoria. Collectively, the remaining parks and reserves in the proposed Biosphere reserve would be expected to generate similar economic benefits.

The benefits include direct employment in the management of these areas, direct provision of support services, and provision of support infrastructure in the transition areas. The creation of the Biosphere reserve is expected to enhance these economic returns through generating new opportunities, especially from marketing advantages arising from a greater international profile, new clean and green industries, and from nature-based tourism.

15. LOGISTIC SUPPORT FUNCTION

15.1 RESEARCH AND MONITORING

The proposed area has been and continues to be the subject of a large amount of research and monitoring. Research into the ecology of the region, and the monitoring thereof, has been relatively recent and largely limited to core and buffer areas. Mapping ecological vegetation classes (EVC) has recently been completed across the State. Some landmark broad-scale studies that would appear to have been scientifically ahead of their time were undertaken in the 1970s and include core, buffer and transition zones in their scope (Champion 1974, ERA 1974, Seddon 1974, Shapiro 1975). Isolated studies in the transition zones have also been undertaken for special purposes, such as preparation of management plans and planning schemes or for assessment of development proposals.

Until recently, most routine applied research and monitoring conducted by the various authorities in the region have been directed to pollution control and to the needs of agriculture (eg, salinity, water-flow rates, etc.).

At the local government level, a substantial volume of independent reports on environmental impacts contains valuable detailed data on flora and fauna communities for smaller areas within the transition zone. To date this information has generally not been in the public domain.

Given the number and range of activities, only a few examples are given in the sections below.

15.1.1 To what extent has the past and planned research and monitoring program been designed to address specific management questions in the potential Biosphere reserve?

Much of the past research and monitoring program has been designed to address specific management questions in the proposed Biosphere reserve.

An estimate of the biological complexity and economic importance of the area may be gained from the volume of scientific studies undertaken on the region over many decades. Successive governments have commissioned and funded significant scientific research in the region, totalling many millions of dollars. No complete bibliography is available of all the scientific work undertaken, and several bibliographic holdings in excess of 1000 entries are still considered to be incomplete.

Sequential major studies and reviews have also repeatedly recognised the scientific importance of the region and the magnitude of the task of any serious study of the region (Champion 1974, ERA 1974, Loyn 1975, Shapiro 1975, Loyn 1978, Andrew et al 1984, Opie et al 1984, LCC 1991, 1993 & 1994, Port Phillip CALP Board 2000).

Much of the past research activity undertaken by universities has been pure research, some of which has had practical application. Government research agencies have always undertaken more applied research and monitoring. A large and increasing proportion of research is now targeted at specific management questions. For example, Parks Victoria has a Research Partners Program with several research organisations including three universities. Under this program, Parks Victoria identifies proposed core and buffer management issues, and then sponsors relevant research. Three such projects have been conducted within Mornington Peninsula National Park (eg, McGregor 1989).


Active applied research and monitoring is carried out in the region by many organisations, including the Environment Protection Authority (EPA), NRE, Phillip Island Nature Park, Parks Victoria, Melbourne Water, Southern Rural Water, and catchment authorities. In addition, independent researchers have been contracted to report to all levels of government on specific projects. This has been translated into advice to government on the framing of policy, into management plans and in some cases into remedial action. This process of applied research and monitoring is continuing.

Some examples:

- University researchers have been involved in undertaking research on the behalf of government. Such was the case in the 1970s and 1980s with extensive research and landmark reports by Shapiro (1975), Seddon (1974) and others. Information and advice from these reports were used to formulate the basis of the planning scheme and planning decisions for Western Port and the Mornington Peninsula, and also for formulating State Government policies for the area in general.
- Research and monitoring is undertaken by Parks Victoria for the preparation of management plans and the ongoing management of parks under their control.
- Local governments in the region require environmental assessments to be undertaken as part of the planning application process for some types of development. These reports are taken into consideration when assessing whether approval will be given.

- NRE monitors and maps soil acidity, salinity and sodicity, as well as water quality in agricultural areas (see NRE website at <http://www.nre.vic.gov.au>). Among other things, these data are used in the planning and application of land-care programs by agricultural groups and in ground-water extraction licensing within the region.
- EPA monitoring of water quality in streams and bays has led to policy development for Western Port and an active program of conservation/ restoration action (eg, *State Environment Protection Policy Water of Victoria Schedule F8 Western Port and Catchment, and Western Port 'Action +' Program*). Data and EPA reports can be viewed at EPA website: <http://www.epa.vic.gov.au>.
- Extensive research into the ecology of the Little Penguin by the research department of the Phillip Island Nature Park.
- The Victorian Ports Strategic Study has been prepared to address issues relating to the use and development of Victoria's ports and provide an infrastructure framework to guide Government land and transport planning decisions.

15.1.2 Brief description of past research and/or monitoring activities

 **Indicate the dates of these activities and extent to which the research and monitoring programs are of local/national importance and/or of international importance.**

A large body of research and monitoring has been undertaken within the proposed Biosphere reserve. This is due to its physical and biological diversity, its geographic size, its complex environmental management issues, and its proximity to a large urban area (Melbourne) with several research organisations.

As previously mentioned, a major series of government environmental investigations was conducted on the Western Port coastal area in the 1970s. In particular the Shapiro study (Shapiro 1975) had local and national importance and was probably world-best practice at the time.

The existing research base is somewhat piecemeal, and there is a need for an overarching program to co-ordinate and guide research and monitoring. Establishment of a Biosphere reserve may facilitate a more strategic approach.

Research organisations that have undertaken research and monitoring include:

- Arthur Rylah Institute for Environmental Research (ARI).
- Australian Bureau of Statistics (ABS).
- Australian Research Centre for Urban Ecology (Royal Botanic Gardens Cranbourne).
- Commonwealth Scientific and Industrial Research Organisation (CSIRO).
- Deakin University.
- Keith Turnbull Research Institute (KTRI).
- Land Conservation Council (LCC).
- La Trobe University.
- Marine and Freshwater Resources Institute (MAFRI).
- Melbourne Water.
- Monash University.
- Phillip Island Nature Park.
- RMIT University.
- The University of Melbourne.
- Victorian Institute of Animal Science (VIAS).

◆ **Abiotic research and monitoring (climatology, hydrology, geomorphology, etc)**

A considerable amount of abiotic research and monitoring has been undertaken. For example, MAFRI has undertaken chemical studies

of the waters of Western Port, and Melbourne Water (the major water supply agency for Melbourne) has monitored the water quality of streams in terms of aquatic macroinvertebrates, sediment toxicants and physico-chemical properties. (See Melbourne Water website at <http://melbournewater.com.au/> for data and online reports.)

A government geomorphological assessment was conducted by Rosengren (1984). This benchmark study did result in a discernible influence on planning and conservation.

◆ Biotic research and monitoring (flora, fauna)

A large amount of biotic research and monitoring has been undertaken by research organisations and individuals. A recent bibliography of biodiversity literature on the Melbourne area lists references relating to local government areas, identifying hundreds of references relevant to the proposed Biosphere reserve (McDonnell et al 1999).

A new bibliography of publications on Western Port is due to be released in the near future (Central Coastal Board-in press).

A considerable number of the biodiversity references are consultant reports, reflecting the increasing urban development in the area (McDonnell et al 1999).

Two important government environment assessments of vegetation and fauna were undertaken in the 1980s (Opie et al 1984, Andrew et al 1984). Neither of these benchmark studies resulted in having a major effect on planning or conservation. Since then, the natural values of the Western Port catchment have declined markedly, as vegetation clearance for farming and housing development continued through the 1980s and 1990s. Subdivision and clearance has reduced or eliminated much bushland remnants on private land – many documented sites – and incremental clearance continues.

Water catchment management studies, including soil erosion, water quality, sea-grass health, distribution and restoration and pest plant and animal control research have major implications for future management. Several biological control agents have been released within the proposed Biosphere reserve by KTRI, after having undergone rigorous host specificity testing.

◆ Socio-economic research (demography, economics, traditional knowledge, etc)

KTRI has undertaken economic analysis of invasive plant species (Parliament of Victoria 1998). LCC has also covered this issue.

A five-yearly national census, most recently undertaken in August 2001, provides a comprehensive demographic database, which can now be interrogated with a high degree of resolution once the data have been collated. Figures contained in this nomination are based on data from the 1996 census, because at the time of writing the 2001 census data was not yet available. The census data provide valuable benchmark information, which can be analysed at a regional level consistent with the scale of the proposed Biosphere reserve, for use in conducting and interpreting socio-economic research in the area.

The Mornington Peninsula Shire Council also has a detailed population survey (Mornington Peninsula Shire Community Profile), based on the Bureau of Statistics data, available on their website at: <http://www.mornpen.vic.gov.au>.

15.1.3 Brief description of on-going research and/or monitoring activities

– See also attached literature bibliography

◆ Abiotic research and monitoring (climatology, hydrology, geomorphology, etc)

Monitoring of water quality by Melbourne Water is ongoing. Ongoing applied research and monitoring includes:

- EPA chemical turbidity and suspended solids monitoring of streams. EPA website: <http://www.epa.vic.gov.au>.
- Climatic data that are collected by the Bureau of Meteorology (Australia) at many sites within the region as well as from satellite imaging. Bureau of Meteorology website: <http://www.bom.gov.au>.
- The Geological Survey of Victoria program (NRE) and seismic monitoring. NRE website: <http://www.nre.vic.gov.au>.
- Hydrology is monitored by Water Catchment Boards and at local government level (eg, abiotic and biotic data collected by NRE can be viewed at their site "Victorian resources Online" at <http://www.nre.vic.gov.au/web/root/Domino/vro/vrosite.nsf/pages/vrohome>).

◆ Biotic research and monitoring (flora, fauna)

A considerable amount of research and monitoring is ongoing within the Biosphere reserve. Some examples are given here. Monash University is studying genetic variation in seagrasses. RMIT University is researching the impacts of biocides on the fresh and marine waters of Western Port, and surface water run-off on dairy farms in the Bass River catchment. KTRI is researching and monitoring several invasive plant species and invertebrate pests in relation to biological control. VIAS is researching and monitoring several feral animal species. MAFRI is researching fishing gear selectivity to reduce by-catch and the impacts of introduced marine invertebrates, and is monitoring seagrasses and fish stocks. Phillip Island Nature Park carries out research and monitoring of Little Penguins, sea birds, shore birds, and land and sea mammals. The Bird Observers Club of Australia has been monitoring sea and shore birds of Western Port since 1984, and has collected much valuable data on waterbirds, particularly international migratory waders. Shore birds are counted at 20 high tide roosting sites in Western Port three times a year.

◆ Socio-economic research (demography, economics, traditional knowledge, etc)

A number of organisations are involved in ongoing studies of the communities of the area. This work includes studies by LGAs and the ABS into the demographic and economic profiles of these communities. DNRE is conducting a study into the traditional use of native plants by Aboriginal Victorians. Other socio-economic research is being conducted by the DOI.

15.1.4 Brief description of planned research and/or monitoring activities

Planning of research and especially monitoring is increasingly difficult for most or all of the research organisations due to ongoing funding uncertainties. Research and monitoring will continue, but they are likely to remain piecemeal and unco-ordinated unless there is an overall framework. This work may form an important initial project for the Biosphere reserve program.

◆ Abiotic research and monitoring (climatology, hydrology, geomorphology, etc)

Melbourne Water will continue to monitor water quality. Research into geology and geomorphology is ongoing; for example, a PhD research project on fossil brachiopods on the Mornington Peninsula.

◆ Biotic research and monitoring (flora, fauna)

KTRI plans to research biological control of *Spartina* (a marine pest plant), which is a major threat to estuaries and waterbird habitats in Western Port.

VINEYARDS, MORNINGTON PENINSULA



◆ **Socio-economic research (demography, economics and traditional knowledge)**

Community sectors with particular needs and issues that might be addressed by future research, especially locally based research, could include youth, single-parent families, unemployed (especially long-term unemployed), the indigenous community and the elderly. There would be potential for promoting locally focused post-graduate research topics, especially in the context of new or expanded tertiary training institutions associated with the proposed Biosphere reserve. The unusual proximity of the low population growth areas contained within the proposed Biosphere reserve to the south-eastern metropolitan growth area just to the north might also offer fertile ground for detailed research. The precise nature of socio-economic research topics that could be pursued or promoted would result from close consultation between local government, educational institutions, community and service organisations and business groups that might sponsor such research.

15.1.5 Estimated number of national scientists participating in research within the proposed Biosphere reserve

◆ on a permanent basis: 5 (Phillip Island Nature Park)

◆ on an occasional basis: 100–150

15.1.6 Estimated number of foreign scientists participating in research within the proposed Biosphere reserve

◆ on a permanent basis: 0

◆ on an occasional basis: 10–20

15.1.7 Estimated number of masters and/or doctoral theses carried out on the proposed Biosphere reserve each year

10–20

15.1.8 Research station(s) within the proposed Biosphere reserve

1 permanent 12–15 temporary

There is one permanent research station within the proposed Biosphere reserve. It is located in the Phillip Island Nature Park and focuses on seabird research – especially the Little Penguin. However, all of the other listed research organisations are adjacent to the proposed Biosphere reserve (in the Melbourne metropolitan area).

Monash University (Peninsula Campus) is situated at Frankston on the border of the reserve and has a comprehensive on-site library with electronic links to other tertiary institutions and libraries worldwide. Research into fungal diseases of grapevines is undertaken there also. Environmental science research and teaching is also undertaken from the Monash University campus at Berwick in Gippsland. TAFE colleges within the area include campuses at Rosebud. Other first-class world-standard research institutes, such as RMIT University and University of Melbourne, are within 60 to 90 minutes' drive of the proposed Biosphere reserve. The reserve area is used extensively by the universities as a resource for research and for teaching. An estimate of the involvement of these institutions can be seen in a review of the literature in (McDonnell et al 1999) which can be viewed at: <http://www.arcue.rbgmelb.org.au>.

15.1.9 Permanent monitoring plots

➔ *Indicate the year established, the objective of monitoring, the type and frequency of observations and measurements, and whether an internationally recognised protocol is being used, for example, the Smithsonian-MAB MAPMON protocol for monitoring forest biodiversity.*

There are few permanent biodiversity monitoring plots, although some of the baseline studies undertaken by universities could be incorporated into longer-term monitoring. The NRE Flora Information System (NRE 2001a) contains records of more than 3000 vegetation quadrats from the proposed Biosphere reserve, which could be relocated and monitored in the future. NRE has approximately 10 Continuous Forest Inventory Plots in the north-east of the Western Port catchment; these are measured every five years. Melbourne Water has a number of permanent water sampling points. KTRI has a number of monitoring plots for effectiveness of biological control. EPA has implemented a major environmental monitoring program in the region.

Birds of Australia and other organisations have collected over 20 years' of observations.

15.1.10 Research facilities of research station(s)

➔ *Meteorological and/or hydrological station, experimental plots, laboratory, computerised databases, Geographical Information System, library, vehicles, etc.*

The research station at the Phillip Island Nature Park is well established with appropriate facilities. The Royal Botanic Gardens Cranbourne (Australian Research Centre for Urban Ecology) is also well suited for its purposes.

Other facilities at research stations located outside the Biosphere reserve are used to monitor values within the proposed Biosphere reserve area. These include the Flora Information System, the Atlas of Victorian Wildlife, the Victorian Fish Database and the GIS database of Natural Resources and Environment and Parks Victoria's Environmental Information System (See NRE website at <http://www.nre.vic.gov.au> for further information and links).

15.1.11 Other facilities

➔ *Eg, facilities for lodging or for overnight accommodation for scientists etc.*

Because of the proximity to Melbourne and reasonable access to most of the proposed Biosphere reserve, special overnight accommodation for scientists is not necessary in core and buffer areas. However, a wide variety of accommodation in the transition area is available to serve the needs of the proposed Biosphere reserve. Accommodation for visiting school groups is especially important and is being provided where a demand is being generated – eg, Phillip Island, Grantville and French Island.

15.1.12 Does the proposed Biosphere reserve have an Internet connection?

Many Internet connections are available including the following sites of the Biosphere reserve founding partners:

- Parks Victoria for French Island National Park and Mornington Peninsula National Park: www.parkweb.vic.gov.au.
- Mornington Peninsula Shire: www.mornpen.vic.gov.au.
- Department of Infrastructure: www.doi.vic.gov.au.
- Department of Natural Resources and Environment: www.nre.vic.gov.au.
- Bass Coast Shire: www.basscoast.vic.gov.au.
- Phillip Island Nature Park: <http://www.penguins.org.au>.
- RMIT University: <http://www.rmit.edu.au>.
- South East Water: <http://www.southeastwater.com.au>.

15.2 ENVIRONMENTAL EDUCATION AND PUBLIC AWARENESS

➔ *Environmental education – sometimes now referred to as education for sustainable development – can be aimed at school children, the adult population of the local communities, and visitors from home and abroad.*

An important role of all the parks and reserves in the Biosphere reserve program is to further their objectives through environmental education of primary, secondary and tertiary students in the areas of natural history, sustainable management of natural systems, ecological balance, and heritage protection.

There are many primary and secondary schools in the proposed Biosphere reserve. At secondary level, these schools offer a range of environment-related subjects, such as Environmental Science, Marine Science, Agricultural Science and Geography. The Curriculum Standards Framework guides the curriculum for all Victorian schools and includes studies of the natural world, the local environment, environmental change over time, natural resource management, patterns of land use, biological basis of classification of organisms, interactions between living things and their non-living surroundings, practices and strategies for the sustainable interaction of humans and outdoor environments, processes of decision-making that affect the use and sustainability of outdoor environments, human-induced environmental change and the options for remediation.

In Victoria, there are nine universities and a number of Technical and Further Education (TAFE) providers and more than 500 tertiary courses offered through the Victorian Tertiary Admissions Centre in the fields of agriculture, environment and natural and physical sciences (See VTAC website at <http://www.vtac.edu.au>). The institutions in the proposed Biosphere reserve include Chisholm TAFE at Cranbourne and Rosebud. Victorian universities are internationally recognised for their high quality of education.

The RMIT University is a founding partner of the Biosphere reserve. The faculties interested in the Biosphere reserve include the Sustainability Unit and the Geospatial Science Initiative (See website at <http://www.rmit.edu.au>). Other universities have demonstrated their interest in becoming involved in Biosphere reserve programs. These include Monash University and Deakin University (<http://www.monash.edu.au> and <http://www.deakin.edu.au>).

There is a high level of awareness among the population of the Biosphere reserve of the environmental issues facing the bioregion. This nomination is a measure of their awareness and concern for the health of the area.

15.2.1 Describe environmental education and public awareness activities, indicating the target group(s)

The parks having the core and buffer areas have a long history of providing education services. These include comprehensive programs for pre-school, primary, secondary and tertiary institutions and specialist groups. Delivery is usually by rangers in the field and includes a combination of ranger talks, guided walks and/or hands-on education and conservation activities in which students achieve greater knowledge of environmental issues and management strategies. Besides students, other target groups include local, national and international special interest groups (eg, bird observers) and community groups, including retirees.

The Biosphere reserve program is expected to lead to a widening of education services, which includes greater emphasis on children with learning and other disadvantages, and also more emphasis on encouraging wider understanding and acceptance of ecologically sustainable practices. The development of working models will be an important part of this approach.

Community awareness and involvement will be facilitated through major publicity programs, with brochures explaining Biosphere programs. The grassroots support from local friends and volunteer groups and their supporters will also be an important aspect of this work. Training of educators will also be undertaken.

Environmental education and public education programs are also run by the Royal Botanic Gardens in Cranbourne, South-East Water, and the Phillip Island Nature Park. The Phillip Island Nature Park attracts about 10,700 students annually.

A significant number of organisations supporting the Biosphere reserve run public awareness activities to address environmental issues. These include campaigns by Biosphere reserve partners – local government, South East Water and Parks Victoria, to:

- Control pest plants/animals and weeds.
- Encourage indigenous planting.
- Guide responsible water usage.
- Encourage recycling.
- Reduce rubbish and litter.
- Protect endangered species.
- Communicate environmentally responsible behaviours.

The campaigns cover a range of communication media, including brochures, signage, fact sheets, web pages, education programs, media releases, newspaper articles and advertisements.

The Department of Natural Resources and Environment runs a number of community monitoring and sampling programs, including Waterwatch, Saltwatch, and macro-invertebrate sampling in autumn and spring.

In addition, there are a number non-government organisations that aim to raise public awareness with regard to environmental issues in the broader Victorian community. They include the Australian Conservation Foundation and the Victorian National Parks Association.

Another important Biosphere partner, the Frankston and Mornington Peninsula Local Learning and Employment Network (LLEN) is co-ordinating a project with several primary and secondary schools in the Biosphere, called Schools of the Biosphere. The pilot program aims to incorporate sustainability into all school activities and develop the relationship between primary and secondary students based on this project.

15.2.2 Indicate facilities for environmental education and public awareness activities (visitor centres; interpretative programs for visitors and tourists; nature trails; ecomuseum demonstration projects on sustainable use of natural resources)

The parks forming the core and buffer areas already have visitor centres, interpretative programs for visitors and tourists, and nature trails. It is proposed to create new centres for sustainability outside core and buffer areas within the transition area. These centres will be a major feature of the Biosphere reserve.

The Mornington Peninsula Shire Council is preparing a strategy for development of a centre for sustainability on the Mornington Peninsula. This centre will provide facilities for research and community involvement in sustainability initiatives through voluntary partnerships.

Ecotourism involving private tour operators and associated infrastructure (accommodation, transport, etc) is also expected to make a major contribution.

15.3 SPECIALIST TRAINING

➔ *Acquisition of professional skills by managers, university students, decision-makers etc). Describe specialist training activities; for example, research projects for students; professional training and workshops for scientists; professional training and training for staff in protected area management, workshops for resource managers and extension services to local people.*

Specialist training will involve the following approaches:

- Community workshops covering environmental, economic and social issues.
- Offering postgraduate research scholarships.
- Seminars for key decision-makers and community leaders.
- Staff and student exchange programs with other Biosphere reserves.
- Offering specialist short courses.
- Training for staff in protected areas.
- Workshops for resource managers and planners.
- Extension services to local people.
- Field excursions.

15.4 POTENTIAL TO CONTRIBUTE TO THE WORLD NETWORK OF BIOSPHERE RESERVES

➔ *Collaboration among Biosphere reserves at a national, regional and global level in terms of exchange of scientific information, experience in conservation and sustainable use, study tours of personnel, joint seminars and workshops, Internet connections and discussion groups, etc.*

The proposed Biosphere reserve has a very significant potential to contribute to the World Network of Biosphere Reserves.

In the case of relationships with Biosphere reserves in other developed countries, the issues of land and water degradation, and challenges of sustainable development close to a significant population centre are highly relevant. Moreover, the ready access to research institutions and availability of sophisticated monitoring systems should provide leadership in pursuing Biosphere reserve goals.

The presence of towns and cities in this proposed Biosphere reserve also provides potential for new studies in research and monitoring as the world becomes more urbanised.

The proposed Biosphere reserve has substantial potential to contribute, especially within the Australasia-Pacific region, particularly in supporting and learning from Biosphere reserves in developing countries in the region. Sections of the community within the proposed Biosphere reserve have already developed assistance programs with East Timor. For example, the Mornington Peninsula Shire has a program of assistance in East Timor and Parks Victoria is exploring opportunities to provide support for Timor's evolving protected area network. Also, managers of core and buffer areas here are developing training programs in resource management and planning for East Timor. Other countries in the region will benefit substantially from similar training programs and export of expertise from the Biosphere reserve.

Collaboration among Biosphere reserves in exchange of scientific information, experience in conservation and sustainable use, study tours, joint seminars and workshops, Internet connections and discussion groups, will equally benefit this Biosphere reserve.

After completion of nomination, the identification of an appropriate sister Biosphere reserve is expected to provide exciting and effective global links that will advance the cause of the UNESCO Biosphere program. In this context, the proposed Biosphere reserve is seen as truly reflecting the ideals of the UNESCO Biosphere program and the Seville Strategy.

15.4.1 Collaboration with existing Biosphere reserves at the national level

A framework already exists in Australia for encouraging collaboration of Biosphere reserves at the national level. This is facilitated by Environment Australia (a Commonwealth Government agency). Procedures include the holding of national workshops for Biosphere managers, preparation and distribution of Biosphere newsletters, and technical advice on Biosphere management.

The preparation of this nomination has involved a presentation at the 2001 national workshop for Biosphere reserve managers, and liaison with the National Commission for UNESCO.

The next annual meeting of Australian Biosphere reserve managers is scheduled to be held within this Biosphere in August 2002.

It is planned to maintain and strengthen this national collaboration after nomination.

15.4.2 Collaboration with existing Biosphere reserves at the regional or subregional levels, including promoting transfrontier sites and twinning arrangements

➔ *Indicate ongoing or planned activities. Here, "regional" refers to the regions as Africa, Arab region, Asia and Pacific Latin America and the Caribbean, Europe. Transfrontier Biosphere reserves can be created by two or more contiguous countries to promote cooperation to conserve and sustainably use ecosystems that straddle the international boundaries. Twinning arrangements usually consist of agreements between sites located at some distance in different countries to promote activities such as co-operative research projects, cultural exchanges for schoolchildren and adults, etc.*

As indicated in section 15.4, above, collaboration with Biosphere reserves in the Australasia-Pacific region will have a high priority and be considered further when "twinning agreements" are pursued. Activities such as co-operative research projects, cultural exchanges for schoolchildren and adults, training programs for core and buffer managers and conduct of regional seminars are envisaged.

15.4.3 Collaboration with existing Biosphere reserves in thematic networks at the regional or international levels

➔ *Indicate ongoing and planned activities. Networks of sites which have a common geographic theme, such as islands and archipelagoes, mountains, or grassland systems, or a common topic of interest such as ecotourism, ethnobiology, etc.*

Expected common interests or themes include islands, migratory birds, wetlands, ecotourism, water catchment management, and marine ecosystems.

15.4.4 Collaboration with existing Biosphere reserves at the international level

➔ *Indicate ongoing and planned activities: (Notably through Internet connections, twinning arrangements, bilateral collaborative research activities, etc.)*

See above.

16. USES AND ACTIVITIES

16.1 CORE AREA(S):

16.1.1 Describe the uses and activities occurring within the core area(s)

➔ *While the core area is intended to be strictly protected, certain activities and uses may be occurring or allowed, consistent with the conservation objectives of the core area.*

The following activities are permitted in core areas in accordance with zoning prescribed by park and other protected area management plans, which determine uses within Biosphere zones.

- Provision of interpretation experiences.
- Education programs.
- Wildlife and nature appreciation.
- Picnicking.
- Cycling, walking, swimming and beach access.
- Vehicle access.
- Research.

16.1.2 Possible adverse effects on the core area(s) of uses or activities occurring within or outside the core area(s)

➔ *Indicate trends and give statistics if available.*

The adverse effects are minimised by park planning and management with regard to controlling human use of the areas. Adverse effects from outside core areas include invasion by pest plant and animals, and damage from wildfire. Many of the pest plants are exotic species such as Blackberry, Boneseed, African Boxthorn and Cape Ivy. Common pest animals include foxes, rabbits, and feral and domestic cats and dogs. These are controlled by appropriate responses, including weed and animal eradication programs, including trapping, poisoning, and shooting to reduce or eliminate the sources of the threat. Fire management involves both protection and suppression measures (Coveny 1990, LCC 1994).


There are at least 30 priority weed species requiring development of control response strategies (Parliament of Victoria 1998).

Another major threat to coastal core (and buffer zones) is oil spills from passing ships. Such a contingency may activate major disaster planning, which may require both state and national resources to address (ANZECC 1995 & 1999).

16.2 BUFFER ZONE(S)

Terrestrial buffer zones initially involve public-owned land, either adjoining or surrounding core areas, and separate smaller park areas, generally isolated from core areas.

16.2.1 Describe the main land uses and economic activities in the buffer zone(s)

 *Buffer zones may support a variety of uses that promote the multiple functions of a Biosphere reserve while helping to ensure the protection and natural evolution of the core area(s).*

Buffer zones that are parks may have similar activities to core areas (see section 16.1.1). In addition, they may have other activities as follows:

- Visitor centres.
- Horse riding/trail bike riding.
- Dog walking.
- Commercial activities (sale of souvenirs).

In the case of marine buffer areas, the activities provided for in the Strategic Management Plan for the Western Port Ramsar site, when finalised and approved by government, will guide management. The existing uses for the Ramsar area include:

- Fishing.
- Sand extraction.
- Agriculture.
- Recreation.
- Aquaculture.
- Port development.

The draft Strategic Management plan is currently on display for receipt of community input. The draft can be viewed at the Parks Victoria website <http://www.parkweb.vic.gov.au/>.

16.2.2 Possible adverse effects on the buffer zone(s) of uses or activities occurring within or outside the buffer zone(s) in the near and longer terms

Terrestrial buffer zones can experience the same threats as for core zones (see above). However, it is expected that much of the control and eradication work will take place on the buffer zones once infestations in the core zones have been minimised. Where private land is included in the buffer zone, compatible land management practices and/or facilities may be established at the private landholder's discretion.

Friends of Parks (volunteer) local community organisations make major contributions to park protection works in both core and buffer zones. Other important volunteer organisations such as Park Neighbour and LandCare groups also make major contributions.

The risks to the marine buffer zone (Draft Strategic Management Plan Parks Victoria 2002) include:

- Altered water regime.
- Salinisation.
- Pollution.
- Pest plants.
- Pest animals.
- Resource utilisation.
- Dredging.
- Recreation.
- Erosion.

16.3 TRANSITION AREA

➔ *The Seville Strategy gave increased emphasis to the transition area, since this is the area where the key issues on environment and development of a given region are to be addressed. The transition area is, by definition, not delimited in space, but rather is changing in size according to the problems that arise over time. Describe briefly the transition area as envisaged at the time of nomination, the types of questions to be addressed there in the near and the longer terms. The size should be given only as an indication.*

16.3.1 Describe the main land uses and major economic activities in the transition area(s)

The transition areas are described in detail in the *Port Phillip and Western Port Regional Catchment Strategy*, which is available online at <http://www.nre.vic.gov.au/catchmnt/partner/portphil/portcon.htm>.

The variety and quality of the natural features and recreational opportunities in the Port Phillip and Western Port region contribute significantly to Melbourne's reputation as one of the world's most liveable cities. Many of these features also provide some of Victoria's most popular tourist destinations, estimated to generate \$400 million annually to the region (Port Phillip CALP Board 1998).

The diverse pattern of land use provides a rich cultural landscape which is highly valued by both residents and visitors ... the Mornington Peninsula is renowned for its rural character and spectacular coastal views (Port Phillip CALP Board 1998).

The Western Port catchment comprises 144,000 hectares of agricultural land, which supports 1840 farm businesses with gross annual value of production of \$450 million. "This land is some of the most productive in the State with dairying and horticulture being prominent. There is also a growing wine industry on the Mornington Peninsula. The Koo Wee Rup area is of particularly high agricultural value." (Port Phillip CALP Board 1998).

The coastline and forested hills of the upper catchment support some of Victoria's most valuable natural areas. The intertidal mudflats and mangroves are one of the 10 areas of Victoria listed under the *Ramsar Convention*. The bay area also provides habitat for 43 migratory bird species and is protected under Australia's international treaties with Japan and China, *JAMBA and CAMBA* (Port Phillip CALP Board 1998).

The waters of Port Phillip Bay and Western Port and Bass Strait contain significant fisheries, and recently announced marine parks will offer added opportunities to enhance the protection of the fish stocks in this area. These fish stocks provide an important component of the local food market and provide export income. In addition to protection of breeding areas, there is a need to ensure the future growth of Melbourne does not adversely impact on the water quality and food chain required to support the diversity and integrity of these fisheries.

There are significant stone resources in this area, which contribute substantially to Melbourne's building and construction industry and these resources, as with the highly fertile agricultural land, must be protected from inappropriate development that has the potential to alienate these resources.

The landscape and natural features of the catchment make it the most visited in Victoria, with over three million visits per year. Phillip Island, in particular, attracts many visitors from both Melbourne and overseas with the Penguin Parade being one of Victoria's most popular attractions. Mornington Peninsula National Park and Arthurs Seat State Park, along with the bayside beaches south of Frankston and the Bass Strait surf coast, also help to make Western Port the most important recreation and tourist destination in the State.

16.3.2 Possible adverse effects of uses or activities on the transition area(s)

Changing land use

The Western Port catchment is expected to accommodate about 8% of the total population growth for greater Melbourne over the next 15 years. The municipalities of Casey and Cardinia will together house a projected 110,000 new residents by the year 2011 (Port Phillip CALP Board 1998).

Extremely sensitive and innovative planning for this growth and required infrastructure is important to ensure that the character and values of the catchment are protected. Similarly, changes to larger agricultural farming units have the potential to impact on vegetation and increase nutrient-laden runoff to Western Port.

The Port Phillip and Western Port Regional Catchment Strategy (Port Phillip CALP Board 1998) also identifies the following issues:

Altered flood regime – Increased potential for flooding of the agricultural land in Koo Wee Rup Longwarry area due to storm water runoff from new urban areas.

Water pollution – New development including shipping in Western Port has the potential to increase pollution. Similarly inadequate infrastructure at present needs to be upgraded to reduce adverse impacts: eg, sewerage and stormwater.

Incomplete waterway management – Part of the Mornington Peninsula does not have a waterway management authority.

Loss and degradation of native vegetation – Native vegetation on private land needs to be carefully managed and protected from inappropriate development.

Incompatible land management – Management of off-site impacts from many farming activities and extractive industries is required and can be achieved with the help of peak bodies and development of codes of practice: eg, *Broiler Code*.

Pest plant and animal infestation – Ragwort, sweet pittosporum create problems on agricultural land and reserves as does rabbits and foxes which threaten native species.

Waterway degradation – 50% of the waterways are in poor or moderate condition, with many waterways modified to prevent flooding of agricultural and urban land.

Soil degradation – Salinity affects approximately 2000 hectares in the catchment and there is serious gully erosion in the hills and steep coastal areas.

Groundwater use – In some areas, the aquifer is overused and below sea level and has the potential to increase the potential for seawater intrusion.

Land use – Major industries and commercial centres require adequate land for expansion and also protection from inappropriate development. Similarly, the stocks of residential land must be clearly designated and utilised consistent with approved land use plans to enable a diversity of housing opportunities for our future population whilst respecting the environmental and cultural values of the area.

Infrastructure and Resources – Inappropriate development must be avoided, especially where there is the potential to restrict the viable use of the infrastructure and resources, thereby adversely affecting Melbourne's international competitiveness and reputation as the most liveable city.

17. INSTITUTIONAL ASPECTS

17.1 STATE, PROVINCE, REGION OR OTHER ADMINISTRATIVE UNITS

The proposed Biosphere reserve is situated in Australia. Core and buffer zones are under the direct control of the State Government of Victoria, which has a number of agencies responsible for land and marine management and planning in the area. The following local governments are either partly or wholly within the proposed first stage of the Biosphere reserve; Mornington Peninsula Shire Council (wholly in the area), Frankston City Council (partly within the area), Casey City Council (partly within the area), Cardinia Shire Council (partly within the area), Bass Coast Shire Council (partly within the area). French Island is not incorporated within a municipality and is administered for planning purposes by the Department of Infrastructure.

17.2 UNITS OF THE PROPOSED BIOSPHERE RESERVE

The proposal is for a Biosphere reserve comprising adjoining local government areas and French Island, which contains the following core and buffer areas:

- French Island National Park.
- Mornington Peninsula National Park.
- Phillip Island Nature Reserve.
- Quail Island Reserve.
- Langwarrin Flora and Fauna Reserve.
- Numerous other conservation reserves.

17.2.1 Are these units contiguous or are they separate?

➔ *A biosphere reserve made up of several geographically separate units is called a "cluster biosphere reserve". Please state if this is the case of the proposal.*

The Biosphere reserve is a contiguous area and therefore not a cluster Biosphere reserve.

17.3 PROTECTION REGIME OF THE CORE AREA(S) AND, IF APPROPRIATE OF THE BUFFER ZONE(S)

17.3.1 Core area(s)

➔ *Indicate the type (eg, under national legislation) and date since when the legal protection came into being and provide justifying documents (with English or French summary of the main features).*

National Parks Act 1975 (Vic) – applies to the major portion of the core areas and buffer areas, which are permanently reserved and protected. The objects of the Act in respect of national and state parks are to make provision for:

- The preservation and protection of the natural environment.
- The protection and preservation of indigenous flora and fauna, and features of scenic or archaeological, ecological, geological, historic or other scientific interest.
- The study of ecology, geology, botany, zoology and other sciences relating to the conservation of the natural environment.
- The responsible management of the land in accordance with the foregoing for public use for the purposes of enjoyment, recreation or education.


Under the *Parks Victoria Act 1998 (Vic)*, Parks Victoria's responsibilities are to provide services to the state and its agencies for the management of parks, reserves and other public land. With the approval of the Minister, it may also provide land management services to the owner of any other land used for public purposes. The Act requires that, in carrying out its functions, Parks Victoria must not act in a way that is not environmentally sound.

Overall arrangements regarding the relationships and responsibilities for the provision of services to the Department of Natural Resources and Environment (NRE) are set down in a Management Agreement (MA) between Parks Victoria, the Minister for Environment and Conservation and the Secretary to the Department of Natural Resources and Environment. Parks Victoria's management services are delivered within State policy, contractual agreements and the specific responsibilities and powers of the Secretary (NRE) under the *National Parks Act 1975 (Vic)*.

Parks Victoria's responsibilities with regard to the Biosphere reserve include:

- All areas reserved under the *National Parks Act 1975 (Vic)*.
- Nominated Crown land reserved under the *Crown Land (Reserves) Act 1978 (Vic)*.
- Conservation reserves reserved under the *Crown Land (Reserves) Act 1978 (Vic)* and managed in accordance with approved land use recommendations under the *Land Conservation Act 1970 (Vic)*.
- Preparation of the Western Port Ramsar site Strategic Management Plan on behalf of NRE, and direct management of some sites.
- Piers and jetties in Port Phillip Bay and Western Port and recreational boating on these Bays pursuant to powers conferred by the *Marine Act 1988 (Vic)* and the *Port of Melbourne Authority Act 1958 (Vic)*.
- Other areas as specified under the *Parks Victoria Act 1998 (Vic)*.

17.3.2 Buffer zone(s)

 **Indicate the type (eg, under national legislation) and date since when the legal protection came into being and provide justifying documents (with English or French summary of the main features). If the buffer zone does not have legal protection, indicate the regulations that apply for its management.**

The *National Parks Act (1975)* or the *Crown Land (Reserves) Act 1978 (Vic)* apply to the balance of buffer areas including nature conservation reserves, flora and fauna reserves, and bushland reserves. The latter Act allows any Crown lands to be permanently or temporarily reserved for public purposes for any or any combination of public uses including (but not limited to) the following:

- The preservation of areas of ecological significance.
- The conservation of areas of natural interest or beauty or of scientific, historic or archaeological interest.
- The preservation of native plants.
- The protection of the coastline.
- The preservation of wildlife habitat.
- Public parks and gardens.
- Areas for public recreation including areas for camping.

17.4 LAND USE REGULATIONS OR AGREEMENTS APPLICABLE TO THE TRANSITION AREA (IF APPROPRIATE)

Land use and development is regulated under planning schemes prepared and approved under the provisions of the *Planning and Environment Act 1987 (Vic)*. In addition, the Federal Government has legislation such as the *Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)*. This Act also lists significant flora and fauna species, including migratory and marine species. Under the assessment and approval provisions of the *EPBC Act*, actions that are likely to have a significant impact on a matter of national environmental significance are subject to a rigorous assessment and approval process. An action includes a project, development, undertaking, activity, or series of activities.

The Act identifies matters of national environmental significance. Those appropriate to the area include:

- Ramsar wetlands of international significance.
- Listed threatened species and ecological communities.
- Listed migratory species.
- Commonwealth marine areas.

Actions that are likely to have a significant impact on the environment of Commonwealth land (even if taken outside Commonwealth land), and actions taken by the Commonwealth that are likely to have a significant impact on the environment anywhere in the world, may also require approval under the *EPBC Act*.

Each municipality in the transition area administers its own planning schemes. Planning schemes are the principal way of setting out objectives, policies and controls for the use, development and protection of land. Planning schemes must provide for the fair, orderly, economic and sustainable use and development of land.

Planning schemes provide for the protection of natural and man-made resources and the maintenance of ecological processes and genetic diversity through the application of land-use zones and development controls. A sophisticated and long-established system of assessment, review and enforcement operate to ensure that land use and development occur in an orderly and co-ordinated manner.

A number of government agencies, including Melbourne Water, EPA and NRE participate in the land-use decision-making processes under planning schemes as referral authorities. In addition, a number of State Government policies and strategies impact on land use and development by setting criteria and conditions on development approvals.

MANGROVES, WESTERN PORT



Other acts that apply to the control and regulation of land use include:

- *Catchment and Land Protection Act 1994 (Vic)* – includes measures to ensure soil conservation and control of land management practices.
- *Environment Protection Act 1970 (Vic)* – includes provisions to control and manage contamination of land, waste disposal and off site impacts.
- *Local Government Act 1989 (Vic)* – enables municipalities to provide rate incentives for private land owners to encourage the adoption of sustainable land management practices.
- *Wildlife Act 1975 (Vic)* and *Flora and Fauna Guarantee Act 1998 (Vic)* – provide for the protection of fauna and flora species and habitats.
- *Conservation, Forests and Lands Act 1987 (Vic)* – provides a framework for a land administration system and to make the necessary administrative, financial and enforcement provisions.
- *Coastal Management Act 1995 (Vic)* – applies to all coastal Crown land in the region and provides for (among other things) the co-ordinated strategic planning and management of the Victorian Coast, including an approvals approach for use and development of coastal Crown land.
- *Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)* – provides an approvals framework for acts or actions that may impact on sites of national significance.
- *Archaeological and Aboriginal Relics Preservation Act 1972 (Vic)* and *Aboriginal and Torres Strait Islanders Heritage Protection Act 1984 (Cwlth)* – provide a protection framework for Aboriginal archaeological sites.
- *Planning and Environment Act 1987 (Vic)* – provides the framework for planning the use, development and protection of land in Victoria in the present and long-term interests of all Victorians.
- *Australian Heritage Commission Act 1975 (Cwlth)* – provides protection regime for sites listed on the register of the National Estate.
- Additional protection provided through international conventions and agreements, including the *Ramsar Convention on Wetlands*, *CAMBA (China-Australia Migratory Birds Agreement)* and *JAMBA (Japan-Australia Migratory Birds Agreement)*.

17.5 LAND TENURE OF EACH ZONE

➔ Describe and give the relative percentage of ownership in terms of national, state/provincial, local government, private ownership, etc. for each zone.

17.5.1 Core area(s)

100% State Government ownership.

17.5.2 Buffer zone(s)

100% State government ownership. Private land owners may seek to have their properties added to the buffer zone.

17.5.3 Transition area(s)

The transition area is in mixed ownership but predominantly in private ownership under freehold title. The publicly owned portions of the transition area may be land controlled by the Commonwealth; for example, part of Point Nepean, West Head at Flinders (a defence facility) and HMAS Cerberus (a naval base at Hanns Inlet Cribb Point on Western Port). The State Government's Crown land may be reserved for a range of purposes as designated by various Acts of Parliament and includes the state and national parks, various categories of reserves, other lands in institutional use such as schools and the major water bodies. Local governments own land as reserves or in freehold title. The reserves may be used for a range of uses including conservation, recreation or community use. In some cases, local government may act as the committee of management on behalf of the State Government in managing some reserves.

17.5.4 Foreseen changes in land tenure

The processes for acquisition of land for a public purpose and the sale or disposal of land in public ownership are prescribed in legislation. There are no major changes expected in the land tenure of the transition zone. Minor acquisitions and sales occur from time to time but these decisions will not impact on the character or the general arrangement of land tenure in the transition zone into the foreseeable future. Private and indigenous property rights are enshrined in both Commonwealth and State Government legislation and clarified by a body of case law. There are specific “buy back” programs which are under way. These are generally aimed at adding to the public lands to protect the integrity of sensitive areas such as on Phillip Island in the vicinity of the Nature Parks.

17.6 MANAGEMENT PLAN OR POLICY AND MECHANISMS FOR IMPLEMENTATION

➔ *The Seville Strategy recommends promoting the management of each Biosphere reserve essentially as a “pact” between the local community and society as a whole. Management should be open, evolving and adaptive. While the aim is to establish a process leading to elaborating a comprehensive management plan for the whole site reflecting these ideas, this may not yet exist at the time of nomination. In this case, however, it is necessary to indicate the main features of the management policy which is being applied to guide land use.*

The management of the Biosphere reserve is the legal responsibility of the owners of the land. However, the commitment to pursue the sustainability of the natural and cultural values of the area is expected to be greatly enhanced by the creation of a “pact” with the community through the creation of voluntary partnerships and dissemination of information.

17.6.1 Year of start of implementation of management plan or land-use policy

Following successful nomination of the Mornington Peninsula and Western Port Biosphere reserve, it is expected that planning and implementation of Biosphere programs would start immediately (2002).

17.6.2 Main features of management plan or land-use policy and means of application

➔ *For example, through contractual agreements with land owners or resource users, financial incentives, etc.*

The following means of application and implementation are envisaged.

- Creation of voluntary partnerships.
- Encouragement of conservation covenants with private landowners on a voluntary basis.
- Financial incentives (including gifts from charitable institutions).
- Municipal rate relief.
- Establishment of voluntary support groups and networks.

17.7 PERSONNEL

17.7.1 Total number of staff of proposed Biosphere reserve

At present there is one part-time employee working on the Biosphere project. Funding for this position is likely to be ongoing. However, following approval of this proposal, the role of that position is likely to focus more on facilitating projects, community education and liaising with other agencies in identifying opportunities and programs that need to be pursued. The management principles provide for a co-operative approach with agencies and the community, which will ensure additional funding on a project-by-project basis. A Biosphere office will be established as a focus for activities and this is likely to use existing facilities provided by local government.

Future funding requirements will be detailed on a three-year rolling basis, which integrates Biosphere projects with funding opportunities. This approach requires further consultation with each of the local governments involved, potential partners and charitable foundations. It is expected that major contributions will be provided from volunteers. Mornington Peninsula Shire has confirmed its preparedness to underwrite activities of the Biosphere reserve into the future and to liaise with other local governments in securing their support.

17.7.2 Number of staff for administrative and resource management

The part-time Biosphere Project Officer will have access to existing administrative support staff located within local government offices and participating agencies. The objective of this proposal is to generate a partnership between the various agencies and the community, which will avoid creating a bureaucratic structure and duplication of existing activities.

17.7.3 Number of national staff for research

- permanent: 5+
- part-time: 20+

17.7.4 Number of technical support staff

Research staff will be recruited on a project-by-project basis and, in some instances, seconded from existing agencies where necessary to facilitate specific projects. In some cases, the research projects may be carried out by existing employees of agencies in partnership with the Biosphere organisation.

17.8 FINANCIAL SOURCE(S) AND YEARLY BUDGET

The Biosphere project has a current budget for this year of \$40,000, with a similar figure likely next year. Additional funding for specific projects is likely to supplement this sum.

The State Government, through the Department of Infrastructure, has provided a total of \$30,000 over two years. This funding will not be ongoing.

Parks Victoria, a State Government agency, has provided \$22,000.

Phillip Island Nature Park has provided \$15,000.

Mornington Peninsula Shire Council has provided \$10,000, with an ongoing commitment of \$25,000 currently provided in the 2002-03 budget. The Council has for example agreed to underwrite the cost of providing office accommodation and support facilities including resources to ensure regular and required reporting on the Biosphere is provided to the community, members and relevant agencies. The Council will also advocate on behalf of the project for additional funding and support from other Councils and organisations. Funding commitments totaling \$40,000 have already been obtained in addition to logistical support for 2002-03.

17.9 AUTHORITY IN CHARGE OF ADMINISTRATION

The Mornington Peninsula Shire Council to date has accepted responsibility for maintaining records and assisting with the management of the project, this interim arrangement will continue pending formal incorporation of the Biosphere Foundation, at which time there will be an opportunity, if required, for this continued support.

17.9.1 The proposed Biosphere reserve as a whole

The Mornington Peninsula and Western Port Biosphere Reserve Foundation will be an autonomous body. It will provide regular reports on its activities to relevant agencies, members and the community consistent with the management principles and requirements of UNESCO and MAB.

17.9.2 The core area(s)

The core areas are presently owned by the Crown (State Government) and managed by Parks Victoria (a corporation established under State legislation) except for the Phillip Island Nature Park, which is managed by a committee of management.

The Secretary to the Department of Natural Resources and Environment is, subject to the direction and control of the Minister for Conservation and Environment, responsible for the administration of the *National Parks Act 1975* and *Crown Land (Reserves) Act 1978*.

Both the Minister and Secretary delegate to specified Parks Victoria employees the specified powers, functions and duties under both of the above Acts. Parks Victoria and DNRE have responsibility for the administration of statutory regulations made under each of the above Acts.

17.9.3 The buffer zone(s)

As for above, save for the water bodies that are not formally part of the parks. These areas are managed by NRE.

17.9.4 Mechanisms of consultation and co-ordination among these different authorities

➔ *For example, through consultative meetings, the designation of a special co-ordinator or facilitator to maintain contacts with all stakeholders and actors.*

At present, the Biosphere reserve is championed by a core group of representatives from local, State and Federal Government bodies, community representatives, educationalists and other agencies.

17.10 LOCAL ORGANISATIONAL ARRANGEMENTS

The idea to pursue the Mornington Peninsula and Western Port Biosphere reserve was generated by community members living on the Mornington Peninsula and on Phillip Island. Milestones of the project include the initial recommendation for a Biosphere reserve in the French Island National Park Management Plan in 1998. Recommendations for a Biosphere reserve in the area were also made in 2000 by the Environment Conservation Council Marine Coastal and Estuarine Investigation and in the Phillip Island Nature Park Management Plan (2000).

In June 1999, a meeting was convened by community members, and the Biosphere Advisory Group was formed. This committee includes community members and representatives of local and State government, park managers and RMIT University, and has been meeting on a regular basis to further the proposal. The most significant aspect of the work of the committee has been the development and implementation of a communication plan in conjunction with the preparation of this application.

Community consultation has included workshops, the development of a brochure (see attached) community meetings, speaking engagements with community groups, presentations, information days, forums, briefings, articles in local and statewide media, etc.

17.10.1 Extent to which local communities have been associated with the nomination process

The interest and involvement of local communities has been a crucial component of this nomination process. Over the past two years, there has been a series of articles published, circulation of a brochure (see copy attached), a public forum, focus group meeting, and meetings with many interested community groups and individuals.

Briefings:

Australian Landscape Trust	McLeod Eco Farm, French Island	Port of Hastings – Department of Infrastructure
Balcombe Estuary Rehabilitation Group	Melbourne Water	Port Phillip Conservation Council
BHP	Monash University	Primary Skills Victoria
Cardinia Shire	Monsanto	Royal Society
Chisholm Institute of TAFE	Mornington Peninsula Bed & Breakfast Association	Skills Share – Hastings
City of Casey	Mornington Peninsula Community Connections	South East Water
Clean Ocean Foundation	Mornington Peninsula Sustainable Business group	Southern Peninsula Indigenous Flora and Fauna Association
Crib Point Residents Association	Mornington Peninsula Vignerons Association	Toll Holdings
Deakin University	Mt Eliza Association for Environmental Care	Victorian Farmers Federation
Don Hodgins Industries Pty Ltd	Mt Eliza Business School	Victorian National Parks Association
EarthWatch Institute	Mt Eliza Secondary College	Warringine Park Committee
Environment Protection Authority	Peninsula Bird Observers Club	Western Port and Peninsula Protection Council
Esso	Peninsula Tourism	Western Port Bird Observers Club
French Island Community Association	Phillip Island Conservation Society	Western Port Catchment Implementation Committee
Friends of French Island	Phillip Island Landcare Group	Western Port Seagrass Partnership
Friends of the Koala	Phillip Island Nature Park Board	Western Port Water Board
Global Sustainability at RMIT	Port of Hastings	Williamson Foundation
Hastings Lions Club		Work Placement
Hastings Port Holdings Corporation		
Heronwood		
Insite Consultants Pty Ltd		
Marcus Kalkman & Associates		

Project Milestones:

1998	French Island Management Plan recommendation
June 1999	Local community meeting and Biosphere Advisory Group formed
March 2000	Acceptance of proposal by Australian Commission to UNESCO
August 2000	ECC Marine Coastal & Estuarine Investigation Final Report recommendation
December 2000	Phillip Island Nature Park Management Plan recommendation
June 2001	Brochure developed
August 2001	Project officer appointed
November 2001	UNESCO application progressed

Founding partners:

Mornington Peninsula Shire
Department of Infrastructure
Parks Victoria

RMIT University
Phillip Island Nature Park

Biosphere Advisory Group additional participants:

Bass Coast Shire
Community representatives
Frankston Mornington Peninsula Local Learning and
Employment Network
Port Phillip Catchment and Land Protection Board
Kulin Nations

Inter-Council Aboriginal Consultative Committee
South East Water
Environs Australia
Central Coastal Board
Mornington Environment Association

The following people were regular participants in the Biosphere Advisory Group meetings, or provided invaluable assistance to the group.

Richard Armstrong	Ian Haskins	Barbara Porter
Alex Atkins	Jane Hildebrandt	Brad Roberts
Stella Axarlis	Justin Johnson	Sophia Schyschow
Bob Band	Michael Kennedy	Nigel Sharp
Mark Batty	Jim Kerin	Paul Smith
Bob Brinkman	Phil King	Peter Smith
David Buntine	Jack Krohn	Malcolm Spittle
Dean Burman	Ras Lawson	Ian Stevenson
Rob Cheetham	Kim Lowell	Lynton Shedden
Alan Cole	Ray Leivers	Harry Terrick
Mary Cole	Sharon Makin	Robyn Thomas
Brian Cuming	Neil McCarthy	Jillian Verdhart
Peter Dann	Ian Morris	Glenys Watts
Craig Forster	Jim Muldoon	Ian Weir
Jon Furey	Warwick Newall	Cecilia Witton
Kate Glenie	Pat O'Connell	Peter Woodgate
Elery Hamilton Smith	Bryan Patterson	Kevin Yorke
Margaret Hancock	Ann Penaluna	Jeff Yugovic

Community Consultation:

Mailout to more than 200 community groups

Newspaper articles:

<i>The Age</i>	3 November 1999
<i>The Age</i>	8 July 2001
<i>South Gippsland Sentinel Times</i>	25 September 2001
<i>Phillip Island and San Remo Advertiser</i>	26 September 2001
<i>Frankston Hastings Independent</i>	16 October 2001
<i>Frankston Hastings Independent</i>	23 October 2001

March 2001	Sustainable Peninsula Forum – 400 participants
31 May 2001	Biosphere Focus group
19 July 2001	Sustainable Peninsula – Tourism Forum
21 July 2001	French Island Residents Association briefing
15 August 2001	Phillip Island environmental groups briefing
29 September 2001	Bass Coast Shire – Information day
29 October 2001	Mailout to over 200 community groups
7/8 November 2001	Mornington Peninsula Shire – Information sessions
16/17 November 2001	Sustainable Living Fair

This ongoing program has also involved discussion with government agencies, members of parliament and representatives of other Biosphere reserves, such as Bookmark in South Australia. The proposal as outlined in this document was the subject of public comment and was circulated to interested individuals and groups for comment and input. Twenty submissions were received. No opposition to the nomination proceeding was expressed, but many improvements were suggested. These have been taken into account in the preparation of this document.

17.10.2 Local communities participation in formulation and implementation of the management plan or land use policy

The general community will be directly involved in the development of the organising body consistent with the principles described and in the ongoing management of the Biosphere Foundation, and in addition have the opportunity to participate in management plans for the core and buffer areas together with the projects and programs sponsored by the Biosphere Foundation. A large number of letters of interest and support have been received from a diverse range of groups, including universities, community groups, industry and government agencies.

Conservation groups in the Biosphere include:

Archies Creek Reafforestation Group	Friends of Fairbairn Reserve	Friends of Sorrento Ocean Beach
Arthurs Seat State Park Weeding Group	Friends of Greens Road Bushland Road Reserve	Friends of Spray Point Road
Back Creek Landcare Group	Friends of Hopetoun Reserve	Friends of the Cranbourne Royal Botanic Gardens
Balcombe Estuary Rehabilitation Group	Friends of Koala Reserve	Friends of the Fort (Point Nepean)
Bass Park Trust Flinders	Friends of Lorikeet Bushland Reserve	Friends of the Pines Bushland
Bass Valley & District Conservation Society	Friends of Moorooduc Quarry Flora and Fauna Reserve	Friends of the Quarantine Museum
Bass Valley Landcare Group	Friends of Mt Martha Park	Friends of the Tootgarook Wetlands
Bittern Bushland Preservation Association	Friends of Peninsula Gardens	Friends of Tindals Wildflower Reserve
Blind Bight Coast Action	Friends of Red Hill South Reserve	Friends of Wilson Botanic Park
Blue Gum Weed Group	Friends of Seaford Foreshore	Friends of Wright Forest
Boneseed Volunteers/ Boneseed Care Group	Friends of Slips Reserve	Friends of Yaringa
Boonerwung Wetlands	Friends of Somerville Bushland Reserve	Harbury Reserve Committee
Briars Homestead	Friends of Upper Sweetwater	Harkaway Foothills Landcare Group
Bunyip Landcare Group	Friends of Warringine Park	Hills Ragwort Group
Cannibal Creek Landcare Group	Friends of Arthur's Seat State Park	Jeetho West Landcare Protection Group
Cannon's Creek Coast Action Group	Friends of Bass Valley Bush Inc	Kananook Creek Association
Capel Sound Foreshore Reserve	Friends of Betty Clift Conservation Reserve	Labertouche Landcare Group
Cardinia Environment Coalition	Friends of Buxton Woodlands Reserve	Land For Wildlife
Cardinia Hills Ragwort & Landcare Group	Friends of Cardinia Creek Sanctuary	Lang Lang Coast Action Group
Collins Settlement Historic Site Friends Group	Friends of Chambers Reserve	Lang Lang, Koo Wee Rup & District Landcare Group
Coolart Reserve	Friends of Colley Street Bushland Reserve	Langwarrin Bush And Parkland Group
Coolart/Merricks Creek Catchment Coalition	Friends of Collins Settlement Historic Site	McCrae Homestead Coastal Group
Dunns Creek Landcare Group	Friends of Coolart	Mclear Road Weedbusters
Frankston Beach Assoc and Action Sweetwater Creek	Friends of Devil Bend Reservoir Park	Merricks Coolart Catchment Group (Hanns Creek Reserve)
French Island Landcare Association	Friends of Diamond Bay	Mornington Environment Association
Friends of Banool Reserve	Friends of French Island National Park	Mount Eliza Association for Environmental Care
Friends of Belvedere Bushland Reserve	Friends of HMAS Cerebus	Mount Eliza Coast Care
Friends of Bill Carroll Reserve	Friends of Hooded Plover	Mount Martha Environmental Group
Friends of Bracken Ridge Reserve	Friends of Kangerong Flora Reserve	Mount Martha Field Naturalists Club
Friends of Camerons Bight	Friends of Langwarrin Flora & Fauna Reserve	Mt Lyall Landcare Group
Friends of Central Sweetwater	Friends of Local Koalas and Wildlife	Nepean Conservation Group Inc
Friends of Cook Street Bushland Reserve	Friends of Mornington Peninsula National Park	Ocean Beach Road Conservation Group
Friends of Dimmicks Bushland Reserve	Friends of Point Nepean	Pakenham Farm Tree Group
Friends of Dorothea Bushland Reserve	Friends of Rosebud Beach	Park Community Association Inc
Friends of Earimil Creek Reserve	Friends of Rye Ocean Beach	
Friends of Edithvale Seaford Wetlands	Friends of Sid Baker Reserve	
Friends of EG Ritchie Memorial Flora Reserve		

Conservation groups in the Biosphere (continued)

Peninsula Bird Observers Club	Poowong Landcare	Sutherland Park Committee
Peninsula Branch Land Care Group Inc V.F.F.	Red Hill South Community Reserve	Tooradin Coast Action
Peninsula Environment Council	Salisbury Gully Working Committee	Tootgarook Wetlands
Peninsula Field Naturalists Club	Seawinds Nursery Volunteers	Triholme Landcare Group
Peninsula Society for Growing Australian Plants	Sorrento-Portsea-Blairgowrie Conservation Group	West of Warragul Women on Farms
Perserverance Primary School Young Landcare Group	Southern Peninsula Indigenous Flora and Fauna Association	Western Port and Peninsula Coastal Watch Association
Phillip Island Landcare & Junior Landcare Groups	Southern Peninsula Tree Preservation Society	Western Port Bird Observers Club
Point Leo Coast Action Group	St Andrews Beach Preservation Society	Western Port Phillip Coastal Watch Association
Poowong & District Landcare Group	Sunshine Reserve Conservation and Fire Guard Group	Westernport and Peninsula Protection Council
		Whistle Stop Natural Reserve
		Wildlife Help on the Mornington Peninsula

18. SPECIAL DESIGNATIONS:

➔ *Special designations recognise the importance of particular sites in carrying out the functions important in a Biosphere reserve, such as conservation, monitoring, experimental research, and environmental education. These designations can help strengthen these functions where they exist or provide opportunities for developing them. Special designations may apply to an entire proposed Biosphere reserve or to a site included within. They are, therefore, complementary and reinforcing of the designation as a Biosphere reserve. Check each designation that applies to the proposed Biosphere reserve and indicate its name.*

Name:

(No) UNESCO World Heritage Site

(Yes) Ramsar Wetland Convention Site

(Yes) Other international conservation conventions/directives

Native Title

Forest Management Agreement

(Please specify).

(Yes) Long-term monitoring site [Please specify]

Creation of reference areas under Government legislation

() Other. [Please specify]

19. SUPPORTING DOCUMENTS

➔ **A GENERAL LOCATION MAP of small or medium scale must be provided showing the location of the proposed Biosphere reserve and all included administrative areas, within the country, and its position with respect to major rivers, mountain ranges, principal towns, etc. Large scale, preferably in black & white for photocopy reproduction.**

General location map: Map 1

A BIOSPHERE RESERVE ZONATION MAP of a larger scale [1:25,000 or 1:50,000] showing the delimitations of all core area(s) and buffer zone(s) must be provided. The approximate extent of the transition area(s) should be shown, if possible. While large scale and large format maps in colour are advisable for reference purposes, it is recommended to also enclose a Biosphere reserve zonation map in a A-4 writing paper format in black & white for easy photocopy reproduction.

Biosphere Reserve zonation map: Map 2. See also 4 attached maps – scale 1:5000

A VEGETATION MAP or LAND COVER MAP showing the principal habitats and land cover types of the proposed Biosphere Reserve should be provided, if available.

Vegetation map or land cover map: Map 3. See Map 3 and attached map – scale 1:100,000.

LIST OF LEGAL DOCUMENTS

If possible with English or French translation. List the principal LEGAL DOCUMENTS authorising the establishment and governing use and management of the proposed Biosphere reserve and any administrative area(s) they contain. Please provide a copy of these documents, if possible with English or French translation. See earlier text in this nomination.

Aboriginal and Torres Strait Islanders Heritage Protection Act 1984 (Cwlth)
 Archaeological and Aboriginal Relics Preservation Act 1972 (Vic)
 Australian Heritage Commission Act 1975 (Cwlth)
 Coastal Management Act 1995 (Vic)
 Conservation, Forests and Lands Act 1987 (Vic)
 Crown Land (Reserves) Act 1978 (Vic)
 Environment Protection Act 1970 (Vic)
 Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)
 Flora and Fauna Guarantee Act 1998 (Vic)
 Land Conservation Act 1970 (Vic)
 Local Government Act 1989 (Vic)
 Marine Act, 1988 (Vic)
 National Parks Act 1975 (Vic)
 Parks Victoria Act 1998 (Vic)
 Planning and Environment Act 1987(Vic)
 Port of Melbourne Authority Act 1958 (Vic)
 State Environment Protection Policy (Waters of Victoria): Schedule F8 Western Port and catchment. No.S192 Gazette 2/11/2001
 State Environment Protection Policy (Waters of Victoria): Schedule F8 Western Port and catchment. No.S192 Gazette 2/11/2001
 Wildlife Act 1975 (Vic)

Copies of these documents in English are available at the following websites:

Victorian Hansard (for State legislation), online at <http://www.parliament.vic.gov.au/hans.html>

Australian Hansard (for Commonwealth legislation), online at <http://www.aph.gov.au/hansard/index.htm>

List existing LAND USE and MANAGEMENT PLANS [with dates and reference numbers] for the administrative area(s) included within the proposed Biosphere Reserve. Provide a copy of these documents.

- French Island National Parks Management Plan, online at http://www.parkweb.vic.gov.au/resources/07_0169.pdf
- Mornington Peninsula National Park and Arthurs Seat State Park Management Plan, online at http://www.parkweb.vic.gov.au/resources/07_0179.pdf
- Phillip Island Nature Park Management Plan
- Coolart Wetlands and Homestead Reserve Future Directions Plan, online at http://www.parkweb.vic.gov.au/resources/09_0144.pdf
- Warringine Park Management Plan

Provide a LIST OF IMPORTANT SPECIES [threatened species as well as economically important species] occurring within the proposed Biosphere reserve, including common names, wherever possible).

See appendices.

Provide a list of the main publications and articles of relevance to the proposed biosphere reserve over the past 5-10 years.

See appendices.

PHILLIP ISLAND NATURE PARK



20. ADDRESSES

20.1 CONTACT ADDRESS OF THE PROPOSED BIOSPHERE RESERVE

➔ *Government agency, organisation, or other entity (entities) to serve as the main contact to whom all correspondence within the World Network of Biosphere Reserves should be addressed.*

Name: Ian Morris
Director of Sustainability
Mornington Peninsula Shire Council
Street or P.O. Box: Private Bag 1000
City with postal code: Rosebud Victoria 3939
Country: Australia
Telephone: 61 03 5986 0231
Telefax (or telex): 61 03 5986-0272
E-mail: morria@mornpen.vic.gov.au

20.2 ADMINISTERING ENTITY OF THE CORE AREA

Name: Bob Brinkman
Chief Ranger
Mornington Peninsula Western Port
Parks Victoria
Street or P.O. Box: PO Box 400
City with postal code: Rosebud Victoria 3939
Country: Australia
Telephone: 61 03 5986 8987
Telefax (or telex): 61 03 5981 2823
E-mail: bbrinkma@parks.vic.gov.au

20.3 ADMINISTERING ENTITY OF THE BUFFER ZONE

Name: Bob Brinkman
Chief Ranger
Mornington Peninsula Western Port
Parks Victoria
Street or P.O. Box: PO Box 400
City with postal code: Rosebud Victoria 3939
Country: Australia
Telephone: 61 03 5986 8987
Telefax (or telex): 61 03 5981 2823
E-mail: bbrinkma@parks.vic.gov.au

Letters of endorsement

From Environment Australia



Mr Ian Morris
 Mornington Peninsula Shire Council
 Private Bag 1000
 ROSEBUD VIC 3939

Dear Mr Morris

Mornington Peninsula and Western Port Biosphere Reserve (Stage 1) Nomination

I refer to the draft Stage 1 nomination dated May 2002, which was recently released for public comment.

As Environment Australia provides the focal point for the biosphere reserve program in Australia, I am particularly pleased to receive your draft nomination to establish the first new biosphere reserve in Australia for some time. The role of the focal point includes *inter alia*, to provide comment and endorsement (in accordance with UNESCO guidelines) of new biosphere reserve proposals.

I therefore endorse the proposal on behalf of Environment Australia and wish you every success with the submission to UNESCO, which I understand you will be sending direct to the MAB Secretariat given the closing date for submissions of 31 May 2002.


 Peter Cochrane
 Director of National Parks

30 April 2002



From Mornington Peninsula Shire Council



**MORNINGTON
PENINSULA**

Shire

ABN 53 159 890 143

Private Bag 1000
Besgrove Street
Rosebud 3939

Tel (03) 5986 0200
Fax (03) 5986 6696
DX 30059

16 November 2001

Ms Kate Glenie
Project Manager
Mornington Peninsula & Western Port Biosphere
c/- Private Bag 1000
ROSEBUD 3939

Dear Kate

I have pleasure in confirming Mornington Peninsula Shire Council's support for the Mornington Peninsula and Western Port Biosphere Project.

The following Council resolution clearly indicates the project has strong community support and I look forward to Council continuing to have a lead role in this project.

"THAT THE CHIEF EXECUTIVE OFFICER BE AUTHORISED TO WRITE TO RELEVANT AGENCIES AND THE BIOSPHERE COMMITTEE CONFIRMING THE COUNCIL'S SUPPORT FOR THE MORNINGTON PENINSULA AND WESTERN PORT BIOSPHERE PROPOSAL. "

I understand you are continuing to liaise with relevant community groups and Government agencies and I will also ensure my colleagues at our neighbouring Councils are informed of the importance of this project in promoting sustainability in this region.

Yours sincerely

Michael Kennedy
CHIEF EXECUTIVE OFFICER

From Bass Coast Shire Council

Doc ID 434845 Printed from AusInfo EDMS at : 10:54AM on Wed 15 May 2002

Contact: Paul Smith
 Document Ref: /:/groups/planning_environment/au/2002/bio/029-kr.doc
 File No: 18-08-0034
 Doc Ref: 0200421
 21 March, 2002



Attention: Kate Glenie - Project Officer
 C/- Ian Morris
 Mornington Peninsula Shire
 Private Bag 1000
 ROSEBUD VIC 3939

MORNINGTON PENINSULA SHIRE COUNCIL	
RECEIVED	27 MAR 2002
MAIL TO	0530/010/060/00
OFFICIAL USE	I. MORRIS

Dear Ms Glenie

BASS COAST SHIRE COUNCIL'S SUPPORT FOR THE MORNINGTON PENINSULA AND WESTERN PORT BIOSPHERE PROJECT

I advise that Council considered the proposed Mornington Peninsula and Western Port Biosphere Project at its meeting on the 6 March 2002 and resolved:

"That Council write to the Biosphere Advisory Group giving support for the UNESCO application for the setting up of the Mornington Peninsula and Western Port Biosphere Project."

Council recognises that the Western Port region, which has been proposed as the Biosphere reserve, has outstanding environmental, recreational, agricultural and tourism values.

Western Port is one of the State's most used marine areas for commercial and recreational purposes and is also an area of great biological significance. The area features outstanding landscapes and sustains some of the State's most valuable farming land. The immediate catchment of Western Port around the eastern shores and on the north shore of Phillip Island are important in relation to agriculture, tourism and recreation but also have significant environmental values because of areas of mangrove and mudflats for migratory birds.

Council's recommendation supports the proposed reserve and looks forward to UNESCO approving the Group's application.

If you wish to discuss this matter, please contact me at your convenience.

Yours faithfully

Allan Bawden
 CHIEF EXECUTIVE OFFICER

76 McBride Avenue (PO Box 118) Wonthaggi Vic 3965 - DX 34903 Wonthaggi
 Tel: (03) 5671 2211 or (03) 5651 3311 - Fax: (03) 5671 2222
 TTY: (03) 5671 2256 or (03) 5951 3356
 Email: basscoast@basscoast.vic.gov.au - Website: www.basscoast.vic.gov.au

From the City of Casey

Doc ID 442115 Printed from AusInfo EDMS at : 10:54AM on Wed 15 May 2002



71-35/946
IS/MR

12 April 2002

Dr Michael Kennedy
Chief Executive Officer
Mornington Peninsula Shire Council
DX 30059
ROSEBUD

Dear Michael

Mornington Peninsula & Western Port Biosphere Proposal

I refer to your letter dated 14 January 2002 regarding the City of Casey's support for the above proposal.

Subsequent to this correspondence, Council officers and Cr Mantel met with representatives of the Biosphere Advisory Group to discuss Casey's concerns regarding possible statutory land use controls as a result of UNESCO nomination.

Reassurances were provided that nomination is not linked to such legal controls. As a result of this, Council considered a further report on 19 March 2002 and resolved to support in principle, the area of coastal land abutting Western Port, defined in the Planning Scheme as 'The Bay Region', forming part of the Western Port Biosphere Reserve. Council also resolved to support the nomination of the Western Port Biosphere Reserve to UNESCO in 2002.

Council's decision was informally conveyed to Ms Kate Glennie, Biosphere Project Officer, prior to the Biosphere Group's March meeting. Please now consider this as the formal position of the City of Casey in preparing future support documentation for nomination time lines.

Should you have any queries regarding this matter, please do not hesitate to telephone Council's Team Leader Environmental Services, Ian Stevenson, on 9705 5588.

Yours sincerely

Mike Tyler
Chief Executive Officer

MORNINGTON PENINSULA Shire Council	
RECEIVED	16 APR 2002
SEARCH TITLE	0530/000/000/000
OFFICER	I. Morris
FILE	0510/070

Princes Highway
PO Box 1000
Narre Warren 3805
Telephone 03 9705 5300
Facsimile 03 9704 9544
Austdoc DX 30460 Berwick
Email caseycc@casey.vic.gov.au
Website www.casey.vic.gov.au
ABN 43 320 295 742

From Frankston City Council

Doc ID 446100 Printed from AusInfo EDMS at : 10:53AM on Wed 15 May 2002

Reference: 12/1/346
Enquiries: Mark Batty
9784 1009

MORNINGTON PENINSULA & WESTERN PORT SHIRE COUNCIL	
DATE	24 APR 2002
BY	0530 / 010 / 060
TO	M. Kennedy



17 April, 2002

Dr Michael Kennedy
Chief Executive Officer
Mornington Peninsula Shire Council
Private Bag 1000
ROSEBUD 3939

Dear Michael

Re: ENDORSEMENT OF MORNINGTON PENINSULA & WESTERN PORT BIOSPHERE PROPOSAL

Following a presentation by Mr Ian Weir of the Mornington Peninsula & Western Port Biosphere Proposal Reference Group to Council, Frankston City is delighted to support the Reference Group in its desire to establish the Mornington Peninsula & Western Port Biosphere. Such initiatives are fundamental to developing and maintaining the partnership approach required for a sustainable future, and the Reference Group is to be commended for its foresight and dedication in striving for this most essential goal.

Moreover, this Council has accepted the invitation of the Reference Group for those parts of Frankston City that are within the Western Port Catchment to be included in the nominated area of Stage One.

Frankston City looks forward to working with the other members of the Reference Group in the development of a formal nomination for submission to UNESCO, and in the further development of the Mornington Peninsula & Western Port Biosphere Proposal.

Yours Sincerely



Jon Edwards
CHIEF EXECUTIVE OFFICER

E:\MornWestPort Biosphere\kenedy letter.doc

Civic Centre Davey Street Frankston Victoria Australia 3199 Telephone (03) 9784 1888 TTY (03) 9784 1951 Facsimile (03) 9781 3117

All Correspondence to Chief Executive Officer PO Box 490 Frankston Victoria 3199 DX 19913 Frankston

From Cardinia Shire Council

Doc ID 448888 Printed from AusInfo EDMS at : 10:53AM on Wed 15 May 2002

22-APR-2002 MON 12:19

GENERAL MGRS OFFICE

FAX NO. 03 5945 4209

P. 02

Our Ref: 6164/01/0
Your Ref:

22 April 2002

Mr Ian Morris
Director - Sustainable Development
Mornington Shire Council
Private Bag 1000
ROSEBUD VIC 3939



Dear Mr Morris

Re: Proposed Biosphere Environment Project

I refer to our recent discussions regarding the proposed Biosphere Environment Project.

I am pleased to confirm that Cardinia Shire Council supports the proposed Biosphere Environment Project for the Westernport Region. Cardinia Shire Council is highly committed to the effective management of the landscapes, waterways and remnant native vegetation in our municipality.

Council is also keen to ensure that new urban development in the Beaconsfield-Pakenham growth corridor is environmentally sustainable and does not diminish the beauty and quality of the local natural environment.

Council is pleased to support this exciting initiative.

Yours faithfully

Geoff Rundell
General Manager Community Planning

c:\staff\jacob\geoff\letters\22apr\mccr02.doc

Cardinia Shire Council
PO Box 100 Rosebud
Municipal Office
Newey Way
Rosebud

PO Box 7
Pakenham 3910
(03) 81006

Tel (03) 5945 4222
Fax (03) 5941 3794
Email mail@cardinia.vic.gov.au
Website www.cardinia.vic.gov.au

From the Victorian Minister for Environment and Conservation, the Hon. Sherryl Garbutt, MP (page one)

26-JUN-2002 12:31 FROM: MORNINGTON PENINSULA 59868272

TO: 096190909

P: 3/4

26/06/2002

12:06

MICHONNE UAN REES + 59868272

NO. 296 002



Minister for Environment and Conservation

8 Nicholson Street
PO Box 500
East Melbourne Victoria 3002
Telephone: (03) 9637 8900
Facsimile: (03) 9637 8930
AUN 90 719 642 204
BX 210099

Mr Ian Morris
Director - Planning and Environment
Mornington Peninsula Shire
Queen Street
MORNINGTON VIC 3931

Dear Mr Morris

MORNINGTON PENINSULA AND WESTERN PORT BIOSPHERE RESERVE

Thank you for your submission to the Victorian Government regarding the Mornington Peninsula and Western Port Biosphere Reserve. On behalf of the Victorian Government, I am pleased to inform you that the Government endorses the nomination, subject to the conditions set out below being met.

As you are aware, the Victorian State Government endorsed its policy on Biosphere Reserves in April of this year. That policy supported the biosphere reserve concept and set out a number of criteria against which specific proposals would be assessed.

This is the first biosphere proposal of this sort in Victoria. It will therefore establish the benchmark for any future biosphere proposals that may be developed in this State. The Government is therefore concerned to ensure that the proposal is of a high standard and the Reserve is established in a way that maximises the chance of success.

The Victorian Government has therefore determined to endorse your proposal for submission to UNESCO subject to the following conditions being met:

- Development of arrangements for the proposed administrative structure to the satisfaction of the Minister for Environment and Conservation;
- A more detailed statement of the proposed arrangements for handling donations, grants/financial arrangements be provided to the satisfaction of the Minister for Environment and Conservation;
- By 30 September 2002, the Biosphere Advisory Committee provides evidence to the Minister for Environment and Conservation of guaranteed funding of at least \$80,000 for both 2002/2003 and 2003/2004;
- No State Government funding (including Parks Victoria) will be provided for the costs associated with the establishment and ongoing administrative operation of the Foundation and its programs, apart from that available through normal grant programs;



For further information about NRE contact the Customer Service Centre on 136 186 or visit our website at www.nrc.vic.gov.au

From the Victorian Minister for Environment and Conservation, the Hon. Sherryl Garbutt, MP (page two)

26-JUN-2002 12:31 FROM: MORNINGTON PENINSULA 59868272

TO: 096198989

P: 4/4

- That direct consultation with key industrial stakeholders be undertaken to the satisfaction of the Minister for Environment and Conservation by 31 August 2002;
- That the proposed Mornington Peninsula and Western Port Biosphere Reserve Foundation cooperate with the State Government in monitoring the effectiveness of the proposed biosphere reserve in its first 18 months of operation and at 2 yearly intervals thereafter using performance indicators provided by the Minister for Environment and Conservation;
- That local and Commonwealth governments give an undertaking that Biosphere Reserve designation will not lead to State planning and environmental approval processes being over-ridden or constrained now or in the future;
- That the boundaries and zones of the proposed area are subject to revision following the finalisation of the Government's Metropolitan Strategy; and
- Support for Stage 1 does not imply support for any future expansion of the biosphere reserve, which will be conditional on the demonstrated success of Stage 1 and separately assessed against the criteria in the State Government's policy.

Your Biosphere Proposal is an exciting development and I am confident that the conditions set out above will increase the chance of its ongoing success. Nevertheless, following discussions with UNESCO, the State reserves the right to have the nomination withdrawn prior to UNESCO's final consideration in November in the event that the conditions are not met. Michonne van Roon from my Department will contact you to agree on a process for meeting these conditions.

I wish you every success as this nomination now proceeds to UNESCO.

Yours sincerely



Sherryl Garbutt MP
Minister for Environment and Conservation

26/6/2002

From the Australian National Commission for UNESCO



AUSTRALIAN NATIONAL COMMISSION FOR UNESCO

International Organisations Branch
Department of Foreign Affairs and Trade

R. G. Casey Building
John McEwen Cres
Barton ACT 0221
Australia

Telephones:
National: (02) 6261 2289/2037
International: 612 6261 2289/2037
Facsimile: (02) 6261 2272
e-mail: ian.c.anderson@dfat.gov.au
Homepage: <http://www.dfat.gov.au/intorgs/unesco>

92/010729

23 March 2000

Mr Ian Weir
33 Larch Cres
Mt Waverley Vic 3149

Dear Mr Weir,

I refer to the proposal for a UNESCO biosphere reserve in Victoria encompassing Western Port and its catchment including Phillip and French Islands, the Mornington Peninsula and part of Port Phillip Bay. You submitted the proposal to the National Commission for consideration.

The proposal was considered by the science network of the National Commission at its meeting on 11 March and by the National Commission which met on 12 March.

I am pleased to advise that the National Commission found the concept outlined in your proposal acceptable as a biosphere reserve. The Commission supported the development of a formal nomination for submission to UNESCO in Paris.

Yours sincerely

A handwritten signature in black ink, appearing to be "Ken Wiltshire".

Professor Ken Wiltshire AO
Chairman

REFERENCES

- ABS (1996).** *Australian Bureau of Statistics: Census of population and housing.* ABS, Canberra. On line at <http://www.abs.gov.au>.
- Andrew, D.L., Lumsden, L.F & Dixon, J.M.(1984).** *Sites of zoological significance in the Westernport region.* ESS no.327, Department of Conservation Forests & Lands, Victoria.
- ANZECC (1995).** *Maritime accidents and pollution: impacts on the marine environment from shipping operations - paper for public comment , March 1995.* Australian and New Zealand Environment and Conservation Council, Environment Australia, Canberra.
- ANZECC (1999).** *Strategic plan of action for the national representative system of marine protected areas: A guide for action by Australian governments.* Australian and New Zealand Environment and Conservation Council, Environment Australia, Canberra.
- AHC (2002).** *Australian Heritage Commission: Register of the National Estate database.* Online at <http://www.ahc.gov.au>.
- Barwick, D.E. (1984).** *Mapping the past: an atlas of Aboriginal clans.* *Aboriginal History* 8(2): 100 - 131.
- Bird, E.C.F. (1993).** *The Coast of Victoria: The shaping of scenery.* Melbourne University Press, Carlton, Victoria.
- Boura, J. (1994).** *Fire and biodiversity: The effects and effectiveness of fire management.* Victorian National Parks Association, Victoria.
- Briggs, J.D. & Leigh, J.H. (1996).** *Rare or threatened Australian plants.* CSIRO & Australian Nature Conservation Agency, Canberra.
- Broiler Code (2001).** *Victorian code for broiler farms: September 2001.* Department of Natural Resources & Environment, Victoria.
- Calder, W. (1986).** *Peninsula perspectives: Vegetation on the Mornington Peninsula, Victoria.* Jimaringle Publications: Canterbury, Victoria.
- Cannon, M. (1993).** *Black land, white land.* Minerva-Reed Books Australia: Melbourne.
- Cannon, M. (ed.). (1983).** *Historical records of Victoria, vols. 2A & 2B. The Aborigines of Port Phillip 1835 - 1839.* Foundation Series, Victorian Government Printing Office: Melbourne.
- Carroll, P. (2001).** Summary of issues from public meeting: 'Grape growing and the community' held at Red Hill Consolidated School, Red Hill , February 2001.
- Central Coastal Board (in press).** *Western Port bibliography.* Central Coastal Board, Department of Natural Resources & Environment, Victoria.
- Champion, R. (1974).** *Westernport region conservation survey: A report to the Westernport Region Planning Authority.* Conservation Council of Victoria, Melbourne, Victoria.
- Commonwealth (1993).** *Biodiversity and its value: Biodiversity series, paper no. 1.* Biodiversity Unit; Department of the Environment, Sport and Territories; Commonwealth of Australia.
- Commonwealth Bureau of Meteorology (2002).** Online at <http://www.bom.gov.au>.
- Condina, P. & Craigie, N.M. (1998).** *Mornington Peninsula drainage area - Due diligence investigation.* Report for Melbourne Water & Mornington Peninsula Shire Council, Victoria.
- Cotter, R. (2001).** *Boon Wurrung: People of the Port Phillip district.* Lavender Hill Multimedia, Red Hill Sth., Victoria.
- Coveny, J. (1990).** *Report on the threats to national parks originating outside their boundaries.* Footscray Institute of Technology, Melbourne.
- CSIRO (1996).** *Port Phillip Bay environmental study: Final report, June 1996.* Commonwealth Scientific & Industrial Research Organisation, Melbourne.
- DOI (2002).** *Planning schemes for local government areas of Bass Coast, Casey, Cardinia, Frankston, & Mornington Peninsula.* Department of Infrastructure, Victoria. Online at <http://www.doi.vic.gov.au>.
- ECC (2000).** *Marine and estuarine investigation: Final report.* Environment Conservation Council, Victoria. Online at <http://www.nre.vic.gov.au/ecc/marinereport2000.htm>.

- EPA. (1995). *The Distribution of seagrass in Western Port, Victoria*. Publication 490, Environment Protection Authority, Victoria.
- EPA. (1997). *Western Port 'Action +' program*. Publication 582, Environment Protection Authority, Victoria.
- EPA. (2000). *Protecting the waters of Western Port and catchment: A summary of the Western Port and its catchment schedule (F8) to State Environment Protection Policy (Waters of Victoria)*. Publication 706, Environment Protection Authority, Victoria.
- EPA (2001). *State Environment Policy (Waters of Victoria) Schedule F8 (Waters of Western Port and catchment)*. Environment Protection Authority, Victoria.
- ERA (1974). *A natural systems study of the southern Mornington Peninsula*. Environmental Resources of Australia Pty, Ltd. report for Westernport Regional Planning Authority, Melbourne, Victoria.
- Ferns, L.W. & Hough, D. (eds.) (2000). *Environmental inventory of Victoria's marine ecosystems, stage 3, volume 2 - understanding biodiversity representativeness of Victoria's rocky reefs*. Parks, Flora and Fauna Division, Department of Natural Resources & Environment, Victoria. In part available online, NRE: information product 3 - habitat mapping at <http://www.nre.vic.gov.au>.
- Gordon, M. (1997). *Victoria's Mornington Peninsula*. Lock Haven Books: Dromana, Victoria.
- Gott, B. (1993). *Use of Victorian plants by Koories*. In *Flora of Victoria*, Volume 1: Introduction, ed. D. B. Foreman, Inkata Press: Melbourne.
- Government of Victoria (1970)a. *Statement of planning policy, No.1 Westernport*. Town & Country Planning Board, Victoria.
- Government of Victoria (1970)b. *Statement of planning policy, No.2 Mornington Peninsula*. Town & Country Planning Board, Victoria.
- Gunthorpe, L. & Hamer, P. (1998). *Western Port fish habitat 1998: Fisheries assessment report series 22*. Department of Natural Resources and Environment, Victoria.
- Goulding, M.(1988). *Aboriginal occupation of the Melbourne area, District 2: A report to the Land Conservation Council*. Land Conservation Council, Victoria.
- Jenkin, J.J. (1974). *The geology of the Mornington Peninsula and Western Port*. Mines Department: Melbourne, Victoria.
- Kellock & Associates (2000). *Technical report 2 summary: Planning Melbourne for the 21st century, green wedges and other non-urban areas in Melbourne*. Report for Department of Infrastructure, Victoria. Online at <http://www.doi.vic.gov.au/metroplan>.
- LCC (1991). *Melbourne area District 2 review descriptive report*. Land Conservation Council, Victoria.
- LCC (1993). *Marine and coastal special investigation descriptive report*. Land Conservation Council, Victoria.
- LCC (1994). *Melbourne area District 2 review final recommendations*. Land Conservation Council, Victoria.
- LCC (1996). *Marine and coastal special investigation: Draft final recommendations*. Land Conservation Council, Victoria.
- Loyn, R.H. (1975). *Report on the avifauna of Westernport Bay: Report to the Westernport Bay Environmental Study*. Ministry for Conservation, Victoria.
- Loyn, R.H. (1978). *A survey of birds in Westernport Bay, Victoria, 1973-74*. EMU 78(1): 11 -19.
- Lumsden, L.F. (1992). *Sites of high conservation value for fauna within the Melbourne area District 2 study area*. Wildlife Branch, Department of Conservation & Environment, Victoria.
- Lunt, I.D. (1990). *Species-area curves and growth-form spectra for some herb-rich woodlands in western Victoria*. Australian Journal of Ecology 15: 155 - 161.
- McDonnell, M.J., Williams, N.S.G, & A.K. Hahs. (1999). *A reference guide to the ecology and natural resources of the Melbourne region. A bibliography of the biodiversity literature for scientists, teachers, policy makers, planners and natural resource managers*. Australian Research Centre for Urban Ecology, Royal Botanic Gardens, Melbourne. Online at http://arcue.rbg.vic.gov.au/alt_pa_3b.htm.
- McGregor, G. (1989). *Point Nepean national park management plan: Point Nepean section*. Commonwealth of Australia and Department of Conservation Forestry & Lands, Victoria.
- Menkhorst, P.E. (1995). *Mammals of Victoria*, Oxford University Press, Melbourne.

- Moorhead, L.M. (1971).** *Mornington - in the wake of Flinders*. Shire of Mornington, Victoria.
- MPSC (2001)a.** *A sustainability framework for Mornington Peninsula Shire*. Online at <http://www.mornpen.vic.gov.au>.
- MPSC (2001)b.** *Recreational developments in rural areas, draft discussion paper, September 2001*. Online at <http://www.mornpen.vic.gov.au>.
- MPVA (in press).** *The Mornington Peninsula wine industry: A community guide to environmental best practice winemaking and vineyard management*. Mornington Peninsula Vignerons Association, Red Hill South, Victoria.
- National Trust of Australia (Vic). (2002).** The National Trust register. Online at <http://www.nattrust.com.au>.
- Nicholson, V. (1995).** *Tourism on the Mornington Peninsula*. PhD thesis, Monash University, Victoria.
- NRE (1997).** *Victoria's biodiversity*. Department of Natural Resources & Environment, Victoria. Online at <http://www.nre.vic.gov.au>.
- NRE (1999).** *NRE: Parks and reserves: Ramsar information sheets: Western Port*. Department of Natural Resources & Environment, Victoria. Online at <http://www.nre.vic.gov.au>.
- NRE (2000)a.** *NRE: Plants and animals: Rare or threatened vascular plants in Victoria - 2000*. Department of Natural Resources & Environment, Victoria. Online at <http://www.nre.vic.gov.au>.
- NRE (2000)b.** *NRE: Plants and animals: Threatened vertebrate fauna in Victoria - 2000*. Department of Natural Resources & Environment, Victoria. Online at <http://www.nre.vic.gov.au>.
- NRE (2000)c.** *NRE: Plants and animals: Victorian wildlife database*. Department of Natural Resources & Environment, Victoria. Online at <http://www.nre.vic.gov.au>.
- NRE (2001)a.** *Flora information system database*. Department of Natural Resources & Environment, Victoria. Online at <http://www.nre.vic.gov.au>.
- NRE (2001)b.** *NRE: Plants and animals: Information sheets: Threatened species*. Department of Natural Resources & Environment, Victoria. Online at <http://www.nre.vic.gov.au>.
- Oates, A. & Taranto, M. (2001).** *Vegetation mapping of the Port Phillip & Western Port region*. Arthur Rylah Institute for Environmental Research, Department of Natural Resources & Environment, Victoria. Online at <http://www.nre.vic.gov.au>.
- OCE. (1991).** *1991 State of the environment report: Agriculture and Victoria's environment resource report*. Office of the Commissioner for the Environment, Victoria.
- Opie, A.M., Gullan, P.K., van Berkel, S.C., & van Rees, H. (1984).** *Sites of botanical significance in the Western Port region*. ESS No. 328, Department of Conservation Forests & Lands, Victoria.
- Parks Victoria (2002).** *Western Port Ramsar site: Draft strategic management plan*. Parks Victoria, Department of Natural Resources & Environment, Victoria. Online at http://www.parkweb.vic.gov.au/resources/O8_0637.pdf.
- Parliament of Victoria (1998).** *Report on weeds in Victoria: May 1998*. Environment & Natural Resources Committee, Parliament of Victoria. Government Printer: Melbourne.
- Port Phillip CALP Board (1998).** *Port Phillip and Western Port regional catchment strategy*. Port Phillip Catchment and Land Protection Board, Department of Natural Resources & Environment, Victoria. Online at <http://www.nre.vic.gov.au/catchmnt/partner/portphil/portcon.htm>.
- Port Phillip CALP Board (2000).** *Draft Port Phillip and Westernport native vegetation plan*. Port Phillip Catchment & Land Protection Board, Department of Natural Resources & Environment, Victoria. Online at <http://www.calpboard.vic.gov.au>.
- Presland, G. (1994).** *Aboriginal Melbourne: The lost land of the Kulin people*. McPhee Gribble: Melbourne.
- RAC (1993).** *Coastal zone inquiry - Victorian case study*. Resource Assessment Commission, Commonwealth of Australia.
- Rosengren, N.J. (1984).** *Sites of geological and geomorphological significance in the Westernport Bay catchment*. ESS No. 401, Department of Conservation Forests & Lands, Victoria.

Seddon, G. (1974). *A landscape assessment of the southern Mornington Peninsula, Victoria: a report to the Western Port Regional Planning Authority.* Centre for Environmental Studies, University of Melbourne.

Shapiro, M.A. (1975). *Westernport Bay environmental study, 1973 - 1974.* ESS No. 502, Ministry of Conservation, Victoria.

Sullivan, H. (1981). *An archaeological survey of the Mornington Peninsula, Victoria.* Occasional reports series - Victoria archaeological survey no. 6, Victoria Archaeological Survey, Ministry for Conservation, Victoria.

Tourism Victoria (1996). *Victorian regional travel and tourism survey.* Tourism Victoria, Department of Tourism, Sport & Commonwealth Games, Victoria.

Tourism Victoria (2002). Website of Tourism Victoria, Department of Tourism, Sport & Commonwealth Games, Victoria. Online at <http://www.visitvictoria.com.au>.

Urban Enterprises Pty Ltd. (1999). *Greater Peninsula tourism: The value of tourism to the Mornington Peninsula economy.* Report for Mornington Peninsula Shire Council, Victoria.

Urban Enterprises Pty Ltd. (2000). *Mornington Peninsula tourism: The health of tourism on the Mornington Peninsula 1999/2000.* Report for Mornington Peninsula Shire Council, Victoria.

WPCC. (1980). *The Westernport catchment resources inventory: Volume 2.* Western Port Catchment Co-ordinating Group, Victoria.

Yugovic, J. (2002). *Personal communications.* Biosis Research Pty Ltd, Melbourne, Victoria.

APPENDICES

APPENDIX 1. Flora of national or State significance recorded in Stages 1 and 2 of the proposed Biosphere reserve

Source: NRE Flora Information System 2001 Version

AROTS: Australian Rare or Threatened Species (Briggs & Leigh 1996)

E	Endangered in Australia
V	Vulnerable in Australia
R	Rare in Australia
K	Insufficiently known in Australia

VROTS: Victorian Rare or Threatened Species (NRE Flora Information System 2001 Version)

e	Endangered in Victoria
v	Vulnerable in Victoria
r	Rare in Victoria
k	Insufficiently known in Victoria

EPBC: Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)

E	Listed as endangered
V	Listed as vulnerable

FFG: Flora and Fauna Guarantee Act 1988 (Vic.)

L	Listed as threatened
---	----------------------

NATIONAL SIGNIFICANCE:

AROTS	VROTS	EPBC	FFG	NAME	COMMON NAME
E	x	E	L	<i>Caladenia thysanochila</i>	Fringed Spider-orchid
E	e	E		<i>Dianella amoena</i>	Matted Flax-lily
E	e	E	L	<i>Euphrasia collina ssp. muelleri</i>	Purple Eyebright
E	e	E	L	<i>Prasophyllum frenchii</i>	Maroon Leek-orchid
V	k	V		<i>Amphibromus fluitans</i>	River Swamp Wallaby-grass
V	v	V	L	<i>Astelia australiana</i>	Tall Astelia
V	v	V	L	<i>Bracteantha palustris</i>	Swamp Everlasting
V	v	V		<i>Caladenia insularis</i>	French Island Spider-orchid
V	r	V		<i>Caladenia tessellata</i>	Thick-lip Spider-orchid
V	v	V		<i>Eucalyptus strzeleckii</i>	Strzelecki Gum
V	v	V	L	<i>Glycine latrobeana</i>	Clover Glycine
V	v	V		<i>Prasophyllum spicatum</i>	Dense Leek-orchid
V	v	V		<i>Pterostylis chlorogramma</i>	Green-striped Greenhood
V	v	V	L	<i>Pterostylis cucullata</i>	Leafy Greenhood
R	r			<i>Burnettia cuneata</i>	Lizard Orchid
R	v		L	<i>Cyathea cunninghamii</i>	Slender Tree-fern
R	k			<i>Eucalyptus yarraensis</i>	Yarra Gum
R	v		L	<i>Grevillea barklyana</i>	Gully Grevillea
R	r			<i>Pomaderris oraria</i>	Bassian Pomaderris
R	r			<i>Pultenaea weindorferi</i>	Swamp Bush-pea
R	r			<i>Tetratheca stenocarpa</i>	Long Pink-bells
K	v			<i>Caladenia oenochila</i>	Wine-lipped Spider-orchid
K				<i>Genoplesium despectans</i>	Sharp Midge-orchid

STATE SIGNIFICANCE:

	e		L	<i>Adiantum capillus-veneris</i>	Venus-hair Fern
	e			<i>Craspedia canens</i>	Grey Billy-buttons
	e			<i>Thelymitra longiloba</i>	Marsh Sun-orchid
	e		L	<i>Thelymitra merraniae</i>	Merran's Sun-orchid
	v			<i>Adriana quadripartita</i>	Coast Bitter-bush
	v			<i>Agrostis aemula var. setifolia</i>	Gilgai Blown-grass
	v		L	<i>Agrostis billardierei var. filifolia</i>	Gilgai Blown-grass
	v	V		<i>Asplenium obtusatum</i>	Shore Spleenwort
	v			<i>Atriplex billardierei</i>	Glistening Saltbush
	v			<i>Corybas despectans</i>	Coast Helmet-orchid
	v			<i>Craspedia paludicola</i>	Swamp Billy-buttons
	v			<i>Dianella longifolia var. grandis</i>	Glaucous Flax-lily

STATE SIGNIFICANCE:

AROTS	VROTS	EPBC	FFG	NAME	COMMON NAME
	v		L	<i>Diuris punctata</i> var. <i>punctata</i>	Purple Diuris
	v			<i>Gahnia grandis</i>	Brickmakers' Sedge
	v			<i>Geranium solanderi</i> var. <i>solanderi</i>	Austral Cranesbill
	v			<i>Helichrysum</i> aff. <i>rutidolepis</i> (Lowland Swamps)	Pale Swamp Everlasting
	v			<i>Leptecophylla juniperina</i>	Crimson Berry
	v			<i>Microtis orbicularis</i>	Dark Mignonette-orchid
	v			<i>Persoonia arborea</i>	Tree Geebung
	v			<i>Prasophyllum lindleyanum</i>	Green Leek-orchid
	v			<i>Prasophyllum parviflorum</i>	Slender Leek-orchid
	v			<i>Thelymitra benthamiana</i>	Blotched Sun-orchid
	v			<i>Thelymitra circumsepta</i>	Naked Sun-orchid
	v			<i>Thelymitra malvina</i>	Mauve-tuft Sun-orchid
	v			<i>Thelymitra mucida</i>	Plum Orchid
	v			<i>Thelymitra</i> X <i>macmillanii</i>	Crimson Sun-orchid
	r			<i>Acacia leprosa</i>	Dandenong Range Cinnamon Wattle
	r			<i>Acacia retinodes</i> var. <i>uncifolia</i>	Coast Wirilda
	r			<i>Agrostis rudis</i>	Ruddy Bent
	r			<i>Atriplex paludosa</i>	Marsh Saltbush
	r			<i>Austrofestuca littoralis</i>	Coast Fescue
	r			<i>Avicennia marina</i>	White Mangrove
	r			<i>Baeckea ramosissima</i> ssp. <i>prostrata</i>	Rosy Baeckea
	r			<i>Caladenia aurantiaca</i>	Orange-tip Caladenia
	r			<i>Carex alsophila</i>	Forest Sedge
	r			<i>Cephalomanes caudatum</i>	Jungle Bristle-fern
	r			<i>Chiloglottis</i> X <i>pescottiana</i>	Bronze Bird-orchid
	r			<i>Correa reflexa</i> var. <i>lobata</i>	Powelltown Correa
	r			<i>Corybas aconitiflorus</i>	Spurred Helmet-orchid
	r			<i>Distichophyllum microcarpum</i>	Moss
	r			<i>Eucalyptus fulgens</i>	Green Scentbark
	r			<i>Exocarpos syrticola</i>	Coast Ballart
	r			<i>Genoplesium pumilum</i>	Green Midge-orchid
	r			<i>Geranium</i> sp. 3	Pale-flower Cranesbill
	r			<i>Ixiolaena</i> sp. 1	Woolly Buttons
	r			<i>Juncus revolutus</i>	Creeping Rush
	r			<i>Lastreopsis hispida</i>	Bristly Shield-fern
	r			<i>Lawrencina spicata</i>	Salt Lawrencina
	r			<i>Leionema bilobum</i> ssp. 3 (West Gippsland)	Toothed Leionema
	r			<i>Lepidosperma canescens</i>	Hoary Rapier-sedge
	r			<i>Limonium australe</i>	Yellow Sea-lavender
	r			<i>Lindsaea microphylla</i>	Lacy Wedge-fern
	r			<i>Monotoca glauca</i>	Currant-wood
	r			<i>Olearia</i> sp. 2	Peninsula Daisy-bush
	r			<i>Oxalis rubens</i>	Dune Wood-sorrel
	r			<i>Poa poiformis</i> var. <i>ramifer</i>	Dune Poa
	r			<i>Pteris comans</i>	Netted brake
	r			<i>Pterostylis grandiflora</i>	Cobra Greenhood
	r			<i>Pterostylis</i> X <i>ingens</i>	Sharp Greenhood
	r			<i>Pultenaea canaliculata</i>	Coast Bush-pea
	r			<i>Rytidosperma dimidiatum</i>	Tasmanian Wallaby-grass
	r			<i>Salsola kali</i> aff. ssp. <i>tragus</i>	Coast Saltwort
	r			<i>Schoenus carsei</i>	Wiry Bog-sedge
	r			<i>Sowerbaea juncea</i>	Rush Lily
	r			<i>Thelymitra</i> X <i>irregularis</i>	Crested Sun-orchid
	r			<i>Tmesipteris ovata</i>	Oval Fork-fern
	r			<i>Triglochin minutissimum</i>	Tiny Arrowgrass
	r			<i>Triglochin mucronatum</i>	Prickly Arrowgrass
	r			<i>Xanthosia tasmanica</i>	Southern Xanthosia
	k			<i>Agrostis avenacea</i> var. <i>perennis</i>	Wetland Blown-grass
	k			<i>Amphibolis antarctica</i>	Sea Nymph
	k			<i>Atriplex australasica</i>	Native Orache
	k			<i>Austrodanthonia bipartita</i> .	Leafy Wallaby-grass
	k			<i>Berula erecta</i>	Water Parsnip
	k			<i>Bryum</i> aff. <i>alpinum</i>	Moss

STATE SIGNIFICANCE:

AROTS	VROTS	EPBC	FFG	NAME	COMMON NAME
	k			<i>Caladenia australis</i>	Southern Spider-orchid
	k			<i>Caladenia dilatata s.s.</i>	Green-comb Spider-orchid
	k			<i>Caladenia parva</i>	Small Spider-orchid
	k			<i>Caladenia prolata</i>	Fertile Caladenia
	k			<i>Caladenia vulgaris</i>	Slender Caladenia
	k			<i>Cardamine tenuifolia</i>	Slender Bitter-cress
	k			<i>Carex chlorantha</i>	Green-top Sedge
	k			<i>Chorizandra australis</i>	Southern Bristle-sedge
	k			<i>Desmodium varians</i>	Slender Tick-trefoil
	k			<i>Entolasia stricta</i>	Upright Panic
	k			<i>Genoplesium ciliatum</i>	Fringed Midge-orchid
	k			<i>Geranium sp. 14</i>	Valley Cranesbill
	k			<i>Halophila australis</i>	Oval Sea-wrack
	k			<i>Lepidium pseudohyssopifolium</i>	Native Peppercress
	k			<i>Lotus australis</i>	Austral Trefoil
	k			<i>Pterostylis tasmanica</i>	Southern Bearded Greenhood
	k			<i>Ranunculus papulentus</i>	Large River Buttercup
	k			<i>Sarcocornia quinqueflora ssp. tasmanica</i>	Beaded Glasswort
	k			<i>Stackhousia spathulata</i>	Coast Stackhousia
	k			<i>Telaranea tetradactyla</i>	Liverwort
	k			<i>Thelymitra improcera</i>	Heathland Sun-orchid
	k			<i>Thelymitra sp. aff. ixioides</i>	French Island Sun-orchid
	k			<i>Viola sieberiana</i>	Tiny Violet

APPENDIX 2. Fauna of national or State significance recorded in Stages 1 and 2 of the proposed Biosphere reserve

Source: NRE Atlas of Victorian Wildlife

NRE: Threatened Vertebrate Fauna in Victoria – 2000 (NRE 2000).

CEn	Critically endangered
End	Endangered
Vul	Vulnerable
LR	Lower risk – near threatened
Ins	Data deficient

EPBC: Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)

E	Listed as endangered
V	Listed as vulnerable

FFG: Flora and Fauna Guarantee Act 1988 (Vic.)

L	Listed as threatened
---	----------------------

NATIONAL SIGNIFICANCE:

EPBC	NRE	FFG	COMMON NAME	SCIENTIFIC NAME
E	CEn	L	Orange-bellied Parrot	<i>Neophema chrysogaster</i>
E	End	L	Swift Parrot	<i>Lathamus discolor</i>
E	End	L	Helmeted Honeyeater	<i>Lichenostomus melanops cassidix</i>
E			Southern Brown Bandicoot	<i>Isoodon obesulus</i>
E	End	L	Leadbeater's Possum	<i>Gymnobelideus leadbeateri</i>
E	CEn	L	Southern Right Whale	<i>Eubalaena australis</i>
E			Loggerhead Turtle	<i>Caretta caretta</i>
V			Blue Petrel	<i>Halobaena caerulea</i>
V	CEn		Wandering Albatross	<i>Diomedea exulans</i>
V			Grey-headed Albatross	<i>Diomedea chrysostoma</i>
V	End	L	Superb Parrot	<i>Polytelis swainsonii</i>
V	End	L	Spot-tailed Quoll	<i>Dasyurus maculatus</i>
V	LR		Long-nosed Potoroo	<i>Potorous tridactylus</i>
V	End		Humpback Whale	<i>Megaptera novaeangliae</i>
V	End		Leathery Turtle	<i>Dermochelys coriacea</i>
V	Vul	L	Warty Bell Frog	<i>Litoria raniformis</i>
V	Vul	L	Australian Grayling	<i>Prototroctes maraena</i>
V	Vul	L	Giant Gippsland Earthworm	<i>Megascolides australis</i>

STATE SIGNIFICANCE:

EPBC	NRE	FFG	COMMON NAME	SCIENTIFIC NAME
	Ins		Brown Quail	<i>Coturnix ypsilophora</i>
	CEn		King Quail	<i>Coturnix chinensis</i>
	Vul		Diamond Dove	<i>Geopelia cuneata</i>
	End	L	Lewin's Rail	<i>Rallus pectoralis</i>
	Vul		Baillon's Crake	<i>Porzana pusilla</i>
	Vul		White-faced Storm-Petrel	<i>Pelagodroma marina</i>
			Fluttering Shearwater	<i>Puffinus gavia</i>
			Sooty Shearwater	<i>Puffinus griseus</i>
			Short-tailed Shearwater	<i>Puffinus tenuirostris</i>

STATE SIGNIFICANCE:

EPBC	NRE	FFG	COMMON NAME	SCIENTIFIC NAME
			Flesh-footed Shearwater	<i>Puffinus carneipes</i>
			Southern Fulmar	<i>Fulmarus glacialisoides</i>
			Great-winged Petrel	<i>Pterodroma macroptera</i>
			White-headed Petrel	<i>Pterodroma lessonii</i>
			Gould's Petrel	<i>Pterodroma leucoptera</i>
			Cape Petrel	<i>Daption capense</i>
			Broad-billed Prion	<i>Pachyptila vittata</i>
LR			Fairy Prion	<i>Pachyptila turtur</i>
			Antarctic Prion	<i>Pachyptila desolata</i>
LR			Common Diving-Petrel	<i>Pelecanoides urinatrix</i>
			Black-browed Albatross	<i>Diomedea melanophris</i>
			Yellow-nosed Albatross	<i>Diomedea chlororhynchos</i>
			Shy Albatross	<i>Diomedea cauta</i>
			Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>
Vul			Black-faced Cormorant	<i>Phalacrocorax fuscescens</i>
LR			Pied Cormorant	<i>Phalacrocorax varius</i>
Vul			Australasian Gannet	<i>Morus serrator</i>
LR			Whiskered Tern	<i>Chlidonias hybridus</i>
End			Gull-billed Tern	<i>Sterna nilotica</i>
Vul			Caspian Tern	<i>Sterna caspia</i>
LR			Crested Tern	<i>Sterna bergii</i>
Vul	L		Little Tern	<i>Sterna albifrons</i>
Vul	L		Fairy Tern	<i>Sterna nereis</i>
LR			Pacific Gull	<i>Larus pacificus</i>
			Arctic Jaeger	<i>Stercorarius parasiticus</i>
End	L		Hooded Plover	<i>Thinornis rubricollis</i>
LR			Eastern Curlew	<i>Numenius madagascariensis</i>
Vul			Glossy Ibis	<i>Plegadis falcinellus</i>
Vul			Royal Spoonbill	<i>Platalea regia</i>
CEn			Little Egret	<i>Egretta garzetta</i>
CEn	L		Intermediate Egret	<i>Ardea intermedia</i>
End	L		Great Egret	<i>Ardea alba</i>
Vul			Nankeen Night Heron	<i>Nycticorax caledonicus</i>
End			Australasian Bittern	<i>Botaurus poiciloptilus</i>
Vul			Cape Barren Goose	<i>Cereopsis novaehollandiae</i>
End			Magpie Goose	<i>Anseranas semipalmata</i>
Vul			Australasian Shoveler	<i>Anas rhynchotis</i>
End	L		Freckled Duck	<i>Stictonetta naevosa</i>
Vul			Hardhead	<i>Aythya australis</i>
Vul			Blue-billed Duck	<i>Oxyura australis</i>
Vul			Musk Duck	<i>Biziura lobata</i>
LR			Grey Goshawk	<i>Accipiter novaehollandiae</i>
End	L		White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>
End			Black Falcon	<i>Falco subniger</i>
End	L		Barking Owl	<i>Ninox connivens</i>
End	L		Powerful Owl	<i>Ninox strenua</i>
End	L		Masked Owl	<i>Tyto novaehollandiae</i>
Vul	L		Sooty Owl	<i>Tyto tenebricosa</i>
Vul	L		Major Mitchell's Cockatoo	<i>Cacatua leadbeateri</i>
LR	L		Turquoise Parrot	<i>Neophema pulchella</i>
	L		Hooded Robin	<i>Melanodryas cucullata</i>
			Crested Bellbird	<i>Oreoica gutturalis</i>
End	L		Grey-crowned Babbler	<i>Pomatostomus temporalis</i>
Ins			Chestnut-rumped Heathwren	<i>Hylacola pyrrhopygia</i>
			Brown Treecreeper	<i>Climacteris picumnus</i>
Vul	L		Painted Honeyeater	<i>Grantiella picta</i>
	L		Beautiful Firetail	<i>Stagonopleura bella</i>
			Hutton's Shearwater	<i>Puffinus huttoni</i>
End			Southern Giant-Petrel	<i>Macronectes giganteus</i>
			Long-tailed Jaeger	<i>Stercorarius longicaudus</i>
			Ruff	<i>Philomachus pugnax</i>
			Kerguelen Petrel	<i>Lugensa brevirostris</i>
End			Northern Giant-Petrel	<i>Macronectes halli</i>

STATE SIGNIFICANCE:				
EPBC	NRE	FFG	COMMON NAME	SCIENTIFIC NAME
			Salvin's Prion	<i>Pachyptila salvini</i>
			Slender-billed Prion	<i>Pachyptila belcheri</i>
	Ins		Pomarine Jaeger	<i>Stercorarius pomarinus</i>
			Arctic Tern	<i>Sterna paradisaea</i>
			Common Tern	<i>Sterna hirundo</i>
	Ins		Pectoral Sandpiper	<i>Calidris melanotos</i>
			Great Skua	<i>Catharacta skua</i>
	CEn		Kelp Gull	<i>Larus dominicanus</i>
	LR		Swamp Antechinus	<i>Antechinus minimus</i>
			White-footed Dunnart	<i>Sminthopsis leucopus</i>
			Yellow-bellied Glider	<i>Petaurus australis</i>
			Koala	<i>Phascolarctos cinereus</i>
	Vul		Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>
	Vul	L	Common Bent-wing Bat	<i>Miniopterus schreibersii</i>
	LR		Broad-toothed Rat	<i>Mastacomys fuscus</i>
	CEn	L	New Holland Mouse	<i>Pseudomys novaehollandiae</i>
	Vul		Australian Fur Seal	<i>Arctocephalus pusillus</i>
	Ins		Tree Goanna	<i>Varanus varius</i>
	Vul	L	Swamp Skink	<i>Egernia coventryi</i>
	LR		Glossy Grass Skink	<i>Pseudemoia rawlinsoni</i>
	Ins	L	Mountain Galaxias	<i>Galaxias olidus</i>
	LR	L	Dwarf Galaxias	<i>Galaxiella pusilla</i>
	Ins		River Blackfish	<i>Gadopsis marmoratus</i>
	Vul		Pale Mangrove Goby	<i>Mugilogobius paludis</i>
	Ins		Caddisfly (5016)	<i>Plectrotarsus gravenhorstii</i>
	R/R	L	Narracan Burrowing Cray	<i>Engaeus phyllocercus</i>
	End	L	Warragul Burrowing Cray	<i>Engaeus sternalis</i>
	Vul	L	Marine opisthobranch	<i>Platydoris galbana</i>
	Vul	L	Marine opisthobranch	<i>Rhodope sp.</i>

APPENDIX 3. Species listed as migratory or marine under the EPBC Act

Source: NRE Atlas of Victorian Wildlife

'Migratory' encompasses species listed under CAMBA, JAMBA or Bonn Convention

COMMON NAME	SCIENTIFIC NAME	MIGRATORY	MARINE
Southern Right Whale	<i>Eubalaena australis</i>	√	√
Humpback Whale	<i>Megaptera novaeangliae</i>	√	√
Loggerhead Turtle	<i>Caretta caretta</i>	√	√
Leathery Turtle	<i>Dermochelys coriacea</i>	√	√
Sooty Shearwater	<i>Puffinus griseus</i>	√	√
Short-tailed Shearwater	<i>Puffinus tenuirostris</i>	√	√
Flesh-footed Shearwater	<i>Puffinus carneipes</i>	√	√
Southern Giant-Petrel	<i>Macronectes giganteus</i>	√	√
Northern Giant-Petrel	<i>Macronectes halli</i>	√	√
Pomarine Jaeger	<i>Stercorarius pomarinus</i>	√	√
Long-tailed Jaeger	<i>Stercorarius longicaudus</i>	√	√
Wandering Albatross	<i>Diomedea exulans</i>	√	√
Black-browed Albatross	<i>Diomedea melanophris</i>	√	√
Yellow-nosed Albatross	<i>Diomedea chlororhynchos</i>	√	√
Grey-headed Albatross	<i>Diomedea chrysostoma</i>	√	√
Common Tern	<i>Sterna hirundo</i>	√	√
Caspian Tern	<i>Sterna caspia</i>	√	√
Shy Albatross	<i>Diomedea cauta</i>	√	√
Ruddy Turnstone	<i>Arenaria interpres</i>	√	
Red-kneed Dotterel	<i>Erythronyctes alpinus</i>	√	
Masked Lapwing	<i>Vanellus miles</i>	√	
Banded Lapwing	<i>Vanellus tricolor</i>	√	
Grey Plover	<i>Pluvialis squatarola</i>	√	
Pacific Golden Plover	<i>Pluvialis fulva</i>	√	
Hooded Plover	<i>Thinornis rubricollis</i>	√	
Lesser Sand Plover	<i>Charadrius mongolus</i>	√	
Double-banded Plover	<i>Charadrius bicinctus</i>	√	
Greater Sand Plover	<i>Charadrius leschenaultii</i>	√	
Oriental Plover	<i>Charadrius veredus</i>	√	
Red-capped Plover	<i>Charadrius ruficapillus</i>	√	
Black-fronted Dotterel	<i>Euseyonis melanops</i>	√	
Black-winged Stilt	<i>Himantopus himantopus</i>	√	
Banded Stilt	<i>Cladorhynchus leucocephalus</i>	√	
Red-necked Avocet	<i>Recurvirostra novaehollandiae</i>	√	
Eastern Curlew	<i>Numenius madagascariensis</i>	√	
Whimbrel	<i>Numenius phaeopus</i>	√	
Black-tailed Godwit	<i>Limosa limosa</i>	√	
Bar-tailed Godwit	<i>Limosa lapponica</i>	√	
Wood Sandpiper	<i>Tringa glareola</i>	√	
Grey-tailed Tattler	<i>Heteroscelus brevipes</i>	√	
Common Sandpiper	<i>Actitis hypoleucos</i>	√	
Common Greenshank	<i>Tringa nebularia</i>	√	
Marsh Sandpiper	<i>Tringa stagnatilis</i>	√	
Terek Sandpiper	<i>Xenus cinereus</i>	√	
Curlew Sandpiper	<i>Calidris ferruginea</i>	√	
Red-necked Stint	<i>Calidris ruficollis</i>	√	
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>	√	
Broad-billed Sandpiper	<i>Limicola falcinellus</i>	√	
Pectoral Sandpiper	<i>Calidris melanotos</i>	√	
Red Knot	<i>Calidris canutus</i>	√	
Great Knot	<i>Calidris tenuirostris</i>	√	
Sanderling	<i>Calidris alba</i>	√	
Latham's Snipe	<i>Gallinago hardwickii</i>	√	
Cattle Egret	<i>Ardea ibis</i>	√	
Great Egret	<i>Ardea alba</i>	√	
Cape Barren Goose	<i>Cereopsis novaehollandiae</i>	√	
Magpie Goose	<i>Anseranas semipalmata</i>	√	

COMMON NAME	SCIENTIFIC NAME	MIGRATORY	MARINE
Australian Wood Duck	<i>Chenonetta jubata</i>	√	
Black Swan	<i>Cygnus atratus</i>	√	
Australian Shelduck	<i>Tadorna tadornoides</i>	√	
Pacific Black Duck	<i>Anas superciliosa</i>	√	
Chestnut Teal	<i>Anas castanea</i>	√	
Grey Teal	<i>Anas gracilis</i>	√	
Australasian Shoveler	<i>Anas rhynchotis</i>	√	
Pink-eared Duck	<i>Malacorhynchus membranaceus</i>	√	
Freckled Duck	<i>Stictonetta naevosa</i>	√	
Hardhead	<i>Aythya australis</i>	√	
Blue-billed Duck	<i>Oxyura australis</i>	√	
Musk Duck	<i>Biziura lobata</i>	√	
Spotted Harrier	<i>Circus assimilis</i>	√	
Swamp Harrier	<i>Circus approximans</i>	√	
Grey Goshawk	<i>Accipiter novaehollandiae</i>	√	
Brown Goshawk	<i>Accipiter fasciatus</i>	√	
Collared Sparrowhawk	<i>Accipiter cirrhocephalus</i>	√	
Wedge-tailed Eagle	<i>Aquila audax</i>	√	
Little Eagle	<i>Hieraetus morphnoides</i>	√	
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	√	
Whistling Kite	<i>Haliastur sphenurus</i>	√	
Black-shouldered Kite	<i>Elanus axillaris</i>	√	
Letter-winged Kite	<i>Elanus scriptus</i>	√	
Australian Hobby	<i>Falco longipennis</i>	√	
Peregrine Falcon	<i>Falco peregrinus</i>	√	
Black Falcon	<i>Falco subniger</i>	√	
Brown Falcon	<i>Falco berigora</i>	√	
Nankeen Kestrel	<i>Falco cenchroides</i>	√	
Orange-bellied Parrot	<i>Neophema chrysogaster</i>	√	
White-throated Needletail	<i>Hirundapus caudacutus</i>	√	
Fork-tailed Swift	<i>Apus pacificus</i>	√	
Helmeted Honeyeater	<i>Lichenostomus melanops cassidix</i>	√	
Hooded Robin (SE)	<i>Melanodryas cucullata</i>	√	
Crested Bellbird (southern subspecies)	<i>Oreoica gutturalis gutturalis</i>	√	
Grey-crowned Babbler	<i>Potamostomus temporalis</i>	√	
Australian Sea Lion	<i>Neophoca cinerea</i>		√
Australian Fur Seal	<i>Arctocephalus pusillus</i>		√
New Zealand Fur Seal	<i>Arctocephalus forsteri</i>		√
Southern Elephant Seal	<i>Mirounga leonina</i>		√
Leopard Seal	<i>Hydrurga leptonyx</i>		√
Pygmy Right Whale	<i>Caperea marginata</i>		√
Minke Whale	<i>Balaenoptera acutorostrata</i>		√
Sperm Whale	<i>Physeter macrocephalus</i>		√
Pygmy Sperm Whale	<i>Kogia breviceps</i>		√
Gray's Beaked Whale	<i>Mesoplodon grayi</i>		√
Killer Whale	<i>Orcinus orca</i>		√
Long-finned Pilot Whale	<i>Globicephala melas</i>		√
Bottlenose Dolphin	<i>Tursiops truncatus</i>		√
Common Dolphin	<i>Delphinus delphis</i>		√
Subantarctic Fur Seal	<i>Arctocephalus tropicalis</i>		√
Rockhopper Penguin	<i>Eudyptes chrysocome</i>		√
Fiordland Penguin	<i>Eudyptes pachyrhynchus</i>		√
Little Penguin	<i>Eudyptula minor</i>		√
White-faced Storm-Petrel	<i>Pelagodroma marina</i>		√
Fluttering Shearwater	<i>Puffinus gavia</i>		√
Southern Fulmar	<i>Fulmarus glacialis</i>		√
Great-winged Petrel	<i>Pterodroma macroptera</i>		√
White-headed Petrel	<i>Pterodroma lessonii</i>		√
Gould's Petrel	<i>Pterodroma leucoptera</i>		√
Cape Petrel	<i>Daption capense</i>		√
Blue Petrel	<i>Halobaena caerulea</i>		√
Broad-billed Prion	<i>Pachyptila vittata</i>		√
Fairy Prion	<i>Pachyptila turtur</i>		√

COMMON NAME	SCIENTIFIC NAME	MIGRATORY	MARINE
Antarctic Prion	<i>Pachyptila desolata</i>		√
Common Diving-Petrel	<i>Pelecanoides urinatrix</i>		√
Great Cormorant	<i>Phalacrocorax carbo</i>		√
Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>		√
Black-faced Cormorant	<i>Phalacrocorax fuscescens</i>		√
Pied Cormorant	<i>Phalacrocorax varius</i>		√
Little Pied Cormorant	<i>Phalacrocorax melanoleucos</i>		√
Darter	<i>Anhinga melanogaster</i>		√
Australasian Gannet	<i>Morus serrator</i>		√
Whiskered Tern	<i>Chlidonias hybridus</i>		√
Gull-billed Tern	<i>Sterna nilotica</i>		√
White-fronted Tern	<i>Sterna striata</i>		√
Crested Tern	<i>Sterna bergii</i>		√
Little Tern	<i>Sterna albifrons</i>		√
Fairy Tern	<i>Sterna nereis</i>		√
Arctic Jaeger	<i>Stercorarius parasiticus</i>		√
Kerguelen Petrel	<i>Lugensa brevirostris</i>		√
Salvin's Prion	<i>Pachyptila salvini</i>		√
Slender-billed Prion	<i>Pachyptila belcheri</i>		√
Arctic Tern	<i>Sterna paradisaea</i>		√
Great Skua	<i>Catharacta skua</i>		√

BIBLIOGRAPHY

Publications and articles of relevance to the proposed Biosphere published in the past 10 years

Agriculture Victoria (2002). *Farming & agriculture: Australian regional wine grape crush survey.* Agriculture Victoria, Department of Natural Resources & Environment, Victoria. Online at <http://www.nre.vic.gov.au>.

ANZECC (1995). *Maritime accidents and pollution: impacts on the marine environment from shipping operations - paper for public comment , March 1995.* Australian and New Zealand Environment and Conservation Council, Environment Australia, Canberra.

ANZECC (1999). *Strategic plan of action for the national representative system of marine protected areas: A guide for action by Australian governments.* Australian and New Zealand Environment and Conservation Council, Environment Australia, Canberra.

ANZECC (2000). *Core environmental indicators for reporting on the state of the environment.* Australian and New Zealand Environment Conservation Council, Environment Australia, Canberra.

Appleby, G. (1999). *Western Port, and western shores of Port Phillip Bay and the Bellarine Peninsula.* Department of Natural Resources and Environment, Victoria.

Australian Archives & the Public Record Office of Victoria (1993). *My heart is breaking: A joint guide to records about Aboriginal people in the Public Record Office of Victoria and the Australian Archives.* Australian Government Publishing Service, Canberra.

Australian Bureau of Statistics. (1992). *Australia's environment: Issues and facts.* ABS catalogue No. 4140.0, Commonwealth of Australia, Canberra.

Australian Heritage Commission (2002). *Register of the National Estate database.* Online at <http://www.ahc.gov.au>.

Bateson, P. (2001). *Incentives for sustainable land management: Community cost sharing to conserve biodiversity on private lands, a guide for local government.* Environment Australia, Canberra.

Bathgate, R. (1999). *The ecological sustainability of marine fisheries: An overview of southern Australian fisheries.* Victorian National Parks Association, Victoria.

Belfroid, A. C., van Drunen, M., Beek, M.A., Schrap, S.M., van Gestel, C.A. & van Hattum, B. (1998). *Relative risks of transformation products of pesticides for aquatic ecosystems.* Science of the Total Environment **222(3)**: 167-83.

Bell, F. (2000). *Environmental issues associated with operating a winery and vineyard.* Online at <http://www.finlaysons.com.au/wine/eieio.html>.

Bell, F. (2000). *Winery effluent management.* Online at <http://www.finlaysons.com.au/wine/wem.html>

Bell, S. & Daniel, C. (2000). *Agrochemicals registered for use in Australian Viticulture 2000/2001.* The Australian Wine Research Institute. Online at <http://www.dpie.gov.au/nra/welcome.html>.

Bennett, S., Brereton, R., Mansergh, I., Berwick, S., Sandiford, K. & Wellington, C. (1991). *The potential effect of the enhanced greenhouse climate change on selected Victorian fauna.* Technical report series no.123. Arthur Rylah Institute of Environmental Research, Department of Natural Resources & Environment, Victoria.

Berry, L. (1997). *The use of roadside vegetation by birds in a fragmented landscape on the Mornington Peninsula, Victoria.* School of Aquatic Science and Natural Resources Management, Deakin University, Melbourne.

Biles, C. (1998). *Changes to benthic communities in the north arm of Western Port over 24 years.* Marine and Freshwater Resources Institute, Queenscliff, Victoria.

Bird, E.C.F. (1993). *The coast of Victoria: the shaping of scenery.* Melbourne University Press, Carlton, Victoria.

Blake, S. & Ball, D. (2001). *Victorian marine habitat database: seagrass mapping of Western Port.* Marine and Freshwater Resources Institute Queenscliff, Victoria.

Boura, J. (1994). *Fire and biodiversity: The effects and effectiveness of fire management.* Victorian National Parks Association, Victoria.

Briggs, J. D. & Leigh, J. H. (1996). *Rare or threatened Australian plants.* CSIRO & Australian Nature Conservation Agency, Canberra.

Brown, V. & Burke, G. (1993). *Between the devil and the deep blue sea – the information and research needs of Australia's coastal managers.* Coastal Zone Inquiry, Resource Assessment Commission, Canberra.

Brown, V.B., Davies, S.A. & Synnot, R.N. (1990). *Long-term monitoring of the effects of treated sewage on the intertidal macroalgal community near Cape Schanck, Victoria, Australia.* *Botanica Marina* **33**: 85 - 98.

Bruer, D. (1998). *Environmental management case study: Vineyard.* In Proceedings: Tenth Australian Wine Industry Technical Conference, Wine Titles, Adelaide.

Bureau of Meteorology (2002). *Climate of Australia: Climatic zones, and Climate of Victoria.* Online at <http://www.bom.gov.au/weather/vic>.

Cannon, M. (1993). *Black land, White land.* Minerva, Reed Books Australia, Melbourne.

Cardinia Shire Council (1999). *Municipal strategic statement.* Cardinia Shire Council, Victoria.

Carroll, P. (2001). *Summary of issues from public meeting: Grape Growing and the Community.* Meeting held at Red Hill Consolidated School, Red Hill, Victoria, February 2001.

Casey City Council (1999). *Municipal strategic statement.* Casey City Council, Victoria.

Catlin, J. & Ferns, L.W. (2000). *Australian coastal atlas: Victorian State node 1999/2000 annual report.* Parks, Flora and Fauna Division, Department of Natural Resources and Environment, Victoria.

Central Coastal Board (in press). *Western Port Bibliography.* Central Coastal Board, Department of Natural Resources and Environment, Victoria.

Cohen, B. F., McArthur, M. A., & Parry, G.D. (2000). *Exotic marine pests in Western Port.* Marine and Freshwater Resources Institute, Queenscliff, Victoria.

Coleman, N., Gason, A. S. H. & Poore, GCB. (1997). *High species richness in the shallow marine waters of south east Australia.* *Marine Ecology - Progress Series* **154**: 17 -26.

Coleman, R. (1999). *Health of waterways within the Port Phillip and Western Port catchments 1998.* Melbourne Water, Melbourne, Victoria.

Collins, M. (1990). *The comparative ecology of small mammals in coastal heath on French Island, Victoria, Australia.* Department of Zoology, La Trobe University, Bundoora, Victoria.

Collinson, M.H. & Muir, A.M. (1997). *Blind Bight sewage treatment plant: Flora and fauna investigation.* Ecology Australia Pty Ltd., Fairfield, Victoria.

Commonwealth (1993). *Biodiversity and its value - Biodiversity series.* Biodiversity Unit, Department of the Environment Sport and Territories, Commonwealth of Australia, Canberra.

Commonwealth (1996). *Fire and Biodiversity. The effects and effectiveness of fire management.* Department of Environment, Sport and Territories, Commonwealth of Australia, Canberra.

Commonwealth (2000). *Our sea, our future - major findings of the state of the marine environment report. Ocean Rescue Program.* Department of the Environment, Sport and Territories, Commonwealth of Australia, Canberra.

Commonwealth. (2000). *What's new with the action plan for salinity and water quality.* Department of the Environment, Sport and Territories, Commonwealth of Australia, Canberra.

Commonwealth (2002). *Website of the Department of Agriculture, Fisheries & Forestry – Australia. Covers many issues including: Landcare, greenhouse & Australia, salinity & water quality, economic research into Australian agriculture and much more.* Online at <http://www.dpie.gov.au>.

Condina, P. & Craigie, N.M. (1998). *Mornington Peninsula drainage area - Due diligence investigation.* Report for Melbourne Water & Mornington Peninsula Shire Council, Victoria.

Context & Ecology Australia. (1996)b. *Mornington Peninsula -Western Port Roadsides Management Plan, vols 1 & 2.* Reports for Mornington Peninsula Shire Council by Context Pty. Ltd. & Ecology Australia Pty Ltd, Clifton Hill, Victoria.

- Cook, D. (1998).** *Grasslands, grassy woodlands and grassy wetlands on the West Gippsland Plains: Sites of ecological significance.* Wholistic Ecology: Melbourne.
- Cotter, R. (2001).** *Boon Wurrung: People of the Port Phillip district.* Lavender Hill Multimedia: Red Hill South, Victoria.
- Coveney, J. (1990).** Report on the threats to national parks originating outside their boundaries. Footscray Institute of Technology, Melbourne.
- Cropper, S. & Breidhal, H. (1991).** *The Principles and methods of rare plant management.* Department of Conservation & Environment, Victoria.
- CSIRO (1992).** *Climate change scenarios for the Australian region.* Climate Impact Group, Division of Atmospheric Research, Commonwealth Scientific and Industrial Research Organisation, Melbourne.
- CSIRO (1996).** *Port Phillip Bay environmental study: Final Report, June 1996.* Commonwealth Scientific and Industrial Research Organisation, Melbourne.
- Dakis, P., Hayes, P., Noon, D., & Whiting, J. (1995).** *The profitability of investing in a small vineyard and winery - Research report series no. 87.* Agriculture Victoria, Bendigo, Victoria.
- De Araugo, T. & Vanston, M. K. (1993).** *Boonoorong on the Mornington Peninsula.* Rose Publishing House, Rosebud West, Victoria.
- DLPSC (1991).** *The Victorian Draft Decade of Landcare plan: towards sustainable land use; a discussion paper prepared for public comment.* Decade of Landcare Plan Steering Committee, Victoria.
- DOI (2000).** *Housing Melbourne, Residential Forecast 2000.* Department of Infrastructure, Victoria.
- DOI (2002).** *Planning schemes.* Department of Infrastructure, Victoria. Search for local Government areas: Mornington Peninsula, Bass Coast, City of Casey, Cardinia, Frankston. Online at <http://www.doi.vic.gov.au>.
- ECC (2000).** *Marine and estuarine investigation: Final report.* Environment Conservation Council, Victoria. Online at <http://www.nre.vic.gov.au/ecc/marinereport2000.htm>.
- Ecology Australia (2000).** *Devilbend and Bittern Reservoirs future use strategy: land use history, flora, fauna and archaeology.* Ecology Australia Pty Ltd, Melbourne, Victoria.
- Environment Australia (2001).** *Research project summary: Opportunities for the use of incentive payments to conserve native vegetation.* CSIRO Wildlife & Ecology, and Environment Australia, Canberra.
- EPA (1995).** *The distribution of seagrass in Western Port, Victoria.* Publication 490, Environment Protection Authority, Victoria.
- EPA (1997).** *Western Port 'Action +' program.* Publication 582, Environment Protection Authority Victoria.
- EPA (1998).** *The health of streams in the Western Port catchment.* Environment Protection Authority, Victoria.
- EPA (2000).** *Protecting the waters of Western Port and catchment: a summary of the Western Port and its catchment schedule (F8) to State Environment Protection Policy (Waters of Victoria).* Environment Protection Authority, Victoria. Online at <http://www.epa.vic.gov.au>.
- EPA (2001).** *Domestic wastewater management series: Land capability assessment for on-site domestic wastewater management.* Environment Protection Authority, Victoria. Online at <http://www.epa.vic.gov.au>.
- EPA (2001).** *Our Water our future: Draft outline of the State environment protection policy (Waters of Victoria).* Environment Protection Authority, Victoria. Online at <http://www.epa.vic.gov.au>.
- EPA (2002).** *Website for Environment Protection Authority, Victoria.* Includes many reports and publications on Western Port & Port Phillip Bay and catchments, and much more. Online at <http://www.epa.vic.gov.au>.
- Ferns, L.W., (ed.) (1999).** *Environmental inventory of Victoria's marine ecosystems, stage 4, part 1 - physical classification of soft benthic habitats of the open coast.* Parks, Flora and Fauna Division, Department of Natural Resources and Environment, Victoria.
- Ferns, L. W. & Hough, D. (eds.) (1999).** *Environmental inventory of Victoria's marine ecosystems, stage 3, volume 1.* Parks, Flora and Fauna Division, Department of Natural Resources and Environment, Victoria.

- Ferns, L.W. (ed.) (2000). *Environmental inventory of Victoria's marine ecosystems, stage 4, part 2 - Towards the identification of candidate soft benthic marine protected areas*. Parks, Flora and Fauna Division, Department of Natural Resources and Environment, Victoria.
- Ferns, L. W. & Hough, D. (eds.) (2000). *Environmental inventory of Victoria's marine ecosystems, stage 3, volume 2 - Understanding biodiversity representativeness of Victoria's rocky reefs*. Parks, Flora and Fauna Division, Department of Natural Resources and Environment, Victoria.
- Flinders Shire Council. (1992). *Coastal resource reference directory*. Flinders Shire Council, Rosebud, Victoria.
- Foreman, D. B. & Walsh, N. (1993). *Flora of Victoria, volume 1 – Introduction*. Royal Botanic Gardens, Melbourne, Victoria.
- Gott, B. (1993). *Use of Victorian plants by Koories*. In *Flora of Victoria Volume 1: Introduction*. N. G. Walsh & D. B. Foreman (eds.), Inkata Press: Melbourne, Victoria.
- Government of Victoria (1997). *Victoria's biodiversity - directions in management*. Government of Victoria, Government Printing Office, Melbourne, Victoria.
- Gretton, P. & Salma, S. (1996). *Land degradation and the Australian agricultural industry: Staff information paper*. Industry Commission, Commonwealth of Australia, Canberra.
- Gunthorpe, L. & Hamer, P. (eds.) (1998). *Western Port fish habitat 1998: Assessment Report Series 22*. Department of Natural Resources & Environment, Victoria.
- Handreck, C. P. & O'Hara, T.D. (1994). *Occurrence of selected species of intertidal and shallow subtidal invertebrates at Victorian locations*. Marine Research Group of Victoria Inc, report for Land Conservation Council, Victoria.
- Hardwick, R. (1998). *Waterway assessment in the Western Port catchment - the environmental health of Western Port Peninsula streams*. Report for Melbourne Water by Rod Hardwick AWT Pty Ltd, Melbourne, Victoria.
- Harty, C. (1997). *Mangroves in New South Wales and Victoria*. Vista: Melbourne.
- Hatton, T. & Nulsen, R. (2001). *Towards achieving functional ecosystem mimicry with respect to water cycling in southern Australian agriculture*. CSIRO, Canberra.
- Horrocks, G.F.B. & Brown, G.W. (1993). *The vertebrate fauna of Point Nepean, Victoria II. Birds*. Australian Bird Watcher 15: 24-34.
- IMCRA (1998). *Interim marine and coastal regionalisation for Australia: An ecosystem based classification for marine and coastal environments version 3.3*. Environment Australia, Commonwealth Department of the Environment, Canberra.
- Jaremovic, R., Davies, R., Goss, H., Watson, J., Wyatt, A., & Read, A. (1992). *Conservation plan for the Bittern coastal wetland area*. Report for Hastings Shire Council by Biosis Research Pty. Ltd., Marine Science and Ecology, & Ratio Consultants Pty. Ltd, Melbourne, Victoria.
- Jenkins, G.P., Watson, G.F. & Hammond, L.S. (1993). *Patterns of utilization of seagrass *Heterozostera* dominated habitats as nursery areas by commercially important fish: technical report 19*. Victorian Institute of Marine Science, Queenscliff, Victoria.
- Jenkins, G. P. & Wheatley, G. F. (1998). *The influence of habitat structure on nearshore fish assemblages in a southern Australian embayment - Comparison of shallow seagrass, reef-algal and unvegetated sand habitats, with emphasis on their importance to recruitment*. Journal of Experimental Marine Biology and Ecology 221(2): 147 - 172.
- Jenkins, M. (1995). *Plant community reference areas, Royal Botanic Gardens, Cranbourne*. Royal Botanic Gardens, Cranbourne.
- Kellock & Associates (2001). *Technical Report 2 Summary: Planning Melbourne for the 21st Century, green wedges and other non-urban areas in Melbourne*. Department of Infrastructure, Victoria. On line at <http://doi.gov.vic.au>.
- Keough, M. J. & Quinn, G. P. (1998). *Effects of periodic disturbances from trampling on rocky intertidal algal beds*. Ecological Applications 8: 141 - 161.
- Koehn, J. D. & O'Connor, W. G. (1990). *Biological information for management of native freshwater fish in Victoria*. Arthur Rylah Institute for Environmental Research, Department of Conservation & Environment, Victoria.
- KPMG (1996). *Western Port Development Corporation regional economic development strategy: Volume 1*. KPMG Management Consulting Pty, Ltd., Melbourne, Victoria.
- LCC (1991). *Melbourne Area District 2 Review Descriptive Report*. Land Conservation Council, Victoria.

- LCC (1991). *Rivers and streams special investigation: Final recommendations*. Land Conservation Council, Victoria.
- LCC (1993). *Marine and coastal special investigation descriptive report*. Land Conservation Council, Victoria.
- LCC (1994). *Sites with important biological and ecological values, marine and coastal special investigation internal report*. Land Conservation Council, Victoria.
- LCC (1995). *Marine and coastal special investigation proposed recommendations*. Land Conservation Council, Victoria.
- LCC (1996). *Marine and coastal special investigation: Draft final recommendations*. Land Conservation Council, Victoria.
- Light, B. R. & Woelkerling, W. J. (1992). *Literature and information review of the benthic flora of Port Phillip Bay, Victoria, Australia*. Port Phillip Bay Environmental Study, Commonwealth Scientific & Industrial Research Organisation, Melbourne.
- Lowe, M. (1999). *Sediment sources in Western port catchment*. Port Phillip & Western Port Catchment and Land Protection Board, Victoria.
- Loyn, R. H., Dann, P. & Bingham, P. (1994). *Ten years of waterbird counts in Western Port, Victoria, 1973 - 1983: Waterfowl and large wading birds*. Australian Bird Watcher 15: 333 - 350.
- Loyn, R. H., Dann, P. & McCulloch, E. (2001). *Important wader sites in the East Asian-Australasian Flyway: 1. Western Port, Victoria, Australia*. The Stilt 38: 39 - 53.
- Lumsden, L. (1992). *Sites of high conservation value for fauna within the Melbourne 2 - Study area*. Wildlife Branch, Department of Conservation & Environment, Victoria.
- Lunt, I. D. (1991). *Management of remnant lowland grasslands and grassy woodlands for nature conservation: a review*. Victorian Naturalist 108: 56 - 66.
- Marks, G. C., & Smith, I.W. (1991). *The Cinnamon Fungus in Victorian forests: History, distribution, management and control*. Department of Conservation and Environment, Victoria.
- McArthur, K. W. (1990). *The Briars - Mount Martha : Development of wetland and woodland ecosystems in the context of a major historical farm property*. In *Wetlands : Their ecology, function, restoration and management*. La Trobe University, Bundoora.
- McDonnell, M.J., Williams, N.S.G. & Hahs, A.K. (1999). *A reference guide to the ecology and natural resources of the Melbourne region. A bibliography of the biodiversity literature for scientists, teachers, policy makers, planners and natural resource managers*. Australian Research Centre for Urban Ecology, Royal Botanic Gardens, Melbourne, Victoria. Online at http://www.arcue.rbg.vic.gov.au/alt_pa_3b.htm.
- McMahon, A. R. G. (1993). *Flora and fauna*. In *Frankston coastline management study*. Report for Frankston City Council by Ecology Australia Pty. Ltd., Clifton Hill, Victoria.
- Melbourne Water (1998). *Health of waterways within the Port Phillip & Western Port catchments: Waterways report 1998*. Melbourne Water Corporation, East Richmond, Victoria.
- Melbourne Water (2001). *The Peninsula Project - Working towards a sustainable marine environment*. Melbourne Water Corporation, East Richmond, Victoria.
- Melbourne Water (2002). Website: <http://www.melbournewater.com.au>.
- Menkhorst, P. (1995). *Mammals of Victoria*. Oxford University Press, Melbourne.
- Menkhorst, P. *Field guide to Australian mammals*. Oxford University Press, Melbourne.
- Millsom, R. (1992). *BOCA Western Port survey, Victoria*. Bird Observer 717: 9 - 10.
- Monash University (1995). *Environmental report: conservation of roadsides and roadside vegetation*. Graduate School of Environmental Science, Monash University, Victoria.
- Morrees, A. & Molnar, C. (1992). *Sites of botanical significance in the Land Conservation Council Melbourne District 2 - study area*. Flora and Fauna Division, Department of Conservation and Environment, Victoria.

- Morris, P. & Werner, G. (2000).** *Victorian marine habitat database seagrass mapping of Western Port, 2000.* Marine and Freshwater Resources Institute, Queenscliff, Victoria.
- Muir, A. M., Tansley, M., Bezuijen, M.R., & Collinson, M.H. (1997).** *Frankston City Council Vegetation Study 1997.* Report for Frankston City Council by Ecology Australia Pty Ltd and AGC Woodward-Clyde Pty Ltd, Fairfield, Victoria.
- Mulvaney, J. & Kamminga, J. (1999).** *Prehistory of Australia.* Allen & Unwin, Sydney.
- MPSC (1999).** *Economic development strategy, 1999 – 2002.* Mornington Peninsula Shire Council, Victoria.
- MPSC (1999).** *Tourism Development and Marketing Plan, 1999.* Greater Peninsula Tourism, Mornington Peninsula Shire Council, Victoria.
- MPSC (2000).** *Mornington Peninsula Shire Community Profile - including forecasts 1996 to 2016.* Report for Mornington Peninsula Shire Council by i.d.Pty Ltd. Online at <http://www.mornpen.vic.gov.au>.
- MPSC (2001).** *Catchment Maps.* Mornington Peninsula Shire Council, Victoria. Online at <http://www.mornpen.vic.gov.au>.
- MPSC (2001).** *Strategic Planning Objectives.* Mornington Peninsula Shire Council, Victoria.
- MPSC (2001).** *A sustainability framework for Mornington Peninsula Shire.* Mornington Peninsula Shire Council, Victoria.
- MPSC (2001).** *Sustainable Peninsula.* Mornington Peninsula Shire Council, Victoria.
- MPVA (in press).** *Wine partnership draft code of practice.* Mornington Peninsula Vignerons Association, Red Hill South, Victoria.
- National Greenhouse Advisory Committee (1992).** *Grappling with greenhouse: understanding the science of climate change.* Commonwealth of Australia, Canberra.
- National Trust of Australia (Vic.). (2002).** *The National Trust register online.* Online at <http://www.nattrust.com.au>.
- Nicholson, V., PhD. thesis, (1995).** *Tourism on the Mornington Peninsula.* Department of Marketing, Monash University, Victoria.
- NRE (1995).** *Threatened fauna in Victoria.* Department of Conservation and Natural Resources, Victoria. Online at <http://www.nre.vic.gov.au>.
- NRE (1997).** *Victoria's biodiversity strategy.* Department of Natural Resources and Environment, Victoria.
- NRE (1999)a.** *Code of practice for farm chemical spray application.* Chemical Standards Branch, Department of Natural Resources and Environment, Victoria. Online NRE: Farming & Agriculture: Chemical standards: Home at <http://www.nre.vic.gov.au>.
- NRE (1999)b.** *Ramsar information sheet: Western Port site.* Department of Natural Resources & Environment, Victoria. Online at <http://www.nre.vic.gov.au>.
- NRE (1999)c.** *Victorian weeds strategy.* Department of Natural Resources and Environment, Victoria.
- NRE (2000)a.** *Flora information system database 2000.* Arthur Rylah Institute of Environmental Research, Heidelberg, Victoria.
- NRE (2000)b.** *Rare or threatened vascular plants in Victoria - 2000.* Department of Natural Resources & Environment, Victoria. Online at <http://www.nre.vic.gov.au>.
- NRE (2000)c.** *Threatened vertebrate fauna in Victoria 2000; A systematic list of vertebrate fauna considered extinct, at risk of extinction or in major decline in Victoria.* Department of Natural Resources & Environment, Victoria. Online at <http://www.nre.vic.gov.au>.
- NRE (2000)d.** *Victorian wildlife atlas database.* Department of Natural Resources and Environment, Victoria.
- NRE (2000)e.** *Flora information system database.* Department of Natural Resources and Environment, Victoria.
- NRE (2000)f.** *Restoring our catchments: Victoria's draft native vegetation management framework.* Department of Natural Resources and Environment, Victoria. Online at <http://www.nre.vic.gov.au>.
- NRE (2000)g.** *Wetland database.* Arthur Rylah Institute of Environmental Research; Department of Natural Resources and Environment, Victoria. Online at <http://www.vic.gov.au>.

- NRE (2000)h.** *Salinity management in Victoria*. Department of Natural Resources and Environment, Victoria. Online at <http://www.nre.vic.gov.au>
- NRE (2000)i.** *Victorian draft native vegetation management framework*. Department of Natural Resources and Environment, Victoria. Online at <http://www.nre.vic.gov.au>
- NRE (2001)a.** *Farm Dams (Irrigation) Draft Report: Executive summary*. Department of Natural Resources & Environment, Victoria. Online at <http://www.nre.vic.gov.au>.
- NRE (2001)b.** *Information sheets:Threatened Species*. Department of Natural Resources & Environment, Victoria. Online at <http://www.nre.vic.gov.au>.
- NRE (2001)c.** *Native Vegetation*. Department of Natural Resources and Environment, Victoria. Online at <http://www.nre.vic.gov.au>.
- NRE (2002).** *Fishing and Aquaculture: Marine species database*. Department of Natural Resources & Environment, Victoria. Online at <http://www.nre.vic.gov.au>.
- NRE (2002).** *Website of the Department of Natural Resources & Environment*. Includes a wide range of items including agricultural and conservation issues relevant to this proposal. Online at <http://www.nre.vic.gov.au>.
- OCE (1991).** *1991 State of the environment report : Agriculture and Victoria's Environment - Resource Report*. Office of the Commissioner for the Environment, Melbourne, Victoria.
- Oceanics Australia (2001).** *Mornington Peninsula Shire Council Stormwater Management Plan - Detailed threats and values*. Report for Mornington Peninsula Shire Council by Oceanics Australia.
- O' Hara, T.D. (1995).** *Marine invertebrate conservation at San Remo*. Victorian Naturalist **112**: 50 - 53.
- O'Hara, T.D. (1996).** *Out of sight, out of mind: Safeguarding our marine environment*. The Environment Papers **13**: 1 - 30.
- O'Hara, T.D. & Barmby, V. (2000).** *Victorian marine species of conservation concern: Molluscs, echinoderms, and decapod crustaceans*. Parks, Flora and Fauna Division, Department of Natural Resources and Environment, Victoria.
- Parks Victoria (2000).** *State of the Parks 2000*. Parks Victoria, Department of Natural Resources and Environment, Victoria.
- Parks Victoria (2002).** *Western Port Ramsar Site: Draft Strategic Management Plan*. Parks Victoria, Department of Natural Resources and Environment, Victoria.
- Parliament of Victoria (1998).** *Report on Weeds in Victoria: May 1998*. Environment and Natural Resources Committee, Parliament of Victoria. Government Printer: Melbourne.
- Port Phillip CALP Board (2000).** *Draft Port Phillip and Westernport native vegetation plan*. Port Phillip Catchment & Land Protection Board, Department of Natural Resources and Environment, Victoria.
- Porter, C. (1997).** *Subtidal reef areas in Victoria's central marine biophysical region: Identification, assessment and documentation of significant sites for nomination to the register of the National Estate*. Victorian National Parks Association and Australian Marine Conservation Society, Victoria.
- Povey, A. & Keough, M.J. (1991).** *Effects of trampling on plant populations on rocky shores*. Oikos **61**: 355 - 368.
- Presland, G. (1994).** *Aboriginal Melbourne: The lost land of the Kulin People*. McPhee Gribble, Melbourne.
- RAC (1992).** *Coastal zone enquiry - Background paper April 1992*. Resource Assessment Commission, Commonwealth of Australia. Australian Government Publishing Service, Canberra.
- RAC (1992).** *Coastal zone enquiry: Draft report*. Resource Assessment Commission, Commonwealth of Australia. Australian Government Publishing Service, Canberra.
- RAC (1993).** *Coastal zone inquiry: Victorian case study: coastal management and decision making processes in the Westernport region*. Resource Assessment Commission, Commonwealth of Australia. Australian Government Publishing Service, Canberra.
- RAC (1993).** *Coastal Zone Inquiry: Final report overview*. Resource Assessment Commission, Commonwealth of Australia. Australian Government Publishing Service, Canberra.

- Rasmussen, M. (2000).** *Environmental legislation affecting the Australian wine industry.* The Australian Grapegrower & Winemaker (August): 61 - 62.
- Ratio Consultants (1995).** *Warrigine Heritage park open space management plan – June 1995.* Report prepared for Mornington Peninsula Shire Council, Victoria by Ratio Consultants Pty Ltd & Biosis Research Pty Ltd., Melbourne, Victoria.
- Ratio Consultants (1999).** *Balcombe Estuary master plan - October 1999.* Report prepared for Mornington Peninsula Shire Council, Victoria by Ratio Consultants Pty Ltd, Biosis Research Pty Ltd, & Streamline Research, Melbourne, Victoria.
- Ross, J. H. (1990).** *A census of the vascular plants of Victoria.* Department of Conservation, Forests and Lands, Victoria.
- Ross, R. (2000).** *Mangroves and salt marshes in Western Port Bay, Victoria.* Arthur Rylah Institute of Environmental Research, Heidelberg, Victoria. Online NRE: Coasts & Marine: Bays, Inlets, Estuaries & Lakes: Western Port Bay at <http://www.nre.vic.gov.au>.
- SASNRM (1994).** *From Melbourne to Mornington - a survey of the vertebrate fauna in parks and reserves.* Melbourne, School of Aquatic Science and Natural Resources Management, Deakin University, Victoria.
- Shire of Hastings (1994).** *Shire of Hastings Conservation Strategy, 1994.* Cowley, A., (ed.), Shire of Hastings, Victoria. South East Water website: <http://www.southeastwater.com.au>.
- Standards Australia AS/NZS ISO 14001:** *Environmental management systems- Specification with guidance for use.* Australian Standards. Standards Australia, Melbourne, Victoria.
- Standards Australia AS/NZS ISO 14004:** *Environmental management systems - general guidelines on principles, systems and supporting techniques.* Standards Australia, Melbourne, Victoria.
- Strickland, K. M. & Strickland, P. (1992).** *Peninsula plants: a field guide to the indigenous plants of the Mornington Peninsula suitable for cultivation.* Kareelah Bush Nursery, Balnarring, Victoria.
- Stoneham, G., Crowe M., Platt, S., Chaudri, V., Soligo, J. & Strappazzon, L. (2000).** *Mechanisms for biodiversity conservation on private land.* Department of Natural Resources and Environment, Victoria.
- Taylor, R. (1999).** *Wild places of greater Melbourne.* CSIRO Publishing, Collingwood, Victoria.
- Thackway, R. & Cresswell, I. (1995).** *An interim biogeographic regionalisation for Australia.* Australian Nature Conservation Agency, Canberra.
- Tourism Victoria (1996).** *Victorian regional travel and tourism survey.* Tourism Victoria, Melbourne, Victoria.
- Tourism Victoria (2002).** Online at <http://www.visitvic.vic.gov.au>.
- Traill, B. & Porter, C. (2001).** *Nature conservation review Victoria 2001.* Victorian National Parks Association, Victoria.
- Tunbridge, A., Simmons, D., & Adams, R. (2000).** *Allelopathic effects of Sweet Pittosporum Pittosporum undulatum Vent. on the germination of selected native plant species.* The Victorian Naturalist **117(2)**: 44-50.
- Urban Enterprises (1999).** *Greater peninsula tourism: The value of tourism to the Mornington Peninsula economy.* Report for Mornington Peninsula Shire Council by Urban Enterprises Pty Ltd, Melbourne.
- Urban Enterprises (2000).** *Mornington Peninsula tourism: The health of tourism on the Mornington Peninsula 1999/2000.* Report for Mornington Peninsula Shire Council by Urban Enterprises Pty Ltd, Melbourne.
- Urban Enterprises (2000).** *Mornington peninsula tourism: Tourism indicators for the Mornington Peninsula.* Report for Mornington Peninsula Shire Council by Urban Enterprises Pty Ltd, Melbourne.
- Van Polanen Petel, T. D. (2000).** *The value of urban bush remnants as bird habitat.* Department of Biological Sciences, Monash University, Melbourne.
- VCC (2002).** *Victorian coastal strategy.* Victorian Coastal Council, Victoria.
- VIMS (1996).** *Western Port coastal resource atlas incorporating the Mornington Peninsula.* Victorian Institute for Marine Science, for the Victorian National Plan Marine Pollution Committee, Victoria.
- VNPA (1997).** *Victoria's national parks - The next century.* Victorian National Parks Association, Melbourne, Victoria.

Walker, G., & Gilfedder, M. (1999). *Effectiveness of current farming systems in the control of dryland salinity.* Commonwealth Scientific & Industrial Research Organisation, Canberra.

Walker, M. A. (1993). *The soil seed bank in heathland and its implications for regeneration.* Faculty of Science and Technology, Deakin University, Melbourne.

Wallis, R. L., & Brunner, H. (1996). *Diet of Red Foxes and Cats: Their impact on fauna living in parks near Melbourne.* The Victorian Naturalist **113(6)**: 300-305.

Walsh, N.G. & Foreman, D.B. (eds.) (1993). *Use of Victorian Plants by Koories.* In *Flora of Victoria Volume 1: Introduction.* Inkata Press, Melbourne.

Williams, N.S.G. & Molnar, C.D. (1997). *Botanical assessment of the northern section of Greens Bush, Mornington Peninsula National Park.* Flora Research and Assessment, Department of Natural Resources and Environment, Heidelberg, Victoria.

Winstanley, R. (1996). *Issues in the Victorian marine environment.* In *The state of the marine environment report for Australia,* Technical annex 3: State and territory issues. L.P. Zann & D. C. Sutton (eds.). Commonwealth of Australia, Canberra.

WRPCC (1992). *Western Port Bay strategy.* Westernport Regional Planning & Coordination Committee, Victoria.

Zelman, M. (1993). *Port Phillip - Western Port regional Landcare plan.* The Landcare Regional Reference Group, Landcare, Victoria.

Zelman, M. (1993). *Draft- Towards sustainable land use, Port Phillip - Westernport regional landcare plan, February 1993.* Landcare, Victoria.

ABBREVIATIONS:

AHC: Australian Heritage Commission

ANZECC: Australian and New Zealand Environment and Conservation Council

ARI: Arthur Rylah Institute for Environmental Research

BOCA: Bird Observers Club of Australia

CALP: Catchment and Land Protection Board

CSIRO: Commonwealth Scientific and Industrial Organisation

Cwlth: Commonwealth of Australia / Federal Government of Australia

DCE: Department of Conservation and Environment, Victoria (now NRE)

DOI: Department of Infrastructure, Victoria

ECC: Environment Conservation Council ,Victoria (previously LCC)

EPA: Environment Protection Authority, Victoria

EPBC: Environment Protection & Biodiversity Conservation

ERA: Environmental Resources of Australia Pty, Ltd.

ESS: Environmental Studies Series

IMCRA: Interim Marine and Coastal Regionalisation for Australia

KTRI: Keith Turnbull Research Institute

LCC: Land Conservation Council, Victoria

MAFRI: Marine and Freshwater Resources Institute

MPSC: Mornington Peninsula Shire Council

MPVA: Mornington Peninsula Vignerons Association

NRE or DNRE: Department of Natural Resources and Environment, Victoria

OCE: Office of the Commissioner for the Environment, Victoria

RAC: Resource Assessment Commission (Cwlth)

VCC: Victorian Coastal Council

VIAS: Victorian Institute of Animal Science

Vic: State of Victoria

VIMS: Victorian Institute of Marine Science

WPCC: Western Port Catchment Co-ordinating Group

WPRPA: Western Port Regional Planning Authority