Prepared by the Western Coastal Board with assistance from Chris Harty Planning and Environmental Management, the Central West Victoria Coastal & Marine Planning Program Steering Committee and Margie Morrice for:

Borough of Queenscliffe
City of Greater Geelong
Surf Coast Shire
Colac Otway Shire
Western Coastal Board
Department of Sustainability and Environment
Parks Victoria
Corangamite Catchment Management Authority
National Oceans Office
Department of Primary Industries

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Chris Harty

OTHER PHOTOGRAPHS
Chris Harty, Margie Morrice and Jon Breedveld

GRAPHIC DESIGN
Propellant

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Printed on recycled paper
The development of the Central West Victoria Estuaries Coastal Action Plan has involved the collective effort of many dedicated people within the community of the Central West Region. In particular members of the Central West Victoria CMPP Steering Committee, Reference Group and working groups have worked hard to articulate the issues and initiatives documented here. Appreciation to the consultant Chris Harty who prepared the CAP. Special thanks also to Jon Breedveld and Julie Woodruff of the Surf Coast Shire. Last but not least to all individuals and groups in the community of the Central West Victoria coast.

LIST OF ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>BC</td>
<td>Barwon Coast Committee of Management</td>
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<tr>
<td>BQ</td>
<td>Borough of Queenscliffe</td>
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<td>BW</td>
<td>Barwon Water</td>
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<td>CAP</td>
<td>Coastal Action Plan</td>
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<td>CCB</td>
<td>Central Coastal Board</td>
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<td>CCMA</td>
<td>Corangamite Catchment Management Authority</td>
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<td>CMA</td>
<td>Catchment Management Authority</td>
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<td>CMPP</td>
<td>Coastal and Marine Planning Program</td>
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<td>COM</td>
<td>Committee of Management</td>
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<td>COGG</td>
<td>City of Greater Geelong</td>
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<td>COS</td>
<td>Colac Otway Shire</td>
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<tr>
<td>DDO</td>
<td>Design and Development Overlay</td>
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<tr>
<td>DPI</td>
<td>Department of Primary Industries</td>
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<tr>
<td>DSE</td>
<td>Department of Sustainability and Environment</td>
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<tr>
<td>DVC(AAV)</td>
<td>Department of Victorian Communities (Aboriginal Affairs Victoria)</td>
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<tr>
<td>DVC(SR)</td>
<td>Department of Victorian Communities (Sport and Recreation Victoria)</td>
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<td>EA</td>
<td>Environment Australia</td>
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<td>EMO</td>
<td>Erosion Management Overlay</td>
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<td>EPA</td>
<td>Environment Protection Authority</td>
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<td>ERZ</td>
<td>Environmental Rural Zone</td>
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<td>ESD</td>
<td>Ecologically Sustainable Development</td>
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<tr>
<td>ESO</td>
<td>Environmental Significance Overlay</td>
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<td>GEC</td>
<td>Geelong Environment Council</td>
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<td>GOT</td>
<td>Geelong Otway Tourism</td>
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<td>GT</td>
<td>Gordon Technical and Further Education College</td>
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<td>GORC</td>
<td>Great Ocean Road Coast Committee</td>
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<td>ICZM</td>
<td>Integrated Coastal Zone Management</td>
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<tr>
<td>LSIO</td>
<td>Land Subject to Inundation Overlay</td>
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<tr>
<td>MOU</td>
<td>Memorandum of Understanding</td>
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<tr>
<td>NLWR</td>
<td>National Land and Water Resources</td>
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<tr>
<td>PCRZ</td>
<td>Public Conservation and Resource Zone</td>
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<td>PPRZ</td>
<td>Public Park and Recreation Zone</td>
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<td>PV</td>
<td>Parks Victoria</td>
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<td>RUZ</td>
<td>Rural Zone</td>
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<td>SCS</td>
<td>Surf Coast Shire</td>
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<td>SEPPs</td>
<td>State Environment Protection Policies</td>
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<td>SLO</td>
<td>Significant Landscape Overlay</td>
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<td>SPPF</td>
<td>State Planning Policy Framework</td>
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<td>SUZ</td>
<td>Special Use Zone</td>
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<td>TPR</td>
<td>Torquay Public Reserves</td>
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<td>TV</td>
<td>Tourism Victoria</td>
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<td>TZ</td>
<td>Township Zone</td>
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<td>VCS</td>
<td>Victorian Coastal Strategy</td>
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<td>VR</td>
<td>Vic Roads</td>
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<td>WAC</td>
<td>Wathaurong Aboriginal Cooperative</td>
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<td>WCB</td>
<td>Western Coastal Board</td>
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<tr>
<td>WMO</td>
<td>Wildfire Management Overlay</td>
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Implementing The Victorian Coastal Strategy—Coastal Action Plans

The Victorian Coastal Strategy, developed in accordance with the Coastal Management Act 1995, establishes the overall framework for planning and management of the Victorian coast. Through the Strategy, Government is providing leadership to ensure that Victoria's coastal and marine environment will continue to be well managed and used by present and future generations.

Coastal Action Plans (CAPs), also developed in accordance with the Coastal Management Act 1995, provide a key mechanism for the implementation of the Strategy. CAPs enable the broad principles and priorities identified in the Strategy to be further developed and applied at a sub-regional or issue based level. They provide strategic direction for the future management of an area of coast by identifying necessary priorities, actions and outcomes.

Following completion of a draft CAP, the Regional Coastal Board refers the draft plan to the Victorian Coastal Council for approval. Subject to approval, Council then refers the plan to the Minister for Environment for endorsement and formal notification through the Government Gazette.

Diane James
Chair

THE VICTORIAN COASTAL STRATEGY 2002 (VCS)
• provides strategic direction for planning and management of the whole coast;
• was developed by the Victorian Coastal Council and approved under the Coastal Management Act 1995; and
• integrates State, National and International principles and policies for the coast.

COASTAL ACTION PLANS (CAPs)
• enable the broader principles and priorities of the VCS to be further developed and applied at a regional or local level, or for particular issues;
• are consistent with the VCS and play a key role in its implementation;
• take a long term strategic view, clarify directions for future use and identify key actions required to achieve preferred outcomes;
• are developed by or under the guidance of Regional Coastal Boards;
• involve public consultation during preparation; and
• are referred to the Victorian Coastal Council for approval prior to referral by the Council to the Minister for Environment for endorsement.

MANAGEMENT PLANS
• provide direction for day to day management of an area of coast by appointed managers;
• include a business plan which outlines management requirements, proposed works and budget priorities;
• are developed by coastal managers in accordance with the Coastal Management Act 1995;
• must be consistent with the VCS, CAPs and relevant legislation; and
• are approved by the Minister for Environment.
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The Central West Victoria Estuaries Coastal Action Plan was prepared in partnership through the Central West Victoria Coastal and Marine Planning Program (CMPP) and funded by the Natural Heritage Trust, CMPP partners and the Corangamite Catchment Management Authority.

The Central West Region (Moonlight Head to Point Lonsdale) contains a number of estuaries that are important for a range of environmental, social and economic reasons ranging from fishing, swimming and tourism to estuarine wetlands supporting wildlife and birdlife. The estuaries between Moonlight Head and Point Lonsdale are:

- Johanna River
- Aire River
- Barham River
- Wild Dog Creek
- Skenes Creek
- Grey River
- Kennett River
- Wye River
- Separation Creek
- Cumberland River
- St George River
- Erskine River
- Moggs Creek
- Painkalac Creek
- Anglesea River
- Spring Creek
- Thompsons Creek
- Barwon River

This document establishes a planning and management framework that will improve the protection of estuary values through integrated management planning. It is based on the principles of integrated coastal management, the Victorian Coastal Strategy 2002, ecological sustainability, capacity building and community empowerment. It supports the:

- integrated planning of estuaries;
- sustainable management of estuaries and their protection;
- improvement of skills and understanding of estuary ecology and functioning;
- effective and active participation of all sectors of the community in partnership with local and state government;
- conservation of the aesthetic values of estuaries and wetlands; and
- prevention of further degradation and repair to the damage of estuaries.

The outcome expressed for estuaries in this region is that they are protected and restored, and used sustainably in a cooperative and consistent management approach.

This Central West Victoria Estuaries CAP will be implemented through a number of statutory, cooperative and resourcing mechanisms. Development and implementation of this document focuses on a partnership approach.

Agencies responsible for implementing actions have also been requested to indicate what resources they have already allocated. An evaluation framework has been developed to assist the Western Coastal Board to report on the success of this document in improving outcomes for the region's estuary values. This plan will be reviewed in 2007 alongside the Central West Victoria Regional CAP. This timeline and review process will ensure close alignment of all actions along the coast.
1. Background

**Estuaries** – semi-enclosed coastal bodies of water where freshwater mixes with saltwater. These can be called bays, inlets, river mouths, mudflats, wetlands, mangroves, saltmarshes and reed beds.

### 1.1 THE NEED FOR A REGIONAL ESTUARIES COASTAL ACTION PLAN

The estuaries located along the Central West coast of Victoria between Moonlight Head and Point Lonsdale (Figure 1) represent important values to Victorians generally, and local communities. Estuaries are the meeting place of the rivers and the sea, and represent a unique ecosystem containing plants and animals that are specially adapted to living in this environment. Because estuaries are located at the end of rivers and streams they also act as a ‘report card’ about the health and quality of the catchment to which they belong.

Past planning and management of these estuaries has not been well coordinated or integrated by existing legislative and policy mechanisms, to ensure estuaries are managed on a sustainable basis. Much of this is due to the ambiguous roles and responsibilities for managing estuaries across government agencies and community, and lack of clear strategic direction for estuary management on a State and/or regional level. There are so many government agencies making decisions and undertaking activities that affect estuaries that it could be said that they are under the management of almost everyone, but under the effective guardianship of no one (PPK Environment & Infrastructure 2001a, Brett Lane & Associates 2001).

Estuaries require special attention and management, which reflects their unique character, to ensure that they are protected and sustainably managed for the future. The preparation of the **Central West Victoria Estuaries CAP** has been supported by all levels of government from the Commonwealth and State governments through to the regions, local government and the community. This wide and coordinated planning process has been supported through the Coastal and Marine Planning Program (CMPP) (see Section 1, Western Coastal Board 2002a). The Central West Victoria CMPP and its Steering Committee (Appendix 3) undertook an extensive regional assessment of coastal and marine issues, with estuary management coming out as a high priority. The key mechanism to enable integrated planning is the development of Coastal Action Plans.

In summary, this document has been developed in response to a need to provide an overall and integrated strategic planning framework to improve the quality, consistency and efficiency of planning and management decisions for estuaries. It will also provide a framework and important guide for the preparation of future estuary management plans, which will work to understand, and protect and improve the health of estuaries in this region.

The **Central West Victoria Regional CAP 2002** provides strategic assessment and actions addressing a range of coastal and marine issues across the region, including estuaries. The **Central West Victoria Estuaries CAP** sits alongside the **Central West Victoria Regional CAP** and provides focussed strategic direction to protect and improve the management of estuaries.

The **Central West Victoria Estuaries CAP** was prepared with the assistance of the Corangamite Catchment Management Authority (CCMA), Healthy Waterways Incentive Program and the Commonwealth Government’s Natural Heritage Trust. It was developed under the requirements of the **Coastal Management Act 1995**, as well as a number of key policy and legislative initiatives (Appendix 4) related to managing estuaries – for example the **Draft Corangamite River Health Strategy 2004** (prepared by CCMA) and the **South West Victoria Estuaries CAP** (Western Coastal Board 2002b). These linkages ensure that this document provides coordinated planning for estuaries for catchment, riverine and coastal processes, and across key estuary planning and management authorities such as the Western and Central Coastal Boards and the Corangamite Catchment Management Authority.

In summary, this document has been developed in response to a need to provide an overall and integrated strategic planning framework to improve the quality, consistency and efficiency of planning and management decisions for estuaries. It will also provide a framework and important guide for the preparation of future estuary management plans, which will work to understand, and protect and improve the health of estuaries in this region.
1.2 THE COASTAL AND MARINE PLANNING FRAMEWORK

1.2.1 WHO IS INVOLVED IN COASTAL MANAGEMENT?
Management of Victoria’s coastal and marine areas, including estuaries, is shared between Commonwealth, State and local governments (PPK Environment & Infrastructure 2001a, Brett Lane & Associates 2001, Victorian Coastal Council 2002). A variety of agencies implement a range of legislation and have responsibility for planning, management and approval of onshore and offshore activities. There are also a number of international and national agreements, conventions and strategies that need to be observed and respected (Morrice 2000).

The broad policy context for coastal planning and management across all levels is illustrated in Figure 2.

The Commonwealth Government is responsible for waters beyond three nautical miles from low water mark of the Victorian coast. It ensures that Australia meets it obligations under international agreements and co-ordinates policy, programs (eg. Coasts and Clean Seas Program and the CMPP) and on-ground activities through Natural Heritage Trust funding.

The Natural Heritage Trust has also funded the National Land and Water Resources (NLWR) Research and Development Corporation to undertake an audit and assessment of Australian estuaries. This program aims to classify estuaries around Australia by condition and key ecological processes. It will use this information to develop guidelines and highlight information gaps to assist planning and management authorities with improved management of estuaries.

The Australian Estuaries: A Framework for Management (Smith et al. 2001) has identified the following key findings:

- Estuary management approaches are highly variable with limited use of scientific knowledge.
- Key individuals (champions) are crucial to highlight attention on improving estuary management.
- The Australian community is poorly informed and feels apathetic about estuary issues.
- Estuary planning and legislation is fragmented with no national management standards or objectives.
- Increased training for estuary managers and community education programs would develop greater cooperation between coastal management organisations.
- The Commonwealth Government, in partnership with the states, needs to establish improved management programs for estuaries and provision of financial assistance for priority protection, restoration and planning projects.

Committees of management have a role as day to day delegated managers of Crown land reserves including parts of some estuaries. They also have roles in estuary management, including in some cases preparation of management plans where needed. A review and reform of coastal committees of management in both the Colac Otway Shire and Surf Coast Shire regions has been completed and new skills based committees are now in place in Apollo Bay-Kennett River, Wye River and the Surf Coast.

Local government is responsible for managing land use planning, building control, approval of waste disposal systems on private land, provision and maintenance of stormwater drainage systems and provision and maintenance of road access within municipal council areas. In the Central West Region, the planning schemes of the four municipalities extend to low water mark for Queenscliffe and Colac Otway, and to 100m and 600m seaward of low water mark for Greater Geelong and Surf Coast respectively. The land use planning responsibilities of some of these councils therefore extend over the near shore waters beyond the municipal boundary.

Interest groups such as Coast Action/Coastcare and Landcare groups have a role in coastal management. These groups are involved in a range of activities including revegetation, dune protection, public awareness and education and local area planting. These groups rely on voluntary input from interested people in the wider community and are a critical element in implementing management activities. Industry groups also have an important role in day-to-day management of resource use, and in resourcing planning and on-ground works.

The delineation of some roles and responsibilities for the planning and management of catchments and coasts in the Central West Region has been unclear. However, the release of the Corangamite Regional Catchment Strategy and the draft Corangamite River Health Strategy has provided a framework which better links management between catchments and the coast. Both strategies better recognise the importance of estuaries and the need for improved and coordinated management of estuaries as part of broader catchments.

1.2.2 PLANNING AND MANAGEMENT FRAMEWORK OF THE CENTRAL WEST REGION

The planning and management framework of the Central West Region is made up of a number of key agencies responsible for:

- The ownership of the land or waters
- The management of the land or waters
- Planning the way in which land or waters are to be used
- Regulating activities on land and waters

To understand the planning and management framework, it is important to distinguish between who owns the asset, who is charged with direct management of the land or waters, and who is responsible for planning and regulating the way in which land or waters can be used at a local, state or regional level. The role and activities of the various agencies involved in coastal and marine planning and management depend upon their function as an owner, manager, planner or regulator.

The planning, management and regulatory framework for the Central West Region is shown conceptually in Figure 3.
| INTERNATIONAL | 1992 UN Rio Earth Summit  
| Treaties  
| Conventions such as Ramsar  
| Agreements (JAMBA, CAMBA) |
| NATIONAL / COMMONWEALTH | Inter Governmental Agreement on the Environment  
| Biodiversity Strategy  
| Australia’s Oceans Policy  
| National Strategy for Ecologically Sustainable Development  
| Environment Protection and Biodiversity Conservation Act 1999  
| Other Commonwealth legislation that support these policy documents. |
| STATE | Victorian Coastal Strategy  
| Victorian Biodiversity Strategy  
| Victorian River Health Strategy  
| Siting and Design Guidelines for Structures on the Victorian Coast and Landscape Setting Types  
| State Environment Protection Policies  
| Victorian Environmental Assessment Council and Environment Conservation Council Recommendations  
| Victorian Vegetation Framework  
| Fisheries Management Plans  
| State legislation that support these policy documents |
| REGIONAL | Great Ocean Road Region Strategy  
| Corangamite Catchment Strategies and Plans  
| Regional Vegetation Plan  
| Regional Coastal Action Plans |
| LOCAL | Park and Reserve Management Plans  
| Conservation Management Plans  
| Local Coastal Action Plans  
| Planning Schemes |
1.2.3 KEY PLANNING TOOLS
Coastal and marine planning and management is achieved through a variety of mechanisms including legislation, regulations and by-laws, planning policies, strategic plans, management plans and planning schemes.

The key implementation tools that underpin the coastal planning and management system in Victoria and Central West Victoria are shown in Figure 4. Although coastal management is the primary driver, the framework is essentially a combination of coastal management, land use planning, and the regional catchment management framework.

Coastal Management Act and Victorian Coastal Strategy
The Coastal Management Act 1995 (The Act) establishes legislation for coordinated strategic coastal planning in Victoria. The Act established the Victorian Coastal Council and the three Regional Coastal Boards. The Western Coastal Board covers the area from the South Australian border to Bream Creek north of Torquay covering a majority of the Central West Region.

The Act also provided for the preparation of the Victorian Coastal Strategy (VCS), CAPs and management plans. The VCS establishes the framework for the long term sustainable management of coastal and marine areas in Victoria. The VCS provides the following hierarchy of principles to guide decision making:

• provide for the protection of significant environmental features;
• ensure the sustainable use of natural coastal resources;
• undertake integrated planning and provide direction for the future; and
• when the above principles have been met, facilitate suitable development on the coast within existing modified and resilient environments where the demand for services is evident and requires management.

Protection of Significant Environmental Features is about the conservation of biological diversity, physical diversity and ecological integrity or the preservation and maintenance of essential ecological processes and life support systems. Aboriginal and other sites of cultural, historic or scientific value will also be protected.

Sustainable Use of Natural Coastal Resources is about ensuring inter-generational equity, that is, meeting the needs of people today without compromising the needs of future generations.

Direction for the Future is about providing integrated coastal zone planning and management which has regard to the economic, social and environmental implications of decisions and takes a long rather than short term view when making those decisions.

Suitable Development on the Coast are those coastal dependent activities and structures which provide an economic, social and/ or environmental benefit, enhancing the community’s value of the coast. Suitable coastal development can be from small-scale infrastructure, such as boardwalks and picnic tables, through to larger scale developments, such as major visitor centres, maritime related industry and recreation and water access infrastructure.

The Victorian Coastal Strategy 2002 expresses an objective and actions that specifically relate to estuaries as follows:

**Objective:** Protect and improve the condition of estuarine biological diversity

**Actions:**
- Opportunities will be actively sought to provide adequate environmental flows to estuaries through the Victorian Environmental Flows program that encompasses the Surface Water Allocation process, the Stressed Rivers program and general catchment management planning processes.
- Opportunities will be actively pursued to better understand ecological processes and determine and address key management requirements in enclosed marine waters (eg: Gippsland Lakes, Western Port, Environmental Management Plan for Port Phillip Bay) and other major estuaries.
- A strategic approach to protecting and improving the condition of coastal and estuarine wetlands, including mangrove, seagrass and saltmarsh areas, will be developed.
- Best practice guidelines for the management of estuarine mouth openings will be developed, incorporating environmental, social and economic issues.

Other Strategies and Policy
Other key strategies and policies are described here and a summary of additional strategies, policies and legislation affecting estuaries is provided in Appendix 4.

The Great Ocean Road Regional Strategy provides a framework for managing future growth and development. A key focus of the strategy is to protect significant landscapes and to ensure effective protection of estuaries as important links between catchments and the coast.

The Catchment and Land Protection Act 1994 establishes Catchment Management Authorities and the management and planning framework for regional catchments including estuaries in Victoria. The coastal and marine areas of the Central West Region form part of the Corangamite catchment. Regional Catchment Strategies are the primary integrated planning framework for land, water and biodiversity in the catchment region. They are therefore the overarching strategic document under which are nested the various action plans and strategies of the region.

A key document developed as part of a suite of plans under the Regional Catchment Strategy is the Draft Corangamite River Health Strategy. The Strategy provides an important link between estuaries and their catchments and focuses on the impacts of activities in the catchment as they affect the environmental condition and health of estuaries. It provides an important policy and implementation support mechanism for estuary management within the region.

This document addresses issues and lists objectives that are closely linked with beneficial uses outlined in the State Environment Protection Policy – Waters of Victoria, June 2003 (SEPP). For example, an estuary CAP talks about protecting and improving water quality and protection of habitat. The objectives and indicators of the SEPP sets the basis for protection of water environments and their associated beneficial uses through improvement of environmental quality and attainment of environmental quality objectives. The SEPP framework could assist in plan development when identifying issues, prioritising actions and monitoring attainment of actions.
FIGURE 3. COASTAL OWNERS, PLANNERS, MANAGERS & REGULATORS (ADAPTED FROM MAUNSELL MCINTYRE 2000; AND FIGURE 2, VICTORIAN COASTAL STRATEGY 2002)

* Committees of Management include municipal councils, Dept. Sustainability and Environment, Parks Victoria and locally appointed committees.
One priority of the auditing system proposed in the SEPP is to conduct research to increase the understanding of environmental quality and actions required to protect beneficial uses in objective setting for lakes, wetlands and estuaries. The auditing system will assist in monitoring progress towards protection of beneficial uses and identifying areas for further improvement.

**Coastal Action and Management Plans**

Coastal Action Plans are intended to be key strategic regional planning tools to implement the VCS for an area or to address a particular issue. They provide for detailed planning of an area to provide for protection and enhancement of significant features, including the marine environment, while facilitating recreational use and tourism. They provide the basis for coordination of the management and decision making activities of all coastal managers and stakeholders. They also provide for coordinated planning of coastal Crown land and where appropriate, freehold land.

Management plans for coastal and marine areas are prepared for specific areas of public land throughout the region by a variety of land managers, generally under heads of power established in the _Coastal Management Act 1995_, _Fisheries Act 1995_, _Crown Land (Reserves) Act 1978_ or _National Parks Act 1975_. Management plans prepared under the _Coastal Management Act 1995_ are required to be consistent with the VCS and relevant legislation and CAPs for that area. They set out the detailed management of a particular area and include a site specific works program and a business plan. (For a list of existing plans see References in Appendix 1.)

This document aims to link state policy relating to estuaries with estuary management plans and local planning schemes. This will ensure that actions recommended in individual estuary management plans are implemented in a coordinated manner through these strategies and planning instruments.

Estuary management plans prepared under this plan will provide for the protection of estuaries through the refinement of planning policies under local municipal planning schemes, and the identification of specific on-ground works. They provide the opportunity to address common issues as well as particular circumstances with each system. They should at best reflect the agreed position, and at least reflect the majority consensus of regulatory authorities and interested parties in relation to future nature conservation, rehabilitation and development of the estuary.

**Planning Provisions**

The land use planning system in Victoria is established by the _Planning and Environment Act 1987_. It provides for the preparation of municipal planning schemes to provide the strategic planning policy and statutory control over the use, development and protection of public and private land in a municipality. In most cases, local government is the designated planning authority for preparation and implementation of planning schemes.

The Victorian Planning Provisions are the basis upon which all planning schemes in Victoria are prepared, and they contain a consistent statewide set of planning provisions including the State Planning Policy Framework (SPPF). This SPPF gives effect to and provides a policy link with the VCS and Coastal Action Plans.

The Victorian Civil and Administrative Appeals Tribunal (VCAT) is the administrator in disputes between proponents and planning authorities and third parties.

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**FIGURE 4: KEY ELEMENTS OF THE COASTAL MANAGEMENT SYSTEM IN VICTORIA**

- Catchment and Land Protection
- Planning & Environment Act 1987
- Regional Catchment Strategies
- Victorian Coastal Strategy
- Victorian Planning Provisions
- Catchment Action Plans
- Coastal Action Plans, Management Plans
- Planning Schemes
1.3 SETTING THE SCENE

The Central West Victoria Estuaries CAP brings together a regional planning and management framework and structure, with recommendations for actions for improved integrated planning and management of estuaries within the Central West Region. It also reviews the application of estuary planning policy, zones and overlays for the Greater Geelong, Surf Coast and Colac Otway Planning Schemes, and recommends improvements for better quality planning of estuaries. This document also provides a toolkit to assist with individual estuary management plans, assessment of development proposals and day to day management.

1.3.1 OBJECTIVES

The Central West Victoria Estuaries CAP aims to:

• establish a framework for the management of estuaries, including a prioritised list of estuaries needing management planning;
• establish principles for good estuary management;
• promote links and integration between the management of estuaries, their catchments and the marine environment;
• introduce a consistent planning policy for the sustainable management of estuaries;
• assist agency cooperation and the development of partnerships in the development and implementation of estuary improvements;
• facilitate policy coordination and conflict resolution for estuary management;
• encourage estuary management plans to be based on sound information and prepared in a comprehensive, consistent and integrated manner with implementation responsibilities clearly identified and applied;
• increase stakeholders’ appreciation of the full range of available management strategies for consistent approaches to estuary management; and
• assist in providing direction, prioritise management activities and enable early actions to be initiated.

1.3.2 STUDY AREA

The Central West coast of Victoria, between Moonlight Head and Point Lonsdale (Figure 1), contains both permanently and intermittently opened estuaries. Eighteen estuaries (Table 1) have been identified within the region, based on the Land And Water Resources Audit and a region-wide assessment by Chris Harty.

The assessment defining the estuaries used tidal influence and the presence of estuarine wetland vegetation communities to identify estuarine systems compared to smaller streams discharging directly to the coast from steep forested catchments across rocky platforms or sandy beaches.

For the purposes of this study, estuary limits are defined as being upstream to the limit of marine derived saltwater influence and downstream to the limit of terrestrially derived freshwater influence. Influence also relates to water dependent ecosystems and associated habitats (e.g. saltmarshes and mangroves). It is recognised that the estuarine zone will vary depending on various environmental changes such as changes in run-off, tides, wind and waves (Smith et al. 2001).

<table>
<thead>
<tr>
<th>Estuary</th>
<th>Land Use*</th>
<th>Key Estuaries under the NLWR Research and Development Audit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Johanna River</td>
<td>Rural/Park</td>
<td>Unclassified</td>
</tr>
<tr>
<td>Aire River</td>
<td>Rural/Park</td>
<td>Modified</td>
</tr>
<tr>
<td>Barham River</td>
<td>Urban/Rural</td>
<td>Largely Unmodified</td>
</tr>
<tr>
<td>Wild Dog Creek</td>
<td>Rural/Forest</td>
<td>Largely Unmodified</td>
</tr>
<tr>
<td>Skenes Creek</td>
<td>Urban/Rural</td>
<td>Largely Unmodified</td>
</tr>
<tr>
<td>Grey River</td>
<td>Park/Forest</td>
<td>Largely Unmodified</td>
</tr>
<tr>
<td>Kennett River</td>
<td>Urban</td>
<td>Largely Unmodified</td>
</tr>
<tr>
<td>Wye River</td>
<td>Urban</td>
<td>Largely Unmodified</td>
</tr>
<tr>
<td>Separation Creek</td>
<td>Urban</td>
<td>Largely Unmodified</td>
</tr>
<tr>
<td>Cumberland River</td>
<td>Rural/Park/Forest</td>
<td>Largely Unmodified</td>
</tr>
<tr>
<td>St. George River</td>
<td>Rural/Park/Forest</td>
<td>Near Pristine</td>
</tr>
<tr>
<td>Erskine River</td>
<td>Urban</td>
<td>Largely Unmodified</td>
</tr>
<tr>
<td>Moggs Creek</td>
<td>Park/Forest</td>
<td>Unclassified</td>
</tr>
<tr>
<td>Painkalac Creek</td>
<td>Urban/Rural/Park</td>
<td>Largely Unmodified</td>
</tr>
<tr>
<td>Anglesea River</td>
<td>Urban/Park</td>
<td>Modified</td>
</tr>
<tr>
<td>Spring Creek</td>
<td>Rural/Urban</td>
<td>Unclassified</td>
</tr>
<tr>
<td>Thompsons Creek</td>
<td>Urban/Rural/Park</td>
<td>Modified</td>
</tr>
<tr>
<td>Barwon River</td>
<td>Urban/Rural/Park</td>
<td>Modified</td>
</tr>
</tbody>
</table>

* Urban:- residential, commercial or tourism development associated with a township;
Rural:- agriculture, farming or mainly cleared land;
Forest:- vegetated areas, not cleared; Park - national park or public reserve.
# NLWR = National Land and Water Resources.

This document will apply to both private and public land in and adjacent to estuaries in the region. All other coastal waters not defined as estuaries are described in the Central West Victoria Guide to Coastal Waterway Planning and Management 2001 (Brett Lane & Associates 2001). The guide aims to provide concerned citizens and community groups, and officers of government agencies involved in coastal waters planning and management, with a framework for responding to the management needs of coastal waters.

1.3.3 CONSULTATION PROCESS AND SETTING PRIORITIES

The Central West Victoria CMPP recognised that the broader community in the region (i.e. all stakeholders) had a lot to contribute to the development and implementation of this document. Stakeholder consultation was therefore recognised as a very high priority and undertaken from the project’s inception in early 1999. The CMPP Steering Committee, which was made up of representatives from the proponent agencies (Appendix 3), brought together stakeholders from State, regional and local agencies, industry and the community.

To ensure community consultation, participation and support for this document, all stakeholders from the Central West Victoria CMPP Waterway Working Group (Appendix 3) were individually interviewed using a standard questionnaire. Additional interviews
were also conducted with key community groups such as recreational fishing, committees of management and conservation groups. A total of 22 interviews were conducted either in person or over the telephone. Stakeholders were interviewed to ascertain how they valued estuaries, what they perceived as threats and their willingness to be involved in estuary management. Values and threats identified through the stakeholder consultation were prioritised by attributing the values and threats that were mentioned the most to the higher ranking. These common values and threats were then grouped into themes, most of which relate to values and causes of threats to coastal waters listed under Brett Lane & Associates 2001.

The priority ranking of estuaries for undertaking estuary management plans (Table 4) was determined using the frequency of stakeholder responses to the following criteria:
- perceived need for an estuary management plan;
- level of risk to estuary functioning (derived from existing condition inspections and values and threats identification from the consultation process);
- degree of existing planning;
- level of community, industry and government support and willingness to be involved; and
- existing resources available to assist the estuary planning process.

These responses provide the basis for developing the recommendations in this document in terms of issues to be addressed in an estuary and the priority listing of estuary management planning.

Further opportunities for stakeholders to express concerns and comments about estuaries were provided through public exhibition of the draft Central West Victoria Estuaries CAP. The draft plan went through a six-week public consultation period from February to March 2002. During this time it went on public display with the publication of a notice in statewide, regional and local newspapers (e.g. the Age, Geelong Advertiser, Colac Herald and the Echo). Copies of the draft were available through the Regional Coastal Boards, local DSE offices, municipal offices and information centres. The community and other stakeholders were also able to make comments during formal and informal open discussions to target groups and local areas. These included a community workshop held at Barwon Heads to cover the City of Greater Geelong and the Surf Coast Shire, and briefing sessions to Central Coastal Board. The consultation and feedback from the community in the finalisation of this document aimed for wider community input and agreement to the actions and responsibilities. Further continued input from the community will be available under future management structures either through the recommended community reference group or the individual consultation programs established for each individual estuary management plan.

Further details of the consultation process can be found in the Central West Victoria Regional CAP 2002.

### 1.3.4 PROCESS TO IMPROVE PLANNING OF ESTUARIES

The Colac Otway, Surf Coast and Greater Geelong Planning Schemes were reviewed with respect to planning policies and controls applicable to estuaries within the study area. Discussions were held with these three shires regarding potential key planning scheme amendments. In general, amendments pertain to the acknowledgment and reference to estuaries within planning policy, alongside other significant coastal and environmental values. The recommended planning scheme amendments that incorporate the policy improvements for estuary planning in the region are detailed in Appendix 5.

KENNETT RIVER – WHERE THE COMMUNITY ARE ACTIVELY IMPROVING AND MONITORING THE HEALTH OF THE ESTUARY.
2. Strategic Direction

2.1 GUIDING PRINCIPLES

The Central West Victoria Estuaries CAP is based on the principles of Integrated Coastal Zone Management (ICZM), Ecologically Sustainable Development (ESD), Coastal Management Act (1995) Victorian Coastal Strategy (2002), capacity building and community empowerment. These principles are realised through this document by integrating estuary planning and management processes associated with relevant legislation and policies. This document encourages coordination and partnerships between the planning agencies, such as the Western and Central Coastal Boards and the Corangamite Catchment Management Authority, and the on-ground managers, such as Parks Victoria, delegated committees of management and local government. It is founded on improving skills of planners and managers, the participation of local communities at each step in the process, and the continual improvement of outcomes for these estuaries.

2.2 STATEMENT OF SIGNIFICANCE

Estuaries and estuarine wetlands (including seagrasses, mangroves, saltmarshes and reed beds) are important natural systems linking catchments with the sea. They represent unique ecosystems requiring special management to recognise their ecology and to protect and improve their condition. They are an important component of the coastal landscape, and have social and economic values. They are also one of the most productive ecosystems on earth, excelling in nutrient recycling, trapping of sediments and high biodiversity.

ERSKINE RIVER ESTUARY – UNDER ENORMOUS PRESSURE FROM RECREATIONAL USES AND FACILITIES
2.3 PLANNING POLICY

Planning policy sets the broader context for estuary management. Relevant policy statements which influence this document are:

- The biodiversity and natural ecosystems of estuaries within the region be protected from damage or destruction and adverse pressures such as inappropriate land use and development, inconsistent management practices, recreational pressures, littering and lack of knowledge of estuarine processes.
- The waters of estuaries within the region be protected from the damaging effects of sedimentation and polluted runoff.
- The coastal vegetation, estuarine wetlands, landforms and landscapes of estuaries within the region, especially in areas that are visually exposed or have scenic values, are protected from intrusive development.
- All coastal development should be low impact with account for visual and landscape qualities and water sensitive urban sitting and design (eg. roof treatment, building height, massing, colours and finishes of buildings); and where practical waste should be treated on-site and re-used to avoid impacts on estuaries and estuarine wetlands.
- Development of coastal settlements should be contained within existing township boundaries and should contain development setback from estuaries and their wetlands.
- Access by pedestrians, vehicles and livestock to the foreshores of estuaries and estuarine wetlands should be controlled to avoid damage by clearly defined access routes created and maintained by the relevant foreshore management authorities.

2.4 ESTUARY OBJECTIVES

The following objectives have been developed to guide management of estuaries:

- To manage estuaries and estuarine wetlands on an ecologically sustainable basis for long term renewable benefits.
- To protect and conserve estuaries and estuarine wetlands, including those identified in international agreements, for their nature conservation, scientific, recreation, cultural, economic, social and other values.
- To manage and maintain the ecological character and processes of estuaries and estuarine wetlands including the:
  - ability of estuaries to carry natural flows;
  - maintenance of natural flooding regimes including tidal flows;
  - managed opening and closing of estuaries that minimises detrimental effects on the estuarine environment with the long term aim of moving towards a low to minimal intervention approach to estuary mouth opening;
  - filtering of nutrients and other pollutants; and
  - recharge and discharge of ground waters.
- To protect, and in some cases, improve water quality in estuaries and estuarine wetlands.
- To prevent undue erosion, siltation, sedimentation, pollution, loss of flora and fauna and estuarine wetland habitat.
- To encourage restoration, regeneration and revegetation of estuarine habitat with indigenous species.
- To protect cultural (including pre- and post-contact) values.
- To protect visual amenity and encourage use and development, including infrastructure, to be setback from estuaries and estuarine wetlands through buffer zones to protect them from incompatible uses, development and pollution.
- To encourage and assist public appreciation of the many values of estuaries and estuarine wetlands through education, scientific investigation, monitoring and participation.
- To ensure monitoring systems are established to measure the condition of estuaries with the aim to provide a net gain in biodiversity, cultural and amenity values for estuaries and estuarine wetlands.

The toolkit in Section 5 provides more detailed actions to address estuary management issues.
3. The Nature of Estuaries - Their Values and Management Issues

The values and management issues of estuaries in the Central West Region are outlined under the environmental, social and economic themes and listed in Table 2. Further descriptions of values and threats for coastal waterways are found in Central West Victoria Guide to Coastal Waterway Planning and Management (Brett Lane and Associates 2001), the Central West Victoria Regional CAP (Western Coastal Board 2002a) and the Draft Corangamite River Health Strategy (Corangamite Catchment Management Authority 2004).

3.1 VALUES

3.1.1 ENVIRONMENTAL
Estuaries provide important ecological habitats in Victoria, including wetlands, fish and bird habitats, sand banks, mudflats, seagrass beds and mangrove and saltmarsh habitats. These habitats provide important fish breeding and nursery areas and ensure a unique biodiversity, including genetic and geological diversity within the region. This diversity of systems provides opportunities for scientific research and education.

The estuaries in the region have high biological productivity owing to the supply of nutrients in freshwater and sediments from their river catchments. The protection of their waters from wind driven waves, the relatively long residence times of water, their generally shallow waters, the development of extensive subtidal plant communities and the accumulation of sediments allows the development of intertidal macrophyte communities which all contribute to estuarine productivity.

Most estuaries along the Central West Region are intermittently opening systems and have sand bars at their entrance (bar-built estuaries). These estuaries are also commonly referred to as ‘salt wedge’ estuaries (Figure 5). This is due to the effect of stratification arising from freshwater, which is high in oxygen content, flowing over a lower layer of dense saltwater, which can become low in oxygen content due to a lack of mixing. They can be very dynamic systems with changes in salinity occurring with the tidal cycle as marine water enters the estuary on a flood tide and recedes with the ebb tide.

During summer, sand bars can naturally build up and close the mouth of an estuary while river flows are low. This can lead to a build up of ‘brackish’ water in the estuary with high productivity leading to low oxygen/stagnation in deeper waters, blooms and eutrophication.

In winter, increased river flow can break the bar open, allowing the freshwater layer to escape and leaving the de-oxygenated saltwater layer behind, and then allowing marine water to enter the estuary again. During periods of peak flow, floods can exclude marine water completely, thereby inundating marine creatures with freshwater for the period of the flood. In addition, the flood can erode sand banks and create new ones. River flows will be affected from one year to the next by rainfall patterns and cycles of drought (Constable and Fairweather 1997).

Estuaries are directly influenced by the overall river catchment and the conditions of the marine environment. Water quality and quantity is critical to the health of estuaries and the values

FIGURE 5: CROSS SECTION OF AN ESTUARY SHOWING A SALT WEDGE (O’CALLAGHAN 1992)
of estuaries are dependent upon environmental water flows from the river catchment.

It is important for wetlands associated with the estuary to experience periodic flooding (wetting) as well as drying in order to maintain ecological processes associated with wetland flora growth, maintenance of important nursery areas for aquatic life including fish, food chains and fauna breeding cycles. The wetting and drying cycles of estuaries and the shallow wetlands created on their margins are important triggers for the ecological health of estuaries. It is important for communities to appreciate the ecological benefits of seasonal flooding of land adjoining estuaries.

### 3.1.2 SOCIAL

The high level of importance of estuaries is supported by the high number of stakeholder responses which related to social and economic values (Table 2). These are difficult to quantify as there are few studies where these values are documented.

Estuaries in the region have special values associated with their variety of landscapes as well as the aesthetic enjoyment and recreational opportunities they provide. For example, estuaries enable people to access the coast for fishing, swimming, camping, picnicking, walking and viewing wildlife associated with these waterways.

Estuaries also have an important cultural value associated with Aboriginal use and spiritual identity as these systems provided food and shelter for indigenous communities and were sites of community gatherings and celebrations.

### 3.1.3 ECONOMIC

In conjunction with the scenic landscape associated with the Great Ocean Road, these estuaries provide unique environments that make them attractive for holidaying and residential living. This attraction has led to urban and rural development along the Great Ocean Road corridor.

The region, including the Great Ocean Road, attracted nearly 125,000 international overnight visitors and 2.5 million domestic overnight visitors in 1999 (Geelong Otway Tourism 1999). A total of 69% of the international visitors participated in holidaying in the region while 49% of the domestic overnight visitors participated in holidaying and beach activities. Such high numbers of visitors and their associated use of the coast and estuaries make the natural environment of the region an important asset for economic well being of local communities.

### 3.2 REGIONAL ESTUARY MANAGEMENT ISSUES

The dynamic properties and special values of estuaries in the region make them particularly vulnerable to degradation.

People expect to be able to swim and fish in the region’s estuaries with no risk to their health. The local and visiting community also value their beauty and other intrinsic values. These values, and significant aspects of the regional economy, would be jeopardised if the health of these estuaries were to deteriorate. Although some actions for estuary management may be costly, the benefits to the community in terms of lifestyle, recreation and employment are expected to be far greater.

In a regional context the estuaries of Central West Victoria were identified through stakeholder consultation to be affected by the following key threatening processes (Table 3):

- Inconsistent management practices
- Land use and development pressures
- Recreational pressures
- Littering
- Lack of knowledge

<table>
<thead>
<tr>
<th>TABLE 2: VALUES OF CENTRAL WEST VICTORIA ESTUARIES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Environmental</strong></td>
</tr>
<tr>
<td>Biodiversity</td>
</tr>
<tr>
<td>Fish nurseries and habitat</td>
</tr>
<tr>
<td>Environmental values</td>
</tr>
<tr>
<td>Breeding sites</td>
</tr>
<tr>
<td>Water quality and quantity - environmental flows</td>
</tr>
<tr>
<td>Wildlife corridor</td>
</tr>
<tr>
<td><strong>Social</strong></td>
</tr>
<tr>
<td>Recreation</td>
</tr>
<tr>
<td>Viewing wildlife</td>
</tr>
<tr>
<td>Aesthetics</td>
</tr>
<tr>
<td>Variety of landscapes</td>
</tr>
<tr>
<td>Indigenous cultural significance</td>
</tr>
<tr>
<td>Education</td>
</tr>
<tr>
<td>Safe for children</td>
</tr>
<tr>
<td>Boating</td>
</tr>
<tr>
<td>Solitude and remoteness</td>
</tr>
<tr>
<td>Swimming</td>
</tr>
<tr>
<td>Scenic beauty</td>
</tr>
<tr>
<td>Walking</td>
</tr>
<tr>
<td>Peaceful flow of water</td>
</tr>
<tr>
<td><strong>Economic</strong></td>
</tr>
<tr>
<td>Fishing (commercial or recreational)</td>
</tr>
<tr>
<td>Tourism and economic activity</td>
</tr>
<tr>
<td>Productive nature of land - agricultural value</td>
</tr>
<tr>
<td>Sediment and nutrient traps</td>
</tr>
<tr>
<td>Accessible</td>
</tr>
<tr>
<td>Public land</td>
</tr>
</tbody>
</table>

* = Number of times value mentioned in interviews
The management of estuaries has been fragmented and uncoordinated in the past. A number of agencies have had some responsibility for managing estuaries which has generated confusion about who has the ultimate authority and who should take responsibility for these systems (PPK Environment & Infrastructure 2001a, Brett Lane & Associates 2001). To better manage our estuaries, there is a need to provide a coordinated planning and management approach, which allows proposals for development, nature conservation and remedial works to be assessed on an integrated and objective basis with public input into the process. This includes an identification of the types of natural processes occurring in different estuaries and recommendations for appropriate management practices to sustain these processes.

### TABLE 3: THREATS TO CENTRAL WEST VICTORIA ESTUARIES IDENTIFIED IN STAKEHOLDER RESPONSES.

<table>
<thead>
<tr>
<th>Threats to Estuaries</th>
<th>Rating*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inconsistent management practices</td>
<td></td>
</tr>
<tr>
<td>Inconsistent referrals for development and Planning Scheme administration</td>
<td>9</td>
</tr>
<tr>
<td>Too many authorities with fragmented powers and responsibilities</td>
<td>5</td>
</tr>
<tr>
<td>Lack of planning</td>
<td>5</td>
</tr>
<tr>
<td>Inconsistent management</td>
<td>5</td>
</tr>
<tr>
<td>Artificial mouth openings</td>
<td>4</td>
</tr>
<tr>
<td>Land-use and development pressures</td>
<td></td>
</tr>
<tr>
<td>Development pressures</td>
<td>15</td>
</tr>
<tr>
<td>Stormwater and effluent runoff</td>
<td>13</td>
</tr>
<tr>
<td>Sedimentation and nutrients</td>
<td>9</td>
</tr>
<tr>
<td>Agricultural practices</td>
<td>7</td>
</tr>
<tr>
<td>Forestry and logging</td>
<td>3</td>
</tr>
<tr>
<td>Removal of habitat - clearing of vegetation</td>
<td>3</td>
</tr>
<tr>
<td>Over population</td>
<td>3</td>
</tr>
<tr>
<td>Earthworks with infrastructure maintenance</td>
<td>3</td>
</tr>
<tr>
<td>Altered Flows</td>
<td>9</td>
</tr>
<tr>
<td>Pollution</td>
<td>9</td>
</tr>
<tr>
<td>Recreational pressures</td>
<td></td>
</tr>
<tr>
<td>Overuse for Recreation</td>
<td>8</td>
</tr>
<tr>
<td>Too much access or inappropriate access</td>
<td>3</td>
</tr>
<tr>
<td>Boating over use</td>
<td>1</td>
</tr>
<tr>
<td>Restricted access</td>
<td>1</td>
</tr>
<tr>
<td>Inadequate enforcement of regulations and use of estuary</td>
<td>1</td>
</tr>
<tr>
<td>Littering</td>
<td></td>
</tr>
<tr>
<td>Littering and rubbish dumping</td>
<td>8</td>
</tr>
<tr>
<td>Lack of knowledge</td>
<td></td>
</tr>
<tr>
<td>Lack of awareness</td>
<td>8</td>
</tr>
<tr>
<td>Lack of knowledge of estuary processes and condition</td>
<td>7</td>
</tr>
<tr>
<td>Others</td>
<td></td>
</tr>
<tr>
<td>Feral pests and weeds and Spartina</td>
<td>5</td>
</tr>
<tr>
<td>Over fishing (eel fishing)</td>
<td>2</td>
</tr>
<tr>
<td>Acid sulphate soils</td>
<td>2</td>
</tr>
<tr>
<td>Greenhouse effect - sea level rise</td>
<td>1</td>
</tr>
</tbody>
</table>

* = Number of times threat mentioned in interviews

### 3.2.1 INCONSISTENT MANAGEMENT PRACTICES

The management of estuaries has been fragmented and uncoordinated in the past. A number of agencies have had some responsibility for managing estuaries which has generated confusion about who has the ultimate authority and who should take responsibility for these systems (PPK Environment & Infrastructure 2001a, Brett Lane & Associates 2001).

Estuaries can open artificially or naturally. Natural openings usually occur during floods, periods of consistent high flows or as a result of storm events or large seas eroding the beach berm blocking the entrance. These natural openings can cause significant changes and damage to the mouth of the estuary due to the high water flows involved. However, natural openings are relatively infrequent and irregular and are subject to specific river flows and weather events. Decisions to open estuaries artificially are usually made to prevent flooding buildings and infrastructure and can result in rapid change to natural estuary processes. This is further complicated by local authorities not always defining actual floodplain and/or flood height limits for the definition of allowable building envelopes, including pre-defined minimum floor heights above a flood datum.

To overcome confusion and conflict with decisions to artificially open the entrance of estuaries, Deakin University in partnership with organizations such as the Western Coastal Board, Corangamite and Glenelg Hopkins CMA’s, the Department of Sustainability and Environment and Parks Victoria have established a Post Doctoral Fellowship project to research and develop an Estuary Entrance Management Decision Support System. The Decision Support System will initially be applied to four estuaries along the west coast and will include specifically the Aire River and Anglesea River estuaries within the Central West Victoria coast. The Estuary Entrance Management Decision Support System will integrate the myriad of issues, considerations and effects into the decision making process concerning the artificial opening of estuary entrances and the associated impacts on the environmental, social and economic values of intermittently open and closed estuaries. It is anticipated that the project will be completed by 2006. The results of the project may have application elsewhere within Victoria and interstate.

Water allocation decisions are important for estuaries due to the close links between environmental water flows and estuary health. It is vital to recognise that water allocation decisions will impact on estuary health and may limit the scope of an estuary management plan. There is a need to ensure that estuary management planning is integrated with the recommendations of streamflow management plans (prepared by Southern Rural
Water and Corangamite Catchment Management Authority) in relation to their environmental flow needs. This also applies to the recommendations and program actions of the Regional Catchment Strategy and draft Corangamite River Health Strategy prepared by the Corangamite Catchment Management Authority (CCMA).

A toolkit for estuary management is included in Section 5.

### 3.2.2 LAND USE AND DEVELOPMENT PRESSURES

Many of the environmental issues for estuaries and their catchments are primarily the result of cumulative impacts from a variety of land and waterway uses and activities. These contribute to changed estuary processes including reduced water quality and quantity.

New and existing land use and development (e.g., urban development, agriculture, forestry, tourism, and recreation) contribute to the impact on aquatic health of estuaries. These threats include:

- Encroaching urban development;
- Flooding and altered flows;
- Clearing of vegetation;
- Effluent and stormwater discharge;
- Demand for access by livestock and people; and
- Pest plant and animals.

Continuing inputs of water from the catchment and adjacent land, carrying nutrients and pollutants, combined with evaporative concentration, can lead to a gradual deterioration in water quality. Eutrophication in estuaries as a result of nutrient enrichment can lead to blooms of algae and aquatic plants, which in turn can cause low dissolved oxygen levels with associated impacts upon aquatic fauna.

Rising water levels may flood septic tanks or sewerage infrastructure causing leakage of potentially harmful bacteria into the estuary. High levels of coliform bacteria may indicate that the estuary is unsuitable for recreational pursuits that require contact with the water (e.g., swimming, boating, and fishing).

Domestic and agricultural effluent sources and stormwater runoff that flow into estuaries and associated wetlands need to be identified and managed appropriately to avoid negative impacts such as eutrophication.

These threats need to be considered in any estuary management plan through statutory frameworks such as the provisions of municipal planning schemes, other strategic plans or works and education programs. There are also a number of strategic actions in the Central West Victoria Regional CAP (Western Coastal Board 2002a) that provide direction for managing land and water activities. Planning needs to ensure that precedence is not used as an argument to allow the further development of inappropriate land uses and developments. The State Environment Protection Policy (Waters of Victoria) and Victoria Stormwater Action Program provide water quality objectives for reducing the impact of human activities on stormwater and other pollution issues.

As part of the development of this document a review was undertaken of the planning policies and controls applicable to the estuaries within the study area. The review is also intended to assist the Central West Victoria Coastal Planning Scheme Review (Maunsell McIntyre 2002) to consider improvements to the planning schemes as they relate to estuary planning and management. Appendix 6 provides a detailed list of recommended amendments and a summary of the application of policies, zones, and overlays for each municipality in the study area.

In the majority of estuaries the waterway and adjoining land is zoned Public Conservation and Resource Zone reflecting the desire to protect public land and waterways. The application of overlays appears less consistent with a variety of overlays used both for the estuary itself and for land adjoining the estuary. The use of the Environmental Significance Overlay appears warranted to provide some consistency in ensuring that the environmental values of estuaries are protected from not only land use issues but also development issues.

The application of planning policy guidelines for estuaries through the Greater Geelong, Surf Coast and Colac Otway Planning Schemes and the consent process under the Coastal Management Act 1995 ensures that decisions to approve the use and development of private and public land are consistent by using similar decision guidelines.

The importance of estuaries to Aboriginal cultural heritage and the need to consult with local Aboriginal communities to ensure that cultural heritage values are recognised, protected, and managed is also a challenge for planning and management authorities.

### 3.2.3 RECREATIONAL PRESSURES

The estuaries of this region can be damaged through overuse from trampling of wetland and foreshore vegetation, littering, pressures for more tourism developments and active and passive recreational pursuits.
Measures that can protect estuary values include planning policies that direct recreational development and infrastructure to appropriate areas. The development of education programs for recreational operators and users would inform these groups about the values and sensitivities of estuaries and their ecosystems. Appropriate on-ground works can prevent undue pressures and levels of disturbance to areas identified as sensitive to particular activities such as restricting people walking amongst wetland vegetation to access the banks of an estuary.

### 3.2.4 LITTERING
There are problems associated with rubbish accumulation and littering in and around estuaries. Estuaries are located at the bottom of the catchment and often contain either extensive floodplains or coastal wetland habitats. As such, they tend to accumulate any refuse materials dropped, dumped or transported by the river, stormwater system or through recreational use. This creates problems not only for the wildlife living within the estuary but also for marine life when these waters run out to sea. Further impacts are associated with litter detracting from the scenic values and leads to a downgrading in perception of the value of the estuary. Litter therefore has both a physical and visual impact on estuaries.

Measures to address littering will need to encourage the ‘take out what you take in’ principle, along with other strategies to minimise and collect waste eg. signage, use of biodegradable packaging, servicing of rubbish bins and enforcement. These and other suggested actions are listed in the estuary management tool kit in Section 5.

### 3.2.5 LACK OF KNOWLEDGE
A significant constraint on effective management is the lack of site-specific information and knowledge about estuary functioning and processes. Information is particularly critical when the implications of decisions are unknown and managers operate in an environment of uncertainty. Without such knowledge management decisions are ad-hoc and fragmented. So far estuary research has not been adequately linked to management needs and has been unable to focus on long-term questions of sustainability due to resource limitations. Because estuaries are complex systems it is necessary to have a detailed understanding of estuary processes before management plans are implemented.

Generally, there is little water quality information collected for the estuaries in a systematic manner. Ongoing ecological and hydrological studies are needed to determine optimum water levels for estuary entrance opening and for the identification and understanding of hydrological and ecological processes and impacts. The establishment of river height staff plates in key flow areas and “Waterwatch” programs would facilitate information collection. Establishing a community based monitoring framework based on environmental reporting processes for eg. entrance conditions and responses particularly for entrance openings, would also be beneficial.
4. Action Plan

The following action plan sets out to address issues associated with estuaries in the region by providing management strategies to improve the condition and valued use of these regionally significant areas. The implementation of the action plan will be partnership with agencies and the community. An implementation plan will be developed with key stakeholders.

4.1 OUTCOME

Estuaries in the Central West Region are protected and restored, and used sustainably in a cooperative and consistent management approach.

4.2 PRACTICE CHANGE

Communities and government agencies working collaboratively in a consistent and integrated framework to protect, restore and sustainably use estuaries and their associated wetlands.

4.3 CHANGES NEEDED

- Planning structures and resources required to implement this Estuaries CAP are engaged, as well as a forum and process for on-going coordination, monitoring and review.
- Consistent and comprehensive planning policy, controls and decision guidelines for estuaries and their wetlands are in place and consistently applied for the region’s planning schemes, Coastal Management Act 1995 consents, applications for works through the Water Act 1989 and other relevant strategies and management plans.
- A good understanding of estuary processes is achieved prior to the development of plans.
- Estuary management plans are developed with consistent formats and address all known and potential issues.
- A planning and management framework is in place to coordinate and develop improved outcomes for estuaries and their wetlands, including better management of development and land uses which influence estuarine health.
- Estuary management plans are endorsed by the relevant planning authorities and public land managers. All plans prepared for Crown land must be endorsed by DSE.
- Willingness, awareness and management tools (eg. protocols and land-use agreements) in place to protect Aboriginal cultural heritage on or adjacent to estuaries and their wetlands.
- A common set of management tools for estuaries are used regularly in the decision making process.
- The community (including the Aboriginal community) are active participants in input of local knowledge, decision making and monitoring of estuaries and their wetlands.

4.4 KEY STRATEGIC ACTIONS

4.4.1 INTEGRATED ESTUARY PLANNING

Ensure that the region’s estuaries have an integrated planning and management structure, particularly for estuaries requiring a management plan (as described in Figure 6).

Responsibility (and Partners): WCB in partnership with CCMA (local government, PV, foreshore COM, DSE/DPI)

4.4.2 PLANNING POLICY

Ensure that the protection and enhancement of estuaries are given priority as part of the continual improvement of the Greater Geelong, Surf Coast and Colac Otway Planning Schemes. Adopt the planning policy recommendations of the Central West Victoria Coastal Planning Scheme Review (2002), Section 2 and Appendix 5 of the Central West Victoria Estuaries CAP and other strategies and plans relevant to estuaries and their wetlands in the region. In particular, introduce an appropriate policy component to the Greater Geelong Planning Scheme as it applies to the Barwon River and Thomsons Creek estuaries and wetlands.

Responsibility (and Partners): Local municipalities (DSE, CCMA, WCB, CCB)

4.4.3 PLANNING ZONES AND OVERLAYS

Develop and implement a priority program for applying appropriate zones, overlays and associated schedules in the Greater Geelong, Surf Coast and Colac Otway Planning Schemes. This will ensure the implementation of the policy recommendations from the Central West Victoria Coastal Planning Scheme Review (2002), Section 2 and Appendix 5 of the Central West Victoria Estuaries CAP and to give effect to other strategies and plans relevant to estuaries and their wetlands in the region. In particular, introduce a new schedule to the Surf Coast and Colac Otway Planning Schemes Environmental Significance Overlay (ESO) to cover estuaries and estuarine wetlands.

Responsibility (and Partners): Local municipalities (DSE, CCMA, WCB, CCB)

4.4.4 PRIORITY ESTUARY MANAGEMENT PLANS

Prepare High and Medium priority estuary management plans, and implement management options for other estuaries listed in Table 4. Table 4 outlines options for improved management of estuaries. Not all estuaries may require a separate management plan and other options may include the extension of existing plans and/or other management activities. The timing for high and medium priority estuaries is based on information obtained from the Central West Victoria CMPP Waterway Management Working Group (Appendix 3).

Responsibility (and Partners): Public land managers – local government, PV and foreshore COM (WCB, CCB, CCMA, DSE/DPI)
**TABLE 4: ESTUARIES REQUIRING MANAGEMENT PLANS**

### High priority – within 1 to 2 years

<table>
<thead>
<tr>
<th>Estuary</th>
<th>Manager</th>
<th>Relevant Plans/Studies</th>
<th>Management Option</th>
<th>Performance Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aire River Estuary</td>
<td>Parks Victoria</td>
<td>Aire River and Milangil Wetlands Preliminary Management Plans (Parr-Smith et al. 1993), Heritage Rivers and Natural Catchment Areas: Draft Management Plans (Department of Natural Resources and Environment 1997), Otway National Park Management Plan (Department of Natural Resources and Environment 1996). A Memorandum of Cooperation was signed in 2003 between Parks Victoria, Corangamite CMA, Kirrae Whurrung Native Title Working Group, Framlingham Aboriginal Trust and Aire Valley Landowners for the development of protocols and principles for the ongoing management of the Aire River and in particular the process of consultation and decision making regarding river mouth openings. The Memorandum won an ‘Excellence in Innovation’ Award at the 2004 Victorian Coastal Council Awards.</td>
<td>Continue the development of protocols and principles for the ongoing management of the estuary under the Memorandum of Cooperation.</td>
<td>Continued implementation of the Memorandum of Cooperation and implementation of the Estuary Entrance Management Decision Support System by 2007.</td>
</tr>
<tr>
<td>Anglesea River Estuary</td>
<td>Great Ocean Road Coast COM/Surf Coast Shire</td>
<td>Deakin University Anglesea River Study (Pope pers. comm.), Anglesea CAP (Chris Dance 1999), Anglesea Heath Management Plan</td>
<td>Prepare management plan and coordinate with Environment Protection Authority’s Neighbourhood Environment Improvement Program (NEIP)</td>
<td>Plan completed by Dec 2005</td>
</tr>
<tr>
<td>Barwon River Estuary</td>
<td>Parks Victoria/ Barwon Coast COM/ City of Greater Geelong</td>
<td>Lake Connewarre Management Plan (Department of Conservation and Natural Resources 1993), Vegetation Study (Yugovic 1985), Deakin University Hydrological Study, Lower Barwon Study (Cecil et al. 1988), Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar Site Strategy Management Plan 2003.</td>
<td>Continue to implement the Barwon River Mangroves – Concept Plan, which has already seen up to $150,000 of on-ground works completed for the protection of mangrove, saltmarsh and river banks from damage and erosion.</td>
<td>Plan implementation within set timeframes</td>
</tr>
<tr>
<td>Spring Creek Estuary</td>
<td>Great Ocean Road Coast COM</td>
<td>Spring Creek Catchment Plan, 2003</td>
<td>Extend catchment plan to include estuary or develop conservation plan to manage adjoining development activities, Monitor estuary health and condition.</td>
<td>Plan completed by Dec 2007</td>
</tr>
</tbody>
</table>

### Medium Priority – within 3 to 4 years

<table>
<thead>
<tr>
<th>Estuary</th>
<th>Manager</th>
<th>Relevant Plans/Studies</th>
<th>Management Option</th>
<th>Performance Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thompsons Creek Estuary</td>
<td>City of Greater Geelong/ Surf Coast Shire/ Parks Victoria</td>
<td>Breamlea Foreshore Management Plan (Thompson Berrill Landscape Design 1999), Thompsons Creek Catchment Plan (Thompsons Creek Catchment Committee 1998)</td>
<td>Option to extend catchment plan to include estuary.</td>
<td>Plan completed by Dec 2007</td>
</tr>
<tr>
<td>Spring Creek Estuary</td>
<td>Great Ocean Road Coast COM</td>
<td>Spring Creek Catchment Plan, 2003</td>
<td>Extend catchment plan to include estuary or develop conservation plan to manage adjoining development activities, Monitor estuary health and condition.</td>
<td>Plan completed by Dec 2007</td>
</tr>
<tr>
<td>Estuary</td>
<td>Manager</td>
<td>Relevant Plans/Studies</td>
<td>Management Option</td>
<td></td>
</tr>
<tr>
<td>----------------------------</td>
<td>------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Wild Dog Creek Estuary</td>
<td>Apollo Bay/Kennett River COM</td>
<td>Marengo to Skene Creek CAP (Western Coastal Board 2001), Apollo Bay Estuaries Management Action Plan for the Barham River, Wild Dog Creek and Skene Creek. (Chris Hart Planning and Environmental Management on behalf of the Southern Otway Landcare Network and Apollo Bay - Kennett River Foreshore Committee of Management, 2003).</td>
<td>Monitor estuary health and condition.</td>
<td></td>
</tr>
<tr>
<td>Skene Creek Estuary</td>
<td>Apollo Bay/Kennett River COM</td>
<td>Marengo to Skene Creek CAP (Western Coastal Board 2001), Apollo Bay Estuaries Management Action Plan for the Barham River, Wild Dog Creek and Skene Creek. (Chris Hart Planning and Environmental Management on behalf of the Southern Otway Landcare Network and Apollo Bay - Kennett River Foreshore Committee of Management, 2003).</td>
<td>Monitor estuary health and condition.</td>
<td></td>
</tr>
<tr>
<td>Kennett River Estuary</td>
<td>Apollo Bay/Kennett River COM</td>
<td>Angahook-Lorne State Park Management Plan (Parks Victoria 1999)</td>
<td>(To be implemented before 2007): Develop combined management plan which includes Separation Creek and Wye River, Support monitoring programs.</td>
<td></td>
</tr>
<tr>
<td>Wye River Estuary</td>
<td>Wye River Foreshore COM</td>
<td>Angahook-Lorne State Park Management Plan (Parks Victoria 1999)</td>
<td>(To be implemented before 2007): Develop combined management plan which includes Separation Creek and Wye River, Monitor estuary health and condition</td>
<td></td>
</tr>
<tr>
<td>Separation Creek Estuary</td>
<td>Wye River Foreshore COM/ Colac Otway Shire</td>
<td>Angahook-Lorne State Park Management Plan (Parks Victoria 1999)</td>
<td>(To be implemented before 2007): Develop combined management plan which includes Wye and Kennett Rivers, Monitor estuary health and condition</td>
<td></td>
</tr>
<tr>
<td>St George River Estuary</td>
<td>Great Ocean Road Coast COM/Surf Coast Shire</td>
<td>Angahook-Lorne State Park Management Plan (Parks Victoria 1999)</td>
<td>(To be implemented before 2007): Extend Lorne CAP or Erskine River and Stony Creek Catchment Plan.</td>
<td></td>
</tr>
<tr>
<td>Erskine River Estuary</td>
<td>Great Ocean Road Coast COM</td>
<td>Erskine River and Stony Creek Catchment Plan (Franke 2000), Lorne Coastal Action Plan (Western Coastal Board 1998)</td>
<td>(To be implemented before 2007): Extend catchment plan to address estuary specific issues.</td>
<td></td>
</tr>
</tbody>
</table>
**4.4.5 ESTUARY MANAGEMENT PLAN TOOLKIT**

Ensure that estuary management plans consider using the Toolkit for Estuary Management in Section 5. The toolkit represents an opportunity for estuary management plans to be prepared with consistent formats and assist managers with direction on estuary management.

*Responsibility (and Partners):* Public land managers – local government, PV and Foreshore COM (WCB, CCMA, DSE/DPI, CCB)

**4.4.6 INTEGRATION OF ESTUARY MANAGEMENT PLANS**

Encourage the incorporation of estuary management plans into other land or water management plans, business plans, corporate plans or municipal planning schemes by all relevant local and state government agencies.

*Responsibility (and Partners):* WCB in partnership with CCMA (DSE/DPI, local government, PV, CCB and Foreshore COM)

**4.4.7 ASSESSING PERMITS AND CONSENTS**

Encourage the use of the Toolkit for estuary management (Section 5) to assess applications for planning permits, Coastal Management Act 1995 consents and works in waters under Section 67 of the Water Act 1989.

*Responsibility (and Partners):* Public land managers, local government and DSE (WCB, CCB, CCMA)

**4.4.8 ENGAGE INDIGENOUS COMMUNITIES**

Further facilitate the involvement of indigenous communities in decision making and management of estuaries, in particular develop where appropriate use and development protocols and land-use agreements to ensure the protection and management of Aboriginal cultural heritage in or adjacent to estuaries and their wetlands.

*Responsibility (and Partners):* Public land managers, local government, DSE in partnership with local Aboriginal communities (WCB, CCB, CCMA)

**4.4.9 COMMUNITY MONITORING**

Encourage the further extension of Waterwatch and other community monitoring programs to measure the health and use of estuaries and their associated wetlands.

*Responsibility (and Partners):* CCMA in partnership with EPA (public land managers, DSE/DPI)

**4.4.10 IMPLEMENT THE CORANGAMITE RIVER HEALTH STRATEGY**

Implement the recommendations, policies and actions of the Draft Corangamite River Health Strategy relevant to managing impacts of catchment activities that affect estuary health.

*Responsibility (and Partners):* CCMA (DSE/DPI, Local Government and COM)

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**THOMPSONS CREEK ESTUARY – A PLACE OF NATURAL AND CULTURAL HERITAGE SIGNIFICANCE**
Corangamite Catchment Management Authority (CCMA) and the Western Coastal Board (WCB)

The two organisations will coordinate and provide strategic guidance for estuary planning, and review of estuary management plans. They may also assist with finding funds to implement the CENTRAL WEST VICTORIA ESTUARIES CAP.

These authorities are in a unique position to coordinate their respective responsibilities for estuary management through their broad representation from both state and local government and the community, and technical expertise.

PROJECT MANAGER/S
Public Land Manager/s

The project manager includes those agencies or bodies identified as having a key role and responsibility for a particular estuary (see Schedule 1). Their role is to initiate actions to improve estuary management, including the development of estuary management plans for High and Medium priority estuaries.

The Manager will draw up and endorse plans in partnership with the WCB and CCMA, an estuary community reference group (set up by the project manager with terms of reference), and other stakeholders including industry. One of the key tasks will be to source sufficient funds and other resources to develop and implement the plan.

OTHER STAKEHOLDERS
DSE, DPI, local government, industry, EPA

These stakeholders are identified by their particular roles in planning and managing activities in and around estuaries. They can provide technical, planning and other advice, and resources.

COMMUNITY REFERENCE GROUP
Local government, PV, committees of management, estuary users, tourist operators, other industry groups and representatives, local conservation groups

The close consultation and input to estuary management by communities around estuaries is considered crucial to the development and ownership of estuary initiatives, including management plans, and their role as custodians of the estuary.

PROJECT OFFICER
employee of project manager or consultant

The role of the project officer is to research and prepare the estuary management plan with guidance from the project manager, and in consultation with the community reference group and other stakeholders.
This toolkit assists implementation of this document by outlining a range of issues, objectives and actions to assist managers. They can be considered and applied in the management of individual estuaries subject to investigating their applicability, appropriateness and consultation with local communities. Particular actions can be selected for discussion and potential implementation on an individual estuary basis. Thirteen topics have been identified and listed with management actions for planning, works, education and monitoring:

1. Habitat and species conservation
2. Water quality
3. Sedimentation and erosion
4. Cultural heritage
5. Recreation
6. Flooding
7. Estuary entrance
8. Sea Level Rise
9. Fishing
10. Visual amenity
11. Information
12. Estuary management plan format
13. Development Planning
14. Development Assessment

5.1 HABITAT AND SPECIES CONSERVATION

Estuaries contain a variety of important habitat areas including aquatic, foreshore and riparian environs. These areas include coastal wetland ecosystems comprising seagrass, saltmarsh and reed bed communities. They support a high diversity of fauna species and as such are sensitive to disturbance both in a direct physical sense as well as indirectly through altered processes such as a reduction in water flow or water quality due to nutrient inputs. Stock access can be managed to improve vegetation protection through either stock removal or access restricted through fencing.

5.1.1 MANAGEMENT OBJECTIVE

Restore and protect native aquatic, wetland and foreshore flora and fauna.

5.1.2 PLANNING

Aquatic Habitats

- Protect key and representative estuarine aquatic habitats such as wetlands, saltmarshes, mangroves, seagrass beds, rock platforms, ledges and key wildlife habitats such as beach nesting sites, inter-tidal feeding grounds, high tide roosts and islands by appropriate environmental policies, zonings, overlays (the Victorian Planning Provisions) or reservation under the Crown Lands (Reserves) Act 1978. If privately owned, consider acquisition with the consent of the owner to the National Park or Crown Reserve systems or application of conservation covenants.
- Review local planning provisions to ensure estuaries are recognised and that there are adequate measures to control and minimise impacts from works and developments adjacent to estuaries.
- Change the use of land that will have an adverse effect on adjacent sensitive aquatic habitats through rezoning and transfer development rights, if any, to less sensitive land.

Foreshore and Riparian Zones

- Bring foreshore and riparian areas into public ownership whenever opportunities arise through rezoning, development approvals or acquisition.
- Implement Government approved former Land Conservation Council recommendations for the reservation of public land around estuaries.
- Consider recommendations arising out of any crown frontage reviews relating to estuaries frontages and foreshores.
- Define foreshore and riparian buffer zones of a width sufficient to satisfy bank stability, habitat, food supply, wildlife movement, pollutant filtering and visual concerns. Introduce appropriate zones or overlays, which protect such buffer zones from inappropriate development.
- Negotiate property agreements and assist the formulation of whole farm planning with owners of land with plant and animal species and/or ecological communities or populations of significant conservation value.
- Develop Regional Vegetation Management Plans incorporating coastal wetlands, foreshore and riparian zones.
- Phase out non coastal dependent activities in foreshore and riparian zones on public land such as golf courses, public halls, tennis courts etc.

Aquatic Animals and Wildlife

- Identify key or rare or threatened aquatic animal and estuarine dependent wildlife species and protect them and
their habitats by appropriate planning and development controls including buffer zones.

- Protect important habitat for migratory waders and species listed in JAMBA, CAMBA, Bonn, Ramsar.
- Manage flora and fauna associated with estuaries in accordance with management plans, management agreements and FFG Action Statements.

5.1.3 WORKS

- Implement approved management plans and strategies that control or minimise processes or activities that threaten estuaries.
- Restore degraded aquatic, foreshore and riparian habitats by revegetation and regeneration using appropriate revegetation techniques to encourage the re-establishment of indigenous species and control weeds and feral animals.
- Ensure revegetation works are approved so that the appropriate species are being used.
- Protect and enhance remnant vegetation eg. wetland biolink, river reach restoration and sub-catchment restoration programs offered by the Corangamite Catchment Management Authority.
- Restrict access to habitats to keep off stock through fencing, vehicles and people whilst providing appropriate access points.
- Identify existing drainage systems that may be detrimentally affecting coastal wetlands and prepare a plan to remove or mitigate such problems.
- Integrate municipal stormwater management plans with estuary plans.
- Modify or remove barriers to fish passage.

5.1.4 EDUCATION

- Educate the community on the value of estuarine habitats and how they can contribute to their protection including multi-cultural learning opportunities.
- Educate Council outdoor staff and Committees of Management on the value of foreshore vegetation.
- Erect interpretive signage adjacent to valuable habitats.
- Provide opportunities for the community to participate in restoration and management of aquatic, coastal wetland and wildlife habitats (Coast Action/Coastcare programs).
- Introduce an education and enforcement program to stop the "creeping backyard" effect associated with people planting and mowing beyond their boundaries without appropriate advice.

5.2 WATER QUALITY

When a river mouth closes off, tidal flushing is eliminated. Continuing inputs of water from the catchment and adjacent land, carrying nutrients and pollutants, combined with evaporative concentration, can lead to a gradual deterioration in water quality. Eutrophication resulting from nutrient enrichment can lead to blooms of algae and aquatic plants, which in turn can cause low dissolved oxygen levels with associated impacts upon aquatic fauna.

Rising water levels may flood septic tanks or sewerage infrastructure causing leakage of potentially harmful bacteria into the estuary. High levels of coliform bacteria may indicate that the estuary is unsuitable for recreational pursuits that require contact with the water (swimming).

These problems are more likely to be more noticeable in areas that are more heavily developed or populated.

The overall key is to ensure integration between any estuary management plan and the recommendations and program actions of regional catchment strategies that have been prepared by the Corangamite Catchment Management Authority (CCMA). This also applies to the development of streamflow management plans prepared by Southern Rural Water/Corangamite Catchment Management Authority in relation to the maintenance of environmental flows for estuaries. Estuary management plans could be considered by the CCMA as integrated resource management plans to facilitate coordinated management for estuarine values and water quality.

5.2.1 MANAGEMENT OBJECTIVE

Achieve a standard of water quality and quantity that protects the diversity and abundance of aquatic ecosystems and allows recreational and aesthetic enjoyment of the estuary.

5.2.2 PLANNING

- Develop and adopt water quality standards that are unique for the estuary to protect aquatic ecosystems and enable human usage. Comply with existing standards set out under State Environment Protection Policy – Waters of Victoria.
- Develop and adopt a system of cumulative impact assessment for land use planning and development control by undertaking pollutant inventories and budgets for existing land uses and making land and water capability assessments to establish total allowable pollutant loads and other relevant loads or factors.
- Control development, eg. Reclamation, causeways, floodgates and weirs, and management practices that may restrict water and tidal flow within the estuary proper.
- Support initiatives of approved management plans and strategies (eg. Streamflow Management Plans prepared by Southern Rural Water/Corangamite Catchment Management Authority) which aim to restore appropriate hydrological regimes to estuaries.
- Ensure that estuary water regimes and environmental values are considered in appropriate bulk entitlement conversion and new allocation processes.
- Develop management agreements to encourage water authorities to take account of the environmental values of estuaries that are part of the water distribution system.
- Plan for oil spill contingencies from shipping or fixed installations such as stormwater drainage systems.
• Establish water quality standards for stormwater runoff from new development considering the estuary’s temporal response to pollutant inputs (daily, weekly or monthly) and within the framework of the cumulative impact assessment. Comply with State Environment Protection Policy – Waters of Victoria to minimise the impacts of diffuse sources of polluted run-off.

• Apply the Best Practice Environmental Management Guidelines for Urban Stormwater (EPA).

• Prepare and adopt a Soil and Water Management Policy that requires submission of a Soil and Water Management Plan with an application for Planning Permit or consent under the Coastal Management Act 1995, setting out how erosion and sediment control, water quality and water quantity will be managed during both the construction and operational stages to achieve the required water quality standards. Incorporate in the Policy the condition that pre and post development monitoring be undertaken at the developer’s cost.

• Require submission of an environmental management plan for any development proposals with potential to pollute waterways.

• Adopt water sensitive design principles for new development on land draining to eutrophic or sensitive receiving waterways through the planning scheme.

• Where land use will have an adverse effect on the adjacent waterway, particularly poorly flushed systems, rezone and/or transfer development rights to less sensitive land.

• Require planning approval for any proposed intensive agricultural land use.

• Permit development on unsewered urban or rural lots only where there is sufficient area of suitable soil away from drainage lines to satisfactorily dispose of septic effluent on site.

• Prepare stormwater management plans and apply the Best Practice Environmental Management Guidelines for Urban Stormwater (EPA) for existing developed areas within the framework of the cumulative impact assessment to reduce the impacts of diffuse sources of pollution.

• Review and ensure that Regional Fire Protection Plans and local bushfire management practices protect sensitive estuarine vegetation communities from inappropriate fire hazard reduction programs.

• Mechanically remove algal accumulations, which may block or choke estuarine waterways subject to careful ecological assessment.

5.2.4 EDUCATION

• Educate the community on environmentally responsible practices around the house that preserve water quality such as composting grass clippings, using organic rather than synthetic fertilisers with correct application according to soil requirements. Revegetating bare soil areas, using phosphate free detergents, washing cars on grass, capturing pet droppings and not dumping refuse on the foreshores and in the bush.

• Educate specific industry groups and developers of best management practices for minimising polluted runoff.

• Detect illegal discharges of septic or other effluent sources (eg. dairy discharge) and prosecute.

5.3 SEDIMENTATION AND EROSION

Statutory controls concentrate on addressing the source of the erosion in stream banks and the catchment. Works cover rehabilitation of erosion sources, trapping sediment before it reaches the estuary and removing sediment from where it has been deposited in the estuary. Fencing can also be used to remove or restrict stock access to river banks in order to avoid erosion and vegetation damage and loss.

5.3.1 MANAGEMENT OBJECTIVE

Minimise estuary sedimentation and erosion caused by the effects of human activity in the catchment, along riverbanks and on the estuary foreshore.

5.3.2 PLANNING

• Prepare and adopt an Erosion and Sediment Control Policy or apply the Environment Protection Authority publication Construction Techniques for Sediment Pollution Control.

• Require that an Erosion and Sediment Control Plan be submitted with planning applications or applications for approval under the Coastal Management Act 1995 that involve activities that disturbs the ground.

• Where bank erosion or loss of seagrass cover is attributable to boating, review current boating controls considering bank sediment type, seagrass beds, noise to residents and birdlife, prevailing wind/wave climate, bed sediment type and water depth, boat and waterway user safety.

• Control boating traffic through the application of speed restrictions during high water levels to minimise bank erosion.
5.3.3 WORKS
- Protect eroding banks with, wherever possible, locally native species and by directing access to appropriate locations. Use hard protection only where necessary (eg. the intertidal zone if unavoidable boat waves are causing erosion, or where major assets are threatened). Control or remove stock access through fencing or other appropriate means.
- For existing urban development in the catchment, retrofit sediment traps, sedimentation basins or wetlands.
- Undertake a catchment soil degradation survey and assess sediment yield of sources to streams and the estuary and remediate sources of high risk to the estuary.
- Review condition of existing stormwater drain outlets and repair, construct sediment/nutrient traps or constructed wetlands where appropriate and remove sediment fans.
- Stabilise entrance dunes, wherever possible with appropriate revegetation techniques to encourage the reestablishment of indigenous species, but not within the entrance floodway.

5.3.4 EDUCATION
- Educate the community on the need to prevent sediment generation at the source by drain stencilling, preventing soil being washed from yards, vegetation buffers etc.

5.4 CULTURAL HERITAGE
As estuaries are a rich source of food for Aboriginal and European cultures, there is often evidence of pre-contact Aboriginal occupation around estuary foreshores including shell middens, artefact scatters and burials. They are part of the heritage of all Australians. Development has led to the destruction of some of these sites, increasing the need to preserve remaining sites.

Protection of Aboriginal heritage sites occurs through existing Federal (Aboriginal and Torres Strait Islander Heritage Protection Act 1984) and State (Archaeological and Aboriginal Relics Preservation Act 1972) legislation. Aboriginal people are an equal part of today’s society and the use of estuarine environments is an important part of their culture as they use these areas in the maintenance of their cultural practices.

European heritage is also an important value of estuaries given their focus for early settlement and maritime industry.

Strategies developed for this management area include identification and protection of Aboriginal and European heritage sites through mechanisms such as planning controls, restoration of degraded sites, controlling public access and provision of interpretive signage where appropriate.

5.4.1 MANAGEMENT OBJECTIVE
Protect the Aboriginal and European heritage of the estuary and foreshore.

5.4.2 PLANNING
- Identify sites of significant European heritage and protect through planning schemes.
- Protect areas of Aboriginal cultural sensitivity through planning schemes in consultation with local Aboriginal groups.
- Ensure that new works are assessed for any cultural or heritage significance as part of the development of planning applications.

5.4.3 WORKS
- Restore degraded European sites and control public access if necessary.
- Manage, protect and stabilise Aboriginal cultural heritage sites in accordance with Aboriginal Affairs Victoria’s Conserving Aboriginal Places in Coastal Victoria (1999).

5.4.4 EDUCATION
- Erect interpretive signage for Aboriginal heritage sites if appropriate (subject to the permission and cooperation of the relevant Aboriginal community).
- Erect interpretive signage for European heritage sites where appropriate.

5.5 RECREATION
Strategies in this management area concentrate on determining recreational demands, assessing the provision of facilities, ensuring appropriate foreshore land is available for public use and preventing and repairing damage.

5.5.1 MANAGEMENT OBJECTIVE
Encourage and provide facilities for appropriate recreational use of the estuary, foreshore and catchment while maintaining ecosystem viability.

5.5.2 PLANNING
Waterway
- Survey location, intensity and timing of recreational use and develop and adopt a waterway use plan identifying areas for boating use and applying boating controls, possibly through waterway zoning.
- Survey public access points including beaches, jetties, boat ramps and parking. Assess whether existing access is appropriately located considering environmental effects and proximity to waterway usage and whether the level of facilities including fuel supply and sewage disposal is sufficient to satisfy demand. Ensure sufficient and appropriate foreshore land is reserved for access and boating facilities.

Foreshore Open Space
- Maximise public ownership and appropriate access to Council and Crown Reserve foreshore land.
• Negotiate, as part of planning approvals, to obtain public access to, or acquire foreshore land for public access.
• Use the estuary management plan process to integrate Crown Reserve plans of management and Council plans for foreshore lands.

5.5.3 WORKS
• Rehabilitate, relocate or close degraded access points.
• Restrict public access to defined alignments (eg. access trails, boardwalks) and control environmental damage.
• Based on the access and demand survey, provide facilities such as fishing platforms, cleaning tables, bird hides, parking, picnic facilities and amenities, boat ramps and public jetties.

5.5.4 EDUCATION
• Prepare handouts for distribution at caravan parks, bait suppliers, residents and other tourist accommodation on the need for boat and foreshore users to take bait bags, drink bottles and other litter back to shore.
• Erect signage at waterway access points on the need to protect the waterway from litter and to observe speed and waterway rules.

5.6 FLOODING
The most common reason for the artificial opening of river mouth entrances is for flood mitigation. With a closed entrance, and continuing freshwater inflows from catchment streams, water levels in the river estuary can rise to a height considerably above peak tidal levels. Water levels sometimes rise rapidly but usually rise slowly over a long period of time causing disruption or damage to human activities and properties by inundating roads, residences, recreational areas and farmland.

Breaching of the entrance barrier is often undertaken by local councils and residents/farmers to relieve existing flooding problems, or as a flood strategy where it is feared that heavy rainfall will cause water levels, which are already high, to rise rapidly.

However, flooding is an important component of the hydrological and ecological processes operating in estuaries. It is likely to be especially important in maintaining the character and extent of riparian and fringing wetland vegetation communities. Regular and repeated initiation of an early breakout prior to water levels peaking may degrade wetlands and riparian vegetation, reduce fisheries production over the long term, and contribute to a decline in regional biodiversity.

5.6.1 MANAGEMENT OBJECTIVE
Minimise the impact of flooding on existing and future development while maintaining ecosystem viability.

5.6.2 PLANNING
• Describe and assess the effects of flooding on existing development and how these effects can be mitigated. Amend Council’s flood standard if necessary and include into a flooding overlay under the planning scheme.
• Restrict major development (eg. residential, commercial and tourist) through planning schemes on land subject to inundation.

5.6.3 WORKS
• Install rainfall and stream flow gauges in the catchment where appropriate and feasible.
• Flood-proof or relocate low lying assets.

5.6.4 EDUCATION
• Develop emergency evacuation procedures.
• Educate the community about the need for natural flooding (wetting) and drying processes to continue as part of the natural ecological cycles of estuaries needed to sustain estuary health.
• Encourage flood tolerant or complementary land uses on flood prone land adjacent to estuaries eg. seasonal grazing.

5.7 ESTUARY ENTRANCE
Manually opening river estuaries is undertaken mainly to relieve flooding. The effects on the estuary can include reduced scour leading to more rapid closure, disruption to the natural patterns of variation in water quality and biotic distribution and abundance, changes to aquatic faunal migration cycles and reduced frequency of inundation of adjacent wetlands.

Approvals for manual river mouth openings are controlled under the following legislation:
• Section 67 of the Water Act 1989, administered by the Corangamite Catchment Management Authority through licences;
• Section 37 of the Coastal Management Act 1995 administered by the Department of Sustainability and Environment through consents;
• Section 27 of the National Parks Act 1975, if the river mouth or access to it is within a National, State or Coastal Park; and
• Planning Schemes under the Planning and Environment Act 1987 administered by Local Councils through planning permit applications.

Licences issued under the Water Act 1989 expire after 1 year while approvals under the local planning scheme can be considered as deemed application for consent under the Coastal Management Act 1995 through referral of applications to the Department of Sustainability and Environment. The following matters are considered as part of the approvals process:
• Whether substantial rainfall has occurred in the upper catchment;
• The presence of significant instream flows moving towards the river mouth;
• Offshore winds;
• Tidal conditions;
• Social activity on the waterway;
• Effects on wildlife, flora, fisheries values and adjacent wetlands;
• Water quality;
• Long term effects;
• Presence of instream debris; and
• Cultural heritage of the area.

Strategies are directed at restoring as natural an opening regime as possible. The initial step in achieving this is surveying of low-lying assets to determine feasibility and cost of flood proofing as the opening level is raised. Entrance management policies need to be documented and integrated approvals in place, which consider ecological, social and economic impacts as well as integration of the respective legislative requirements.

A project led by Glenelg Hopkins CMA and Deakin University (in partnership with Western Coastal Board, Corangamite CMA, DSE, PV and EPA) is underway to develop a decision framework to enable managers to determine when it is appropriate to open estuary entrances. The outcome of this project will be a critical management tool in the future.

5.7.1 MANAGEMENT OBJECTIVE
Achieve as close to a natural opening regime as possible by addressing flooding, water quality, navigation, fishery and ecological concerns using means other than manual opening wherever practical.

5.7.2 PLANNING
• Establish a monitoring program to record date of opening and closing, nature of opening (natural or manual), location and width across the entrance dune, ocean water level, width and depth of channel development with time, estuary water levels through time and water velocities.
• Develop an entrance management policy considering location of past openings, extent of flooding, river height (water levels referenced to Australian Height Datum), water quality, weather conditions, sea conditions, tides, height and width of the entrance bar, navigation, fish and invertebrate recruitment, birdlife, threatened species, cultural sites and ecology.
• Assess the feasibility of providing rate or other economic incentives to landholders to tolerate longer periods of farmland inundation in order to achieve a more natural opening regime.
• Integrate the approvals for entrance openings through estuary management plans recognised under the Central West Victoria Estuaries Coastal Action Plan to ensure efficient and coordinated licensing and consent issuing procedures under Section 67 of the Water Act 1989, the Planning and Environment Act 1987, the Coastal Management Act 1995 and the National Parks Act 1975, where appropriate.

5.7.3 WORKS
• Survey assets below the expected maximum flood levels and either flood proof, relocate with the purpose of raising the level at which an entrance is opened or preferably not interfering in the entrance breakout process at all.
• Monitor channel changes and alter channel breakout locations as required.

5.7.4 EDUCATION
• Educate the community, Committees of Management and management agencies on the importance of not illegally opening an estuary entrance and the consequent liability to prosecution if caught.
• Educate the community about the need for natural flooding (wetting) and drying processes to continue as part of the natural ecological cycles of estuaries needed to sustain estuary health.

5.8 SEA LEVEL RISE
In 2002 the Victorian Government commissioned the CSIRO to undertake a regional assessment of climate change impacts for Victoria. These projections indicate that by 2070 sea level in the region will rise from 7 to 55 centimetres (0.8 to 8 centimetres per decade) (Great Ocean Road Regional Strategy, 2004).

The predicted effects of greenhouse changes on water bodies where they meet the sea, or on a lagoon or estuary that flows into the sea, have been described as ‘backwater’ effects and apply to rivers, creeks, estuaries and lagoons as well as drains. A sea level rise may enlarge and deepen estuaries, increasing tidal exchange, the impact influenced by changes in river discharge, estuarine morphology and the sediment budget in the littoral drift. Changes to the sediment budget may offset enlargement of the tidal inlet cross-sectional area, through greater sediment infilling at the inlet entrance.

Estuary deepening may increase the risk of flooding of adjacent low lying areas; where the groundwater is related to sea level, more salt may penetrate into underground aquifers. As estuaries deepen, greater saltwater intrusion into these hydrological systems may occur, with considerable effects on the biological communities including vegetation, bird and fish species.

Another impact will be the landward migration of coastal wetlands as they adjust to changes in tidal inundation patterns. Where embankments, seawalls or cliffs prevent retreat, coastal wetland vegetation may become reduced or completely disappear, affecting local wildlife habitats. If the sediment level in the coastal wetland and the sea level rise at similar rates, the coastal wetlands may change only marginally.

Strategies that can deal with this issue are prevention of development close to shorelines, dune systems and wetlands. Prevention of seawall development and artificial structures that may prevent vegetation migration associated with changed inundation patterns.
5.8.1 MANAGEMENT OBJECTIVE
Actively manage risk associated with predicted sea level rise within estuaries.

5.8.2 PLANNING
• Identify required set back zones to allow for 1:100 year storm events and high estuary water levels due to entrance closures. Also allow for Greenhouse sea level rise with setbacks and/or building height level controls.
• Implement appropriate planning scheme policies and overlays which control development from occurring in zones which are sensitive to predicted risk from sea level rise.
• Buffer areas should be required as part of planning policy in order to prevent structures which may prevent coastal wetland migration associated with altered tidal inundation patterns.

5.8.3 WORKS
• Investigate options for the identification and removal of obstructions eg. seawalls, floodgates etc. within the estuary to water and tidal movement and the ability of coastal wetland vegetation to migrate.

5.8.4 EDUCATION
• Prepare education information about the process of sea level rise and its implications for estuaries and their habitats.

5.9 FISHING
Management of river mouth openings can have major impacts of fishing conditions in estuaries. Regular opening can lead to a decline of fisheries by providing frequent opportunities for fish species to “escape” out to sea, while closed entrances over long periods of time can result in the loss of estuarine and marine species as water becomes fresh over time. It is extremely difficult to manipulate entrance opening with any certainty of enhancing fish recruitment and production without further research into the environmental variables and fish breeding cycles and requirements.

Harvesting activities associated with eel fishing can create problems with the emphasis on migrating eels which are the brooding stock being taken out of the estuary. Fishing pressure associated with recreational and commercial fishing requires research to determine the impacts of these activities on the fishery stocks and fish habitat areas.

Aquaculture potential also requires assessment particularly for the bait industry and fin fish culture and fish stocking using estuarine fisheries.

5.9.1 MANAGEMENT OBJECTIVES
Manage recreationally important fish and invertebrate species at levels that can be sustainably harvested, whilst protecting the aquatic ecosystem.

5.9.2 PLANNING
• Determine the recreational fish catch using creel survey, assess the level of available fish stocks, identify impact of fishing activity on the ecosystem and enforce fishing regulations.
• Determine the commercial fish catch to assess the level of available fish stocks, identify impact of fishing activity on the ecosystem and enforce fishing regulations.
• Identify important fish habitat areas within the estuary and develop planning and management policies and guidelines to protect and improve fish habitat areas.
• Assess the potential for aquaculture including the environmental impacts such as sediment quality, siltation, currents and visual effects, nutrient impacts and potential of introducing exotic species and prepare an aquaculture management plan.
• All aquaculture proposals must be based on Ecologically Sustainable Development principles.

5.10 VISUAL AMENITY
The vista from or across an estuary has important social and economic value for residents and tourists. In addition, estuaries contribute towards the landscape character of coastal areas. Landscape character of estuaries should be protected from development which may dominate or dramatically alter landscape quality.

5.10.1 MANAGEMENT OBJECTIVE
Maintain the quality of visual diversity and experience of the natural landscape from the waterway and from catchment vantage points.

5.10.2 PLANNING
• Prepare a visual amenity and/or significant landscape overlay in planning schemes for estuaries which ensures that development does not detract from the visual values of estuarine systems. This work should be undertaken as part of the implementation proposals under the Great Ocean Road Regional Strategy to protect significant landscapes.
• Apply the VCC Siting and Design Guidelines for Structures on the Victorian Coast with the processing of planning applications and consent applications.
• Require that foreshore works use local native plants with harder materials such as timber or rock, subject to consideration of any culturally significant foreshore landscapes.

5.10.3 WORKS
• Provide foreshore viewing platforms and appropriate access points.
5.11 INFORMATION

As many management strategies require community participation and agreement to be implemented, the need to engage a broad cross section of interests in preparing a plan is important.

5.11.1 MANAGEMENT OBJECTIVE

Develop information systems showing current planning and development activities, the impact that all land and waterway uses have on the estuary and the contribution that the community can make to reducing adverse impacts and improving ecosystem condition.

5.11.2 EDUCATION

- Educate the community and, in particular, the landholders adjacent to the waterway or in the first row of houses behind foreshore roadways, on the value of not clearing their land or waterfront reserves to improve their own views and the penalties for illegal clearing. Put in place a "creeping backyard" program. Regenerate illegally cleared areas and erect signage as deterrents.
- Provide local native trees, shrubs and other plants for use on waterfront properties.
- Educate the community and, in particular, the landholders on the key indicators relevant to the ecological character of estuaries.
- Establish monitoring programs and issues of concern as they arise.
- Enter all flora and fauna sightings at estuary sites into relevant Victorian databases.
- Work with the Environment Protection Authority and their Stormwater Action Program education and awareness campaign.

5.12 ESTUARY MANAGEMENT PLAN FORMAT

Individual estuary management plans are non-statutory documents relying on implementation through other statutory mechanisms such as planning schemes and management plans prepared under the Coastal Management Act 1995. Accordingly, they need to be consistent in their format and structure.

5.12.1 MANAGEMENT OBJECTIVE

Develop a plan that is easily understood yet scientifically sound, sets performance targets and includes monitoring to audit performance and is readily adaptable as more information becomes available or legislation or community attitudes change.

5.12.2 PLANNING

Ensure that estuary management plans include:

- The integration of international, commonwealth, state and regional legislation, strategies and plans.
- A focus on the planning and management of an estuary, which forms a distinctive ecological unit, and integration with upstream planning and activities.
- An adaptive approach to resource management.
- A cooperative approach to management across public and private land, including a review of management and advisory arrangements, and the further encouragement of informal and formal relationships.
- A strong community role at all stages of the estuary planning and implementation process, including formal public comment sought during the development of estuary studies and management plans, and informally via the Regional Coordinating Body, community reference groups and other stakeholders.
- An inventory of existing information and where necessary and feasible the collection of new information on environmental, heritage, social and economic values, uses and issues (eg. an estuary process study which focuses on management-related research on hydrology, biology and human-related impacts).
- The identification of conservation goals to protect and improve estuary habitat and their associated wetlands, priority actions (eg. control and manage land-use activities through best practice and incentive schemes, acceptable commercial and public works and activities) and implementation responsibilities.
- How the recommendations of an estuary management plan relating to statutory controls are to be incorporated into Council planning schemes, eg. Estuary specific or LGA-wide provisions.
5.12.3 WORKS
• Develop and implement a monitoring program for each work to ensure that it performs as expected.

5.12.4 MONITORING
• Adopt a plan format, eg. ring binder, that enables review and updating on a regular basis.
• Develop and implement a monitoring program for each strategy in the management plan to assess performance and enable plan auditing at regular intervals and subsequent adaptation of the plan.
• Encourage community involvement in monitoring including for example:
  – Water quality
  – Foreshore pollutant sources
  – Bank erosion
  – Riparian vegetation
  – Flora and Fauna
  – Migratory and wader bird species
  – Stormwater outlet sedimentation rates
  – Aquatic plant growth, eg. Sedges, reeds, mangroves, saltmarsh, seagrass, epiphytes, algae
  – Entrance opening and closing
  – Recreational boat usage
  – Recreational fish catches
  – Damage to foreshore access points

5.13 DEVELOPMENT PLANNING
The strategies for this management area comprise statutory controls and cover reviewing zonings and the range of permitted and prohibited uses, conducting risk assessments of land and waterway use in accordance with the precautionary principle of Ecologically Sustainable Development and making better use of planning schemes.

5.13.1 MANAGEMENT OBJECTIVE
Continue economic development recognising the finite capacity of estuarine ecosystems to sustain change and the risks involved in change.

5.13.2 PLANNING
• Review all policies, zonings and overlays to assess the potential for each development type to impact on estuarine habitats and their flora and fauna, water quality, sedimentation and erosion. Require planning approval for land uses which potentially have adverse impacts on estuarine ecosystems, and discourage development with impacts that cannot be reasonably mitigated.
• Adopt a precautionary approach of accepting a lower level of risk (ie. a wider safety margin) for managing existing and proposed land and waterway uses affecting highly valued environmentally sensitive components of the estuarine ecosystem.
• Encourage complementary management of land adjacent to estuaries by applying zones and/or overlays that permit land uses that are compatible with protecting and sustaining estuarine habitat.
• Precedence already set shall not be used as a planning / decision tool. All development must be considered on its merits. Estuary management plans will be used as a primary referral document for all assessments in the estuary precinct.
• Conduct an analysis of the risk of damage to the estuarine ecosystem (ie. a sensitivity assessment) by each existing waterway use using environmental factors such as:
  – bank erosion;
  – trampling, propeller furrows or other physical disturbance to aquatic plants such as rushes, seagrass beds;
  – turbidity from bed disturbance;
  – noise to birdlife.

Using the results of the risk analysis, either progressively change current waterway use practices, continue to manage their sustainability, discourage them or phase them out.

New Development
• Use land and water capability assessments as input to Council’s Municipal Strategic Statements and Local Planning Policy Frameworks to define an ecologically sustainable location for development envelopes.
• Require that a site analysis plan be prepared for major planning applications for any area within or adjoining an estuary. Consider the use of the Restructure Overlay to manage development potential of old subdivisions, which may allow closer settlement. They should consider the potential impacts on estuarine values including the ecosystem, threatened species, water quality, cultural heritage, foreshore and estuary access and usage, population levels with tourist influx, public amenity and recreational fishing use.

Existing Development
• Prepare an Environmental Significance Overlay and supporting policy which provides guidelines for development and activities on public and privately owned land in and around the estuary and its tributaries with the aim of:
  • Protecting ecological communities.
  • Phase out non coastal dependent activities on Public Land.
  • Maintaining a satisfactory standard of water quality.
  • Preserving scenic quality.
  • Providing siting and design principles for new buildings and waterside structures which build upon the VCC’s Siting and Design Guidelines for Structures on the Victorian Coast.
  • Identifying locations with potential for foreshore access.
• Conduct an analysis of the risk of damage to the estuarine ecosystem (ie. a sensitivity assessment) by each existing land use or practice using environmental factors such as;
  • Soil erodibility.
  • Threats associated with storm events and sea level changes.
• Proximity to streams.
• Estuary dilution, mixing and flushing ability.
• Proximity to key estuarine habitats eg. Seagrass.
• Geomorphic maturity of the estuary and assessment of natural temporal change. Using the results of the risk analysis, either progressively change current land use practices, continue to manage their sustainability, discourage them or phase them out.

5.14 DEVELOPMENT ASSESSMENT

The following items should be considered to assist the decision making of responsible consent authorities and public land managers for planning permit applications, coastal management act consents and works on waterway approvals. Each item helps to support the implementation of the guiding principles, statement of significance, objectives and planning policy for estuaries contained under Section 2.

5.14.1 MANAGEMENT OBJECTIVE

Ensure planning assessments consider the values of estuaries.

5.14.2 PLANNING

The following items form a checklist of matters that should be addressed in applications lodged for use and development.

• The Victorian Ramsar Sites Strategic Directions Statement.
• Any approved management plan and coastal action plan.
• The Siting and Design Guidelines for Structures on the Victorian Coast (Victorian Coastal Council 1998) and the Landscape Setting Types for the Victorian Coast (Victorian Coastal Council 1998).
• The extent to which the materials, colours and external finishes of buildings conform in appearance and character with the natural features of the area (for example, the use of non-reflective roofing surfaces, muted tones and natural materials) and with any adjacent buildings.
• Existing use of land and the reason for any development in relation to existing or proposed land use.
• Where native vegetation is to be removed, the reasons for removal, and the practicality of other options, which do not require removal of native vegetation.
• The suitability of the site for the proposed development including the impact on the natural environment, any important landscape or conservation characteristics of the area, the suitability of the proposed development and the practical availability of alternative land suitable for the proposed development outside the estuary and estuarine wetland area.
• The function of the estuary and estuarine wetlands as part of a broader natural system.
• The necessity of retaining a buffer zone of vegetation in the vicinity of an estuary, watercourses, roads and property boundaries.
• The need to ensure that buildings or works do not disturb sites of Aboriginal or non-Aboriginal heritage or areas likely to contain these significant and sensitive sites.
• Fire prevention measures.
• The need for an agreement or a covenant on title to protect significant habitat and whether this should be a condition of the any approval, consent or permit.
• Potential threats to the quality, life cycle processes or functioning of aquatic and terrestrial ecosystems or native plant and animal species.
• The need to maintain the seasonality, quantity and quality of water flows through the area and through other areas with a common system of drainage.
• Potential effects of the proposal on the flow of flood waters and on flood control measures. To prevent the impacts on estuaries and estuarine wetlands from any drainage, excavation, filling and reclamation works.
• The need to minimise pollution through the establishment of best practice performance standards and monitoring regimes.
• Control of noxious and environmental weeds and pest animals, including the need to minimise the spread of weeds and soil pathogens.
• Control of domestic animals, eg. livestock, dogs, cats, by fencing and other means. The need to prevent and control soil erosion and sedimentation during construction works and/or associated with the proposed use.
• The need for ecological restoration works, fencing or revegetation using indigenous species.
• Revegetation of degraded areas with indigenous plants.
• The need for conditions on the permit or consent to prevent the detrimental area of the development on the hydrological regime, water quality, native plant or animal habitat, or scenic, cultural heritage or recreational values.
• Any comments by the Department of Sustainability and Environment or Council Planning and Environment sections.
6. Implementation

6.1 IMPLEMENTING THE CAP

The Central West Victoria Estuaries CAP will be implemented through a number of statutory, cooperative and resourcing mechanisms. The ultimate success of this document and its implementation will be reflected in the extent of community and other stakeholder ownership of the plan and its expected outcomes, and real change on the ground.

This document is valid until 2007, aligning its timeline with the Central West Victoria Regional CAP. A review of both of these documents will take place in 2007, ensuring effective monitoring and evaluation of all initiatives and actions along the coast.

Managers of public land affected by this document are required by the provision of the Coastal Management Act (1995) to take all reasonable steps to give effect to the CAP. The Victorian Planning Provisions and in turn the State Planning Policy Framework of the municipal planning schemes in the region also require planning authorities to have regard to any CAP. This document will provide strategic direction and guidance for the review and development of local policy within planning schemes, local CAPs and management plans to ensure there is consistency for matters that affect estuaries of Central West Victoria.

The implementation of the actions in this document requires a partnership approach across Commonwealth, State and local government and the regional community. This will be achieved through:

- agreement to the strategic direction, actions and lead and support responsibilities;
- improved communication and knowledge sharing;
- further development of working relationships;
- further development of formal agreements;
- sharing of resources and collectively sourcing external funds; and
- achieving continuity and consistency in policy.

The Western Coastal Board is responsible for facilitating the implementation and review of this document to ensure it remains relevant and responds to opportunities. To assist this process the Board in partnership with the CMPP Steering Committee has:

- Requested stakeholders with a responsibility for actions to identify if they have already incorporated their respective actions into workplans and allocated resources to them; and if not provide some estimate of the priority they give to the action and when they expect to complete the action.
- Developed an evaluation framework to assist the Board in reviewing the document every 12 months, and more completely within two years. This will also help stakeholders with a responsibility for actions to report what they have achieved.

A process for implementation is shown in Figure 7.

![Figure 7: Implementation and Monitoring of Coastal Action Plans](image)

6.2 PREDICTED ALLOCATION OF RESOURCES

It is recognised that the implementation of the recommended activities will be subject to the availability of resources. Resourcing of actions will occur by lead authorities and partners making every endeavour to allocate sufficient resources to their respective actions during annual reviews of budgets and works programs. Agencies will be encouraged to reference the Central West Victoria Estuaries CAP in relevant corporate and business plans. Funds will be sourced from local, regional, State and Commonwealth funding programs (e.g. NAP, NHT, CCMAs Healthy Waterways Incentives Program). Sharing of resources and applying for external funds in partnership is highly recommended particularly for issues and actions where agencies have a shared responsibility.

An indicative allocation of resources is important early in the implementation of the plan as it shows a commitment by
stakeholders and is a reference point for the yearly review. The responses provided by stakeholders will be summarised in an implementation plan. In summary, agencies responsible for implementing actions have indicated a commitment to allocating resources for a majority of actions over the next two years. Their respective actions are either part of their existing work plan or have been indicated as a future priority.

### 6.3 EVALUATION FRAMEWORK

One of the key aspects arising from development of the Regional CAP has been the matter of assessing the ‘success’ of any CAP and its recommended actions. Implementing agencies are increasingly being asked to provide evidence as to what extent outcomes have been achieved, to describe the expected and unexpected impacts of the actions they are undertaking and to find out if stakeholders’ needs have been addressed.

Experience has shown that by undertaking evaluation, the impact of the actions recommended in a CAP can be understood, and it is possible to see how the work fits within the bigger picture and provides insights about how the work could be improved. Evaluation is important for several reasons:

- it can bring about improved outcomes;
- it can help develop a more fully shared vision and foster a commitment to improvement, especially where they have involved the wider community; and
- it can lead to greater accountability to stakeholders in showing the contribution towards the triple bottom line.

One of the principles in effective evaluation is that it should be planned during program development. To provide guidance on undertaking evaluation of the actions the Steering Committee has developed an evaluation framework. This framework is based on the following assumptions:

- all stakeholders agree to the regional objectives and outcomes;
- all stakeholders agree to their role as a lead responsibility; and
- stakeholders will continue to work in partnership, and find resources to implement actions.

To evaluate the actions, changes and outcomes noted in this document, a body of evidence needs to be gathered to see if the actions are relevant, priority and achievable, and that changes are happening and are contributing to the outcome. Experience shows that the actions can be adequately measured by performance indicators, but to determine what effect the actions have had on changes and outcomes, evaluation questions play a stronger role.

The difference between performance indicators and evaluation questions is that a performance indicator is a simple statistic recorded over time, to inform managers of the success or progress of some aspect of program management. Examples of indicators might be the number of workshops held, the number of participants attending workshops or the number of planning scheme amendments adopted.

Key evaluation questions are focused questions that form the basis of data collection for an evaluation study. They are about learning and can be qualitative or quantitative. Underpinning both indicators and questions is the collection of data. An example of such monitoring mechanisms has been listed in Table 5.

### TABLE 5: MONITORING OPTIONS, WITH EXAMPLES, TO EVALUATE THE SUCCESS OF ACTIVITIES

<table>
<thead>
<tr>
<th>Asking people individually</th>
<th>Asking people as a group</th>
<th>Other ways of collecting &amp; creating data</th>
<th>Physical methods</th>
<th>Documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structured, semi-structured, unstructured or in-depth interviews</td>
<td>Focus groups</td>
<td>Photo elicitation</td>
<td>Direct measurement</td>
<td>Records, logs and diaries</td>
</tr>
<tr>
<td>Face to face, telephone or mail questionnaires</td>
<td>Story technique</td>
<td>Peer/ expert review</td>
<td>Participant and non-participant observation</td>
<td>Secondary sources, including demographic data</td>
</tr>
</tbody>
</table>

Many of the actions already being implemented will have much useful information that can be used for evaluation purposes. The framework does not purport to instruct stakeholders how they should monitor their activities, it is more of a guide to assist them to report and account for activities and agree on how they are contributing to the desired outcome.

The key evaluation question for this document is:

**What short and long-term impacts have the implementation of the Central West Victoria Estuaries Coastal Action Plan had on the condition of the regional estuarine values?**

To determine the extent to which this question can be answered, the action plan will need to be evaluated. The key evaluation question to be considered for each theme in the action plan is:

**To what extent have the actions undertaken contributed to the desired outcome?**

A model of the evaluation framework and suggested sub-questions to assist in responding to the key evaluation question are highlighted in Figure 8.
FIGURE 8: THE CONCEPTUAL FRAMEWORK FOR EVALUATING THE IMPLEMENTATION AND IMPACT OF CENTRAL WEST VICTORIA ESTUARIES CAP

CAP KEY EVALUATION QUESTION

What short and longterm impacts has the implementation of the CAP had on conditions of regional estuarine values?

How can the CAP be improved?

What were the unexpected outcomes?

INDIVIDUAL ACTION KEY EVALUATION QUESTION

To what extent have the actions undertaken contributed to the desired outcome?

What activities were undertaken?

What resources were used to undertake activities?

Who was targeted for change (if applicable) and how were they involved in the action/project?

Are people doing things differently as a result?

What were the unexpected outcomes?

What changes in knowledge, attitudes, skills and aspirations resulted from the actions?

What actions are completed?

What actions need to continue?

What actions need to be modified or dropped?

What was the reaction of those involved?
Altered flow – changes in the flow of streams and rivers from water harvesting, drainage and diversion schemes.

Aquaculture – the commercial growing of animals and plants in water.

Catchment – the area of land that drains to a watercourse.


Committee of Management – appointed under the Crown Land (Reserves) Act 1978 to manage reserved Crown land on behalf of the Minister. For coastal land, Committees are usually the local Municipality or comprise community representatives.

Crown land – unalienated public land not vested in a public authority, including land which has been temporarily or permanently reserved under the Crown Land (Reserves) Act 1978.

Development – alteration of a natural environment for the purpose of making an area more suitable for a particular use. Development can be for many purposes including conservation, recreation, industrial, tourism or residential.

Ecologically Sustainable Development – the use of a species or ecosystem, which allows the species to naturally renew.

Ecosystem – a dynamic complex of organisms in a community and their associated non-living environment.

Environmental flow – minimum flows of water (by volume and season) necessary to maintain all aquatic life.

Estuary – inlet or river mouth that is influenced by tides and freshwater inputs from the catchment.

Estuary processes – those processes that affect the physical, chemical and biological behaviour of an estuary, eg. predation, water movement, sediment movement, water quality etc…

Eutrophication – a process that develops in high nutrient water bodies. The high amount of plant growth results in high levels of composting materials which in turn diminish or remove the dissolved oxygen available in the water.

Guidelines – measures to assist coastal planners, managers and proponents to interpret principles, desired outcomes and performance measures of planning and management policy.

Planning Overlay – additional requirements to a planning zone which provide for specific development issues or policy matters.

Planning Zone – measures in a planning scheme, which determine the permissible uses of land of a given type or in a given area.

Planning Scheme – legal instrument, developed by municipalities under the Planning and Environment Act 1987, that sets out policy and requirements for use, development and protection of land. It consists of a written document and any maps and plans it refers to.

Private land – land which is under freehold tenure (privately owned).

Public land – land which is unalienated land of the Crown (Crown land) or land vested in a public authority.

Salt wedge – the wedge shaped body of saltwater that underlies freshwater in poorly mixed estuaries.

Sediment – insoluble material suspended in water that contains mainly particles derived from rock, soil and organic material.

Stormwater – runoff from land during and following rain. Stormwater transports accumulated material including litter, soil, nutrients, pathogens, chemicals, pesticides, oils and grease into waterways and ultimately the ocean.

Sustainability – a set of system conditions that can continue indefinitely.

Use – in relation to land includes use or proposed use for the purpose for which the land has been or may be reserved.

Water pollution – when the level or concentration of a contaminant is high enough to impair water quality to a degree that has an adverse affect upon any beneficial use of water.

Wetland – land where saturation by water is the dominant factor for soil type and plant/animal communities. Coastal wetlands include tidal areas, saltmarshes and mangroves.

Works – includes any change to the natural or existing condition or topography of land. Generally associated with development or management activities.
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Appendix 2

RIVER AND ESTUARY MANAGEMENT ROLES AND RESPONSIBILITIES

Department Of Sustainability And Environment
Responsibilities: Strategic direction for park and reserve management; management of all public land except parks and reserves; flora and fauna management; catchment and water management; forest management; coastal and port management; administration of the consent requirements of the Coastal Management Act; leasing; licensing and management of public land; strategic and statutory land use planning including the administration of the Victorian Planning Provisions.
Region: South West & Port Phillip

Department Of Primary Industries
Responsibilities: Provides strategic direction for fisheries management and research; agricultural services and sustainable development of Victoria’s energy and mineral resources.
Region: South West & Port Phillip

Parks Victoria
Responsibilities: Manages National, State and Coastal Parks and conservation reserves.
Regions: Victoria West & City and Bays

Southern Rural Water
Responsibilities: Service delivery – provides irrigation, drainage, salinity control, water supply, management of specific water supply catchments. Development of Streamflow Management Plans. License off-stream diversions (stock and domestic)
Region: Southern Rural Water

Regional Water Authority
Responsibilities: Service delivery – provides water and sewerage service to urban communities, management of specific water supply catchments. Referral Authority under Planning Schemes.
Region: Barwon Water

Catchment Management Authorities
Responsibilities: Development of Regional Catchment Strategies, advice in catchment management, funding for catchment management works, environmental improvement of the regions waterways including revegetation and rehabilitation, erosion control, implementation of nutrient management plan, floodplain management and issue of permits for works on waterways. CCMA is responsible for advice to the Minister about the composition of Streamflow Management Plan consultative committees. It coordinates and implements river health plans and manages river health including estuaries.
Region: Corangamite Catchment Management Authority.

Environment Protection Authority
Responsibilities: Statutory body, protection, restoration and enhancement of air, land and water quality and control of unwanted noise. Responds to pollution incidents, investigation of spills through the Pollution of Waters by oil and noxious substances. Licence sewage and other discharges, water quality monitoring, recommends State Environment Protection Policies for specified segments of the environment (SEPP -Waters of Victoria). Responds to pollution incidents, investigation of spills through the Pollution of Waters by oil and noxious substances.

Victorian Coastal Council

Coastal Boards
Responsibilities: Provides strategic regional coastal planning and management advice and co-ordinates the preparation of Coastal Action Plans.
Region: Western Coastal Board & Central Coastal Board

Local Government
Responsibilities: Service delivery – regulates local development through planning schemes, on ground works, manages urban and rural drainage. Administers planning schemes and regulate land use and development activities.
Local: City of Greater Geelong, Surf Coast Shire and Colac Otway Shire.

Committees Of Management
Responsibilities: Elected or skills based appointed members of the public, local government or Parks Victoria who undertake on ground management works.
### STAKEHOLDERS FOR CENTRAL WEST VICTORIA COASTAL & MARINE PLANNING PROGRAM

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### STEERING COMMITTEE (TO 2002)
- Cr Julie Hansen (Chair) **surf coast shire**
- Jeanette Spittle (Conservation Officer) **surf coast shire**
- Sally Hooper (Strategic Planner) **surf coast shire**
- Wendy Briggs (Environment Officer) **colac otway shire**
- Alex Shackleton (Conservation Officer) **city of greater geelong**
- Natalie Walker (Town Planner) **borough of queenscliffe**
- Lynn Murrell (Chairman) **western coastal board**
- Fiona Chandler (Executive Officer) **western coastal board**
- Grant Hull (Senior Planning Officer) **NRE/DSE – Crown Land Management**

### PREVIOUS MEMBERS
- Nick Wimbush **central coastal board**
- Raewyn Hansen, Jamie Lamour-Reid & John Wilkin **surf coast shire**
- Bruce Humphries & Gareth Smith **City of Greater Geelong**
- Rob Davis & Robert Hutchison **Colac Otway Shire**
- Rachael Robertson, Peter Mackay & Rod Newnham **Parks Victoria**
- Chris Marshall, Gil Marshall & Shaun Thomas **NRE**
- David Patmore **Environment Australia**

### SIGNATORIES TO MOU
- Chief Executive Officer **surf coast shire**
- Chief Executive Officer **City of Greater Geelong**
- Chief Executive Officer **Colac Otway Shire**
- Chairman **Western Coastal Board**
- Regional Manager **Department of Natural Resources and Environment/Department of Sustainability and Environment**
- Regional Manager **Parks Victoria**
- Executive Officer **Geelong Otway Tourism**
- Tourism Executive Officer **Corangamite Catchment Management Authority**
- Regional Manager **VicRoads**
REFERENCE GROUP (TO 2002)
Cr Julie Hansen, Peter Dorling, Jeanette Spittle, John Wilkin, Raewyn Hansen Surf Coast Shire
Robert Hutchison, Glenn Patterson, Wendy Briggs Colac Otway Shire
Bruce Humphries City of Greater Geelong
Natalie Walker Borough of Queenscliffe
Lynn Murrell Western Coastal Board
Nick Wimbush Central Coastal Board
David Patmore Environment Australia
Wayne Kayler-Thompson Tourism Victoria
Warren Chapman Barwon Coast Committee of Management
Roger Grant & Stuart Toplis Geelong Otway Tourism
Kim McGough, Geoff Forbes, Rod Duncan & Alison McFarlane Department of Infrastructure
Joan Lindros Geelong Environment Council
Joe Adamski Barwon Water
Reg Abrahams Wathaurong Aboriginal Cooperative
Tom Richards Aboriginal Affairs Victoria
Catharine Schippers Environment Protection Authority
Dianne Tilley Gordon TAFE
Jeremy Clarke Framlingham Aboriginal Trust
Rod Goring Torquay Public Reserve Committee of Management
Don Forsyth Corangamite Catchment Management Authority
Geoff Brooks NRE Port Phillip Region
Rod Newnham Parks Victoria
Ian Karutz VicRoads
Lenny Jennet Sport and Recreation Victoria
Chris Marshall NRE, Anglesea COM, Apollo Bay and Kennett River COM
Michael Cahill Sport and Recreation Victoria
Lionel Harradine Framlingham Aboriginal Trust

Hans Fankhanel Community Representative (Otway Planning Association Inc)
Joan Lindros Community Representative (Geelong Environment Council)
Alain Purnell Community Representative (Surf Coast Shire Environment Advisory Committee)

WATERWAYS WORKING GROUP (TO 2002)
Joe Adamski & Paul Northey Barwon Water
Alex Shackleton City of Greater Geelong
Don Forsyth & Tony Overman Corangamite Catchment Management Authority
Catharine Schippers & Rowan McKenzie Environment Protection Authority
Kate Maltby Parks Victoria
Shaun Cumming South West Water Assoc.
Professor John Sherwood School of Ecology & Environment, Deakin University
Leanne Gunthero Marine and Freshwater Resources Institute
Chris Marshall NRE & foreshore Committees of Management
Warren Chapman Barwon Coast Committee of Management
Rod Goring Torquay Public Reserves
Reg Abrahams Wathaurong Aboriginal Cooperative
Jeremy Clarke Framlingham Aboriginal Trust
Chris Harty NRE (SW Victoria Coastal & Marine Planning Program)
Robin Crocker Robin Crocker & Assoc Consultants Gippsland Coastal Board
Stuart Toplis Geelong Otway Tourism
Tom Richards Aboriginal Affairs Victoria
Dianne Tilley Gordon TAFE
Tracey Walker NRE
Jo Donovan Southern Rural Water
Bruce Costin Community Representative (Aire River Drainage Advisory Committee)
Colin McIntyre Community Representative (Geelong Environment Council, National Trust Landscape Committee, Save Ocean Grove Environment)
John Foss Community Representative (Surfrider Foundation, Surf Coast Branch)

STRATEGIC PLANNING WORKING GROUP (TO 2002)
Cr Julie Hansen, Sally Hooper, Jeanette Spittle Surf Coast Shire
Bruce Humphries, Ian McCartney, Alex Shackleton & Susan Williamson City of Greater Geelong
Robert Hutchison & Wendy Briggs Colac Otway Shire
Alison McFarlane Dept of Infrastructure
Kate Maltby Parks Victoria
Grant Hull, Chris Harty NRE
Lynn Murrell Western Coastal Board
Nick Wimbush Central Coastal Board
Kim McGough, Geoff Forbes & Alison McFarlane Dept. of Infrastructure
Robin Crocker Robin Crocker & Assoc Consultants Gippsland Coastal Board
Reg Abrahams Wathaurong Aboriginal Cooperative Ltd
Jeremy Clarke Framlingham Aboriginal Trust
Tom Richards Aboriginal Affairs Victoria
Warren Chapman Barwon Coast Committee of Management
Stuart Toplis Geelong Otway Tourism

42 CENTRAL WEST VICTORIA ESTUARIES COASTAL ACTION PLAN
ADDITIONAL STRATEGIES, POLICIES AND LEGISLATION AFFECTING CENTRAL WEST VICTORIA ESTUARIES

VICTORIA’S BIODIVERSITY STRATEGY: DIRECTIONS IN MANAGEMENT & OUTCOMES SOUGHT

- Restore the health of our inlets and estuaries through improved catchment management;
- Prevent the establishment and control the presence of noxious marine species;
- Reduce theft and illegal fishing methods through education and enforcement;
- Increase understanding, protection and monitoring of vulnerable habitats, particularly seagrass, mangroves and saltmarsh;
- Promote ecologically sensitive tourism that is based on maintaining the long term health of the biological assets and minimising disruption to populations;
- Increase the understanding and protection of vulnerable and threatened species, and significant sites such as seabird breeding locations;
- Ensure the ecologically sustainable harvesting and management of fisheries resources;
- Encourage the non-extractive use of our living marine resources;
- Plan for oil spill contingencies in all bays and inlets;
- Improve the environmental quality of the bays and inlets by minimising industrial waste and progressively improving sewerage treatment standards;
- Progressively improve dredging and spoil disposal; and
- Encourage sustainable and environmentally sensitive aquaculture.

Wetlands – the principal outcomes sought are;
- Maximum retention and restoration of existing wetlands, as far as possible;
- Viable wild populations of native wetland - dependent flora, fauna and ecological communities;
- A strong partnership between owners of wetlands on private land, catchment and coastal authorities and local and state government agencies that encourages wetland owners to use wetlands wisely and sustainably, restore degraded wetlands and protect wetland biodiversity; and
- An increased awareness and appreciation of wetlands by the community leading to a higher level of active participation in wetland conservation and monitoring.

CONVENTION ON WETLANDS OF INTERNATIONAL IMPORTANCE (RAMSAR CONVENTION)
- Maintain the ecological character of listed sites;
- Promote the wise use of all wetlands;
- Include wetland conservation considerations in land use planning;
- Establish nature reserves based on wetlands;
- Promote training in the fields of wetland research and management; and
- Fulfil the reporting requirements of the Convention.
- Japan – Australia Migratory Bird Agreement (JAMBA) 1974
- China – Australia Migratory Bird Agreement (CAMBA) 1986

Port Philip (Western Shoreline) and Bellarine Peninsula Ramsar Site Management Plan 2003 – Prepared by Parks Victoria to facilitate conservation and wise use of the site which includes the Barwon River estuary, so as to maintain, and where practical restore, the ecological values for which it is recognised as a Ramsar wetland. The Plan identifies values, threats and develops actions to achieve the purpose of protecting the Ramsar wetland.

WATER ACT 1989
The Water Act 1989 provides for the integrated management of water, enhancement of environmental qualities of waterways and the protection of catchment conditions. The Water Act also establishes a framework for allocating environmental flows and regulates works within rivers and waterways under a licensing system, including the mechanical opening of estuary entrances. The Corangamite CMA is responsible for licencing works in waterways (Section 67).

ENVIRONMENT CONSERVATION COUNCIL MARINE, COASTAL AND ESTUARINE INVESTIGATION
The Environment Conservation Council’s Marine, Coastal and Estuarine Investigation Final Report, (2000) states under Other Bays and Inlets: In western Victoria, estuary management is a specific focus of current coastal planning being carried out by the Western Coastal Board (Environment Conservation Council, 2000).

CORANGAMITE REGIONAL CATCHMENT STRATEGIES
The Regional Catchment Strategy prepared by the Corangamite Catchment Management Authority recognises the importance of estuaries as part of the river systems of central west Victoria and the need for their management to be integrated with the overall management of riparian ecosystems within its jurisdiction. This coordinated management can be achieved through the integration of estuary management plans into regional catchment and waterways strategies prepared by the Corangamite Catchment Management Authority e.g. Corangamite Regional Catchment Strategy, Corangamite River Health Strategy, River Health Plans.
Draft Corangamite Waterway Health Strategy 2001 – The Strategy identifies the current condition, values and threats to waterways within the Corangamite Catchment Management region and provides recommendations for targeted and voluntary rehabilitation works to protect and improve waterway health. The Strategy recognises the importance of estuary management and the need to ensure improved management for estuarine health.

HERITAGE RIVERS DRAFT MANAGEMENT PLANS
Heritage Rivers have been identified and declared under the Heritage Rivers Act 1992, which provides for the protection and management of public land contained within nominated heritage rivers. One river has been declared under the Act, which is the Aire River. Draft management plans have been prepared for these heritage rivers and are recognised under this Coastal Action Plan.

STATE ENVIRONMENTAL PROTECTION POLICIES (WATERS OF VICTORIA)
The SEPP administered through the Environment Protection Act 1970, regulates water quality and waste management. It sets a statutory framework for the protection of the uses and values of Victoria’s fresh and marine water environments. The implementation of the revised SEPP will help to ensure that catchments, rivers and coasts are managed in an integrated manner so that actions in the catchment do not have a detrimental impact on the quality of the fresh and marine water environments.

FISHERIES ACT 1995
The Act provides a legislative framework for the regulation, management and conservation of Victorian fisheries including aquatic habitats. It introduces the requirements for fisheries management to be sustainable and has provisions allowing the development of fishery management plans, which can also address fish habitat management issues including the protection and management of estuarine wetlands.

Victorian Eel Fishery Management Plan 2002 – Provides for the statewide management of commercial eel fishing. The objectives of the Plan include:
• To manage for the ecologically sustainable management of the fishery.
• To provide for the expansion of eel production through stock enhancement and aquaculture.
• To encourage an increased level of self management within the fishery.

The Plan primarily relates to the management of the fishery rather than the management of the fishery habitat. Within the Central West Victoria region the Barwon River and Aire River are the main estuaries where commercial eel fishing occurs.

FLORA AND FAUNA GUARANTEE ACT 1988
The Act provides the legal framework for the protection of Victoria’s biodiversity. The aim is to ensure that native flora and fauna survive, flourish and retain their potential for evolutionary development in the wild. Under the Act species of flora and fauna, ecological communities and threatening processes can be listed requiring the preparation of action statements which identifies management actions required to protect the listings. Key threatening processes affecting estuaries include:
• Alteration to the natural flow regimes of rivers and streams.
• Degradation of native riparian vegetation along Victorian rivers and streams;
• Increase sediment input into Victorian rivers and streams due to human activities;
• Input of Organotins to Victorian marine and estuarine waters; and
• Input of petroleum and related products into Victorian marine and estuarine environments.

VICTORIAN RIVER HEALTH STRATEGY 2002
The Strategy provides the framework for communities to work in partnership with Government to manage and restore rivers over the long term. It sets the scene for integrating efforts on rivers and ensuring the protection of their benefits. The Strategy will focus on activities that occur in the river as well as activities in the catchment as they affect the environmental condition of the river. The management approach is based on four key elements:
• Protecting the rivers that are of highest community value from any decline in condition.
• Maintaining the condition of ecologically healthy rivers.
• Achieving an ‘overall improvement’ in the environmental condition of the remainder of rivers.
• Preventing damage from future management activities.

The Strategy provides the framework for the development of regional river health strategies such as the Draft Corangamite River Health Strategy, 2004. Regional River Health Strategies provide for the protection of river health, including estuaries. This includes management of impacts of activities within catchments that may affect estuary health and function. The Victorian River Health Strategy also provides for specific management issues such as wetlands and estuaries to be addressed under related strategies such as the Victorian Coastal Strategy, wetland management plans and Coastal Action Plans such as this one.
RECOMMENDED AMENDMENTS TO IMPROVE COLAC OTWAY, SURF COAST AND GREATER GEELONG PLANNING SCHEMES

COLAC OTWAY PLANNING SCHEME

Current Planning Policy reference to Estuaries

- Clauses 21.01-03 The Nature of Land;
- 21.02 Key Influences;
- 21.04-02 The Nature of Land;
- 21.04-07 Tourism;
- 21.04-10 Apollo Bay; and
- 21.04-10 Smaller Communities of the Shire. There is no local policy dealing with estuary management issues nor is there an environmental significance overlay that covers or addresses estuary management issues.

Recommended Amendments to Improve Planning Policy reference to Estuaries

- Clause 21.01-03 The Nature of Land under The Coast and its Environs – there is a need to recognise estuaries, their values, threats and the need for integrated management;
- Under The Otway Ranges and Foothills, Land Use Determinations need to be considered in any estuary management planning;
- Clause 21.02 Key Influences – there is a need to introduce an additional dot point that recognises estuaries as an important asset for influencing planning and resource management on a sustainable basis;
- Clause 21.04-02 The Nature of the Land, under Natural Resources and Cultural Heritage Management – Under the strategy: Manage the key elements of the natural environment in a sustainable manner, include under Implementation will be achieved by – reference to estuaries under the first, second, seventh and ninth dot points. Include an additional dot point which requires that the Environmental Significance Overlay Schedule (as recommended in this Coastal Action Plan) be applied over estuaries and their adjoining land to minimise their loss and damage and maintain the function of estuaries and to ensure their sustainable management;
- The Coast and its Environs – under the first strategy include estuaries in the second dot point under Implementation will be achieved by, and add an additional dot point which ensures that outcomes of any estuary management plans be implemented and followed. Under the second strategy add an additional dot point under Implementation will be achieved by, which makes reference to implementing and having regard to any estuary management plan;
- Clause 21.04-10 Apollo Bay – under the first strategy add reference under Implementation will be achieved by, reference to protecting the natural values, vegetation and water quality of the Barham River estuary;
- Clause 21.04-10 Smaller Communities of the Shire – Kennett River, Wye River and Skenes Creek – Under the third strategy add an additional dot point under Implementation will be achieved by, reference to protecting the natural and environmental values, vegetation and water quality of Kennett River, Wye River and Skenes Creek estuaries;
- Clause 21.05 Performance Monitoring – under the table reference needs to be made to estuaries in the second paragraph under Indicator, and estuarine condition included under Target; and
- Estuaries should be included in the third paragraph under Indicator, and reference be made to estuarine condition being improved under Target.

SURF COAST PLANNING SCHEME

Current Planning Policy reference to Estuaries

- Municipal Strategic Statement under Clauses 21.05 Environment Strategy, 21.06 Landscape and Cultural Strategy, 21.10-4 The Environment (Breamlea-Torquay), 21.12-4 The Environment (Anglesea) and 21.13-4 The Environment (Painkalac Creek);
- Local Planning Policies under Clause 22.01 Coastal Development Policy;
- Schedule to the Environmental Rural Zone which outline environmental outcomes; and
- Environmental Significance Overlay Schedule 1 – Wetland and Associated Dryland Habitat Protection.

Recommended Amendments to Improve Planning Policy reference to Estuaries

- Clause 21.05-2 Vegetation and Biodiversity – Strategies – include in the sixth dot point reference to estuarine vegetation such as coastal wetlands and the issues of stormwater management and design to reduce flows;
- Clause 21.05-3 Coastal, Intertidal and Marine Environments – Strategic Basis – add estuaries in the first paragraph;
- Objective – add estuarine to the list of environments;
- Strategies – add an additional dot point which requires any development to provide buffer zones to protect estuaries from any impacts from nearby development, including biological values and water quality, add estuaries to the fourth dot point, add the issues with environmental flows in the fifth dot point and add estuaries in the seventh dot point;
- Clause 21.05-4 Streams and Wetlands – Objectives – add estuaries to the first two objectives;
- Strategies – add estuaries and coastal wetlands to the second and fourth dot points;
CENTRAL WEST VICTORIA ESTUARIES COASTAL ACTION PLAN

- Implementation Measures – add estuaries to the first dot point, add Erskine River, Moggs Creek, St George River and Cumberland River to the fourth dot point;
- Clause 21.10-4 The Environment – Strategies – dot point twelve requires clarification as it appears vague and subject to various interpretations such as whether it is encouraging drainage or trying to use future drainage systems as part open space networks/facilities;
- Clause 21.12-4 The Environment – Strategies – add an additional dot point “Ensure estuarine water quality is protected from development by providing adequate buffer zones and protection for coastal wetlands;
- Clause 22.01-3 Policy – Vegetation Cover – add estuaries in the second line of the second dot point;
- Table 2 to Clause 22.01 Vegetation Character Table – Anglesea under township vegetation policy third paragraph add reference to estuarine vegetation, Aireys Inlet under township vegetation policy in the third paragraph add reference to estuarine vegetation, Fairhaven-Eastern View under township vegetation policy in the third paragraph add reference to estuarine vegetation, Lorne under township vegetation policy in the fourth paragraph add reference to estuarine vegetation; and
- Introduce the new Schedule to the Environmental Significance Overlay as outlined in Section 4.3 or apply the existing Schedule 1 to the Environmental Significance Overlay -Wetland and Associated Dryland Habitat Protection to cover all of the following estuaries; Thompsons Creek, Anglesea River, Moggs Creek, Erskine River, St George River and Cumberland River;
- Significant Landscape Overlay Schedule 6 – Wallington Road, Ocean Grove; and
- Floodway Overlay.

Recommended Amendments to Improve Planning Policy reference to Estuaries

- Clause 21.05 Planning Principles – Natural Environment – add estuaries to the first dot point, include the Barwon River Estuary in the second dot point;
- Clause 21.11 Protection of Catchments, Waterways and Groundwater – Importance of Issues – include reference to estuaries in paragraph twelve;
- Objective 2 – include estuaries in this objective;
- Strategies – include reference to estuaries in all dot points;
- Objective 3 – Strategies – add estuarine vegetation/wetlands in the second dot point;
- Applying Zones and Overlays – add estuaries to dot points four and five;
- Undertaking Further Strategic Work – add estuaries to dot points four and five;
- Other Actions – add estuaries to dot point seven;
- Clause 21.13 Coastal Areas – Objective 3 – Strategies – add an additional dot point seeking to protect estuaries and associated wetlands;
- Objective 4 – Strategies – add reference to coastal wetlands in the third dot point;
- Objective 6 – Strategies – add reference to estuaries and coastal wetlands to the fourth dot point; and
- Clause 21.39 Monitoring and review – Strategic Achievement last row, last paragraph add reference to protecting estuaries under key element.

GREATER GEELONG PLANNING SCHEME

Current Planning Policy reference to Estuaries

- Local Planning Policies under Clause 22.03 Subdivision and Residential Development in Breamlea;
- Schedule 5 to the Environmental Rural Zone which outline environmental outcomes for Pacey’s Island near Barwon Heads;
- Environmental Significance Overlay Schedule 1 – Areas of Flora and Fauna Habitat and of Geological and Natural Interest, Environmental Significance Overlay Schedule 2 – High Value Wetlands and Associated Habitat Protection;
- Design and Development Overlay Schedule 3 – Coastal Areas;
<table>
<thead>
<tr>
<th>Estuary</th>
<th>Land Manager &amp; (Key Partners)</th>
<th>Land use</th>
<th>LAWK status</th>
<th>Planning Status</th>
<th>Planning Scheme</th>
<th>Zones</th>
<th>Overlays</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Bay Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Johanna River</td>
<td>PV, (COSS)</td>
<td>Rural/ Park</td>
<td>Unclassified</td>
<td>PCRZ covers river &amp; ERZ covers land adj</td>
<td>Colac</td>
<td>PCRZ covers river, ERZ covers land adj</td>
<td>WMO covers land adj river</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Alpe River</td>
<td>PV, (COSS, Colac Otway Shire, Alpe River Drainage Committee)</td>
<td>Rural/ Park</td>
<td>Modified</td>
<td>PCRZ covers river and adjacent national park and conservation reserves, ERZ covers other land adj</td>
<td>Colac</td>
<td>PCRZ covers river, ERZ covers land adj</td>
<td>LSO covers entrance to river, SUZ1 covers river WMO covers land adj river</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>Barham River</td>
<td>Apollo Bay/Kennett River (COSS, Southern Otway Landcare Group, GIS, SS)</td>
<td>Rural/ Park</td>
<td>Largely Unmodified</td>
<td>PCRZ covers river, ERZ covers land adj, entrance is unzoned below the GOR with PRZ covering the adj banks</td>
<td>Colac</td>
<td>PCRZ covers river, ERZ covers land adj</td>
<td>LSO and River Overlay covers land adj</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>Wild Dog Creek</td>
<td>Apollo Bay/Kennett River (COSS, Southern Otway Landcare Group, GIS, SS)</td>
<td>Park/ Forest</td>
<td>Unclassified</td>
<td>PCRZ covers creek, ERZ covers land adj</td>
<td>Colac</td>
<td>PCRZ covers creek, ERZ covers land adj</td>
<td>EMO covers land adj river</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>Shenstone Creek</td>
<td>Apollo Bay/Kennett River (COSS, Southern Otway Landcare Group, GIS, SS)</td>
<td>Urban/ Largely Unmodified</td>
<td>Colac</td>
<td>PCRZ covers creek, ERZ covers land adj</td>
<td>Colac</td>
<td>PCRZ covers creek, ERZ covers land adj</td>
<td>EMO covers the creek upstream, LSO covers all of creek</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>Grey River</td>
<td>PV, Apollo Bay/Kennett River (COSS, SS)</td>
<td>Park/ Forest</td>
<td>Largely Unmodified</td>
<td>PCRZ covers river, ERZ covers land on West side of river</td>
<td>Colac</td>
<td>PCRZ covers river, ERZ covers land adj</td>
<td>EMO covers land adj west side of river, WMO covers land adj west side of river</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>Kennett River</td>
<td>Apollo Bay/Kennett River (COSS, GIS, SS)</td>
<td>Urban/ Largely Unmodified</td>
<td>Colac</td>
<td>PCRZ covers all of river including the entrance, TZ covers land adj part of river, ERZ covers part of land adj river</td>
<td>Colac</td>
<td>PCRZ covers all of river, ERZ covers land adj south side of river</td>
<td>EMO covers river, LSO covers river</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>Wye River</td>
<td>Wye River Foreshore (COSS, GIS, SS)</td>
<td>Urban/ Largely Unmodified</td>
<td>Colac</td>
<td>PCRZ covers all of river, ERZ covers land adj south side of river</td>
<td>Colac</td>
<td>PCRZ covers all of river, ERZ covers land adj south side of river</td>
<td>EMO &amp; SS covers all of river</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>YES</td>
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<td>YES</td>
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<tr>
<td>Separation Creek</td>
<td>Wye River Foreshore (COSS, GIS, SS)</td>
<td>Urban/ Largely Unmodified</td>
<td>Colac</td>
<td>Part PCRZ &amp; ERZ</td>
<td>Colac</td>
<td>PCRZ covers creek, PRZ covers offshore</td>
<td>EMO covers creek adj creek – creek is not covered, WMO covers creek</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>Camberland River</td>
<td>Great Ocean Road Coast (COSS, SC &amp; PDL, Caravan Park reps.)</td>
<td>Rural/ Park/ Forest</td>
<td>Largely Unmodified</td>
<td>EMO &amp; SLIO covers all of river</td>
<td>Colac</td>
<td>PCRZ covers creek, PRZ covers offshore</td>
<td>EMO covers all of river</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>St. George River</td>
<td>Great Ocean Road Coast (COSS, SC)</td>
<td>Urban/ Park/ Forest</td>
<td>Near Protector</td>
<td>EMO covers all of river, ERZ covers land adj west of river</td>
<td>Colac</td>
<td>PCRZ covers river north of GOR, PRZ covers land adj south of GOR</td>
<td>SL01 covers bank adj river, WMO covers land west of river</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>Eckline Creek</td>
<td>Great Ocean Road Coast (COSS, SC, Crnrs Geelong, Camo)</td>
<td>Urban/ Largely Unmodified</td>
<td>Colac</td>
<td>PCRZ covers river north of GOR, PRZ covers land adj south of GOR</td>
<td>Colac</td>
<td>PCRZ covers river, PRZ covers offshore</td>
<td>EMO covers all of river</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>Moggs Creek</td>
<td>Great Ocean Road Coast (COSS, SC, GOR &amp; NAV, JERAR)</td>
<td>Park/ Forest</td>
<td>Unclassified</td>
<td>PCRZ covers creek, PRZ covers offshore</td>
<td>Colac</td>
<td>PCRZ covers creek, PRZ covers offshore</td>
<td>EMO covers all of river</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>Pinkaluk Creek</td>
<td>Great Ocean Road Coast (COSS, SC, GOR &amp; NAV, JERAR)</td>
<td>Urban/ Park/ Forest</td>
<td>Largely Unmodified</td>
<td>PCRZ covers creek, PRZ covers offshore</td>
<td>Colac</td>
<td>PCRZ covers creek, PRZ covers offshore</td>
<td>EMO covers all of river</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>Anglesea River</td>
<td>Great Ocean Road Coast (COSS, SC, Alaksa, Tourism &amp; Traders, EPA)</td>
<td>Urban/ Park</td>
<td>Modified</td>
<td>PCRZ covers all of river &amp; adj land, SL01 covers Alaksa site, PRCZ covers offshore</td>
<td>Colac</td>
<td>PCRZ covers all of river &amp; adj land, SL02 covers Alaksa site, PRCZ covers offshore</td>
<td>EMO1 covers creek &amp; adj land</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Spring Creek</td>
<td>Great Ocean Road Coast (COSS, SC, Spring Creek C, Camo)</td>
<td>Urban/ Rural</td>
<td>Unclassified</td>
<td>PCRZ covers all of river &amp; adj land, SL01 covers Alaksa site, PRCZ covers offshore</td>
<td>Colac</td>
<td>PCRZ covers all of river &amp; adj land, SL02 covers Alaksa site, PRCZ covers offshore</td>
<td>EMO1 covers creek &amp; adj land</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>Thompsons Creek</td>
<td>CASL, SC, Parks/Victoria (Thompson creek entry, Camo, Brunilac Assoc.)</td>
<td>Urban/ Rural</td>
<td>Modified</td>
<td>PCRZ covers river, ERZ covers land adj south of GOR adj Clk</td>
<td>Colac</td>
<td>PCRZ covers river, ERZ covers land adj south of GOR adj Clk</td>
<td>ESO1 covers creek &amp; adj land</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>Barwon River</td>
<td>Barwon Coast (COSS, PV, (CoSS, COSS, Barwon Heads Association)</td>
<td>Urban/ Rural</td>
<td>Modified</td>
<td>PCRZ, TZ (Brunilac), PRCZ (Brunilac), entrance of Thompson creek unzoned (boundary with SC)</td>
<td>Colac</td>
<td>PCRZ covers river, ERZ covers land adj south of GOR adj Clk</td>
<td>ESO1 covers creek &amp; adj land</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
</tbody>
</table>

**TABLE 6: SUMMARY OF ESTUARY LAND AND PLANNING STATUS, VALUES AND ISSUES FOR THE CENTRAL WEST REGION**

1=Land Use & Development pressure
2=Incons mgt Pract.
3=Recreational Press
4=Littering
5=Lack of Knowledge
6=Environmental challenges
7=Unsustainable land use
8=Social issues
9=Inadequate enforcement

**Key Challenges**

**Values**

1=natural
2=cultural & social
3=economic (refer to list in Table 2)