OCEANS OF OPPORTUNITY:

A PROPOSED STRATEGIC FRAMEWORK FOR MARINE WATERS OF WESTERN AUSTRALIA'S SOUTH COAST

Report to the Minister for Environment
August 2010

PREAMBLE

There were once two large Wargyls (snakes) who lived on the land around what is now Albany and which stretched as far as the eye could see. They lived on bird eggs and both guarded their areas very carefully. One was a greedy Wargyl and ate all of his eggs in one go and then, still hungry, began to seek out the eggs of the other Wargyl.

A huge fight began with both Wargyls biting, twisting and turning in battle. As they fought they gouged out the landscape and broke through the land and the water's edge, allowing the ocean to flood into the huge hollows. This became King George Sound which was formed around Breaksea and Michaelmas Islands and then the ocean surge created Princess Royal Harbour.

Still the Wargyls fought until both were mortally wounded. One went for the shore where it curled up and died and this became Mt Melville or Kardarup (home of the goanna). The other Wargyl, also dying, dragged itself in the other direction where it wound inland, still being followed by the ocean which filled in the hollows left behind by the dying Wargyl. This created the Kalgan River.

Finally death came to the great Wargyl and it lay down and died, spilling its blood onto the earth to create Moorillup Pool where today we find the red Wilgie or ochre. Many say the red Wilgie is the blood of the long dead Wargyl.

Menang legend as related by Noongar elder Lynette Knapp of Albany (adapted from the version told in a report titled "'Kinjarling' the Place of Rain").

One only has to hear the stories of our people to understand our special connection with nature. Our stories are about creation, nature and life and are told in the age old way - by drawings in the sand or stories in the bush - from the elders to the young.

It is known that in the beginning we were all spirit beings who helped to shape the earth and all that was on it. Some spirit beings became rocks, trees and plants whilst others became birds, animals and fish and together they created the living earth and the oceans. Everyone and everything is interconnected.

Eventually Aboriginal people were created and given the job of caring for the land, the ocean and its creatures. The land became known as the *Nonk Boodja* or mother land and the primary duty of Aboriginal people was to care for the mother earth. She is the giver and the sustainer of life; she is our mother and we must all care for our mother for she is where our spirit world begins and ends.

Our strong belief in nature, the sea and *Boodja* enables us to read and understand the spirit of nature; we read the seasons, know when rain is coming, when the fish are abundant in the ocean and the rivers. She tells us every day.

The legend above applies to the area near Albany, however, the message applies equally to all parts of the south coast. As told in the legend, the sea and the land are part of a bigger system and are inextricably linked to each other and to ourselves. What happens in the sea affects the land and vice versa. We cannot separate the two parts.

Vernice Gillies, Noongar Elder, Albany.

ACKNOWLEDGEMENTS

The South Coast Regional Marine Planning Working Group has had "front-line" responsibility for production of this strategic framework. The group comprises representatives of the following:

Department of Environment and Conservation (lead agency);
Department of Fisheries;
Former Department of Industry and Resources;
Former Department for Planning and Infrastructure;
Tourism Western Australia;
Albany Port Authority;
Department of Water;
Department of Indigenous Affairs;
Goldfields-Esperance Development Commission (representing the three south coast Development Commissions – South West, Great Southern and Goldfields-Esperance);
Western Australian Museum; and
South Coast Natural Resource Management Inc.

The Planning Working Group wishes to acknowledge the invaluable contributions made to the development of this strategic framework by the members of the South Coast Regional Marine Planning Advisory Group. Every member has willingly given substantial time and energy to the planning process, having attended over 100 hours of meetings and provided a combined voluntary contribution of approximately 1,200 hours of meeting time. The group has been a source of information and inspiration throughout the process. Members of the Advisory Group are:

Roger Lewis of Esperance (Chairman);
Terry Adams of Augusta;
Darryl Byatt of Albany;
Merv Drew of Bremer Bay / Albany;
Susie Dunn of Albany;
Warren Eaton of Manjimup / Windy Harbour;
George Ebbett of Denmark;
Vernice Gillies of Albany;
Jeni Liell-Cock of Denmark;
Alan Longbottom of Grass Patch;
Neville Mansted of Esperance;
Ron Pearson of Albany;
Elaine Siemer of Esperance; and
Garry Wellstead of Albany.

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Bob Cassie of William Bay / Perth;
Duncan Trueman of Albany; and
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We also wish to thank South Coast Natural Resource Management Inc. for providing funds to carry out the Marine Geographic Information System Information and Resource Compilation Project. This project enabled the assembly and analysis of existing marine data as well as the collection of significant new information on the south coast marine region for use in the preparation of this strategic framework. The contribution of South West Catchments Council to this project is also gratefully acknowledged.

We would like to thank the many presenters and participants at workshops and meetings held during the course of the preparation of this document and others who have provided input to the process. Your time and insights were invaluable.

Special thanks must go to Lynette Knapp and Vernice Gillies for providing the Preamble to this strategic framework.

EXECUTIVE SUMMARY

SOUTH COAST REGIONAL MARINE PLANNING

Regional Marine Planning is an initiative which involves the development of a comprehensive and integrated approach to the conservation and sustainable use of State marine waters. The aim of Regional Marine Planning is:

> *Through a partnership of Government, community and stakeholder groups, establish and promote a scientifically robust framework that:*
> - *enhances cooperation and integration between sectors;*
> - *recognises the importance of social, cultural and economic values that the marine environment can provide for current and future generations; and*
> - *protects and maintains ecological integrity and biological diversity.*

Regional Marine Planning for the south coast covers State waters from Cape Leeuwin to the South Australian border and is designed to deliver the following outcomes:

- improved coordination of existing planning and management initiatives across marine sectors;
- enhanced public ownership and understanding of marine values and their management;
- a comprehensive set of available information for use in marine planning and management;
- identification of gaps in scientific knowledge of marine processes and resources;
- strategies for conservation and use of the marine environment;
- institutional mechanisms to allocate resources and areas for and between sectoral uses;
- improved and better targeted environmental monitoring and evaluation systems to determine and interpret changes in marine resource condition;
- rationalisation of marine infrastructure to minimise impacts on marine values;
- enhanced security for sustainable access to resources by existing marine-based industries; and
- identification of opportunities for development of new sustainable, marine-based industries.

The scope of Regional Marine Planning for the south coast does not cover:

- specific marine management prescriptions or actions;
- identification of marine protected areas (including sanctuary areas or no-take zones);
- resolution of resource allocation issues such as fish resource partitioning between the commercial and recreational fishing sectors;
- restructuring of existing maritime industries;
- guarantees of access to marine resources; or
- development approvals.

As an integral part of the south coast Regional Marine Planning process, particular emphasis is being placed on assembling currently available data into a geographic information system for use in developing the strategic framework.

Regional Marine Planning on the south coast is a multi-agency process coordinated by a working group representing 10 Government agencies and a representative of the Natural Resource Management sector, with the Department of Environment and Conservation as the lead agency. Stakeholder engagement has included the following elements:

- Appointment of a 15 member Planning Advisory Group comprising representatives of key stakeholder groups drawn from towns from Esperance to Augusta, which has met 7 times;
- Community forums held in conjunction with meetings of the Planning Advisory Group in Esperance, Augusta and Denmark;
- A series of 10 community workshops held in Esperance, Kalgoorlie, Hopetoun, Bremer Bay, Albany, Kojonup, Denmark, Manjimup, Augusta and Perth;
- Workshops with commercial fishers in Esperance, Albany and Augusta;
- Workshop sessions with 8 specialists from fields not formerly represented in the process;
- Presentations to conferences and meetings of key organisations;
- An interactive Regional Marine Planning website;
- Distribution of brochures and use of information panels;

- Magazine articles on Regional Marine Planning and coverage on television, radio and newspapers;
- Distribution of an update email series to (currently) over 350 individuals and organisations;
- Letters inviting input from Local Authorities and Aboriginal organisations; and
- Informal stakeholder contact and feedback throughout the Regional Marine Planning process.

Regional Marine Planning on the south coast aims to provide a 10-year framework which can assist more detailed sectoral planning. It complements (rather than duplicating or replacing) the existing legislative responsibilities and sectoral planning processes of individual agencies. It does not deal with specific management actions or specific areas of State waters. The primary aim is to provide a strategic framework that integrates the planning and management of marine sectors on the south coast.

STRUCTURE OF THIS DOCUMENT

PART A provides the background and context for this document and sets out the vision, goals and guiding principles for Regional Marine Planning on the south coast. The process used in producing this document is also described.

PART B describes the south coast marine region and outlines the environmental, economic, social and cultural values of the region. Threats to these values are not covered in detail in this section as they are dealt with in Part C.

PART C focuses on the marine issues in the region arranged by marine sector. Under the main headings of Environment and Biodiversity; Human Use; Adjacent Lands and Waters; and Coordination, the challenges and opportunities in each subject area are detailed. Objectives and strategies are provided to indicate the way forward in each subject area. Strategies are grouped under two headings: those which promote *Sustainability* and those which promote *Cooperation and Integration* except where such distinctions are not meaningful. Each strategy is given a unique number commencing with the section number and followed by "S" (Sustainability), "C" (Cooperation) or "G" (General) and then the number in that section so that individual strategies can be easily referenced. The organisation/s proposed to be responsible for **initiating** action are listed beside each strategy (see *Appendix 1* for a list of acronyms). This entry does not necessarily list all organisations which will become involved in **implementing** the strategy as the initiators will involve others in many cases. The proposed timing of initiation for each strategy is indicated with initiation to occur in years 1-2, 3-5 or 6-10 of the 10-year life of this strategic framework. Strategies which are currently (2010) underway are also nominated and an indication is given of which broad sectors have initiated implementation of the strategy as follows:

- WAG Western Australian Government (including Local Government);
- AG Australian Government;
- SAG South Australian Government;
- NRMG Natural Resource Management Groups;
- TI Tertiary Institutions;
- Ind Industry;
- NGO Non-Government Organisations; and
- AO Aboriginal Organisations.

PART D outlines suggested mechanisms for implementing, monitoring and reviewing this strategic framework.

KEY STRATEGIES FROM THIS DOCUMENT

Proposed strategies are presented for each marine sector on the south coast and also for implementation, monitoring and review of this framework. Key strategies are listed below. A reference to the section and strategy number in the main document is shown in brackets after each strategy. A full list of strategies from this document can be found on the Regional Marine Planning website at http://rmp.dec.wa.gov.au.

Key Strategies

Coordination

1. Ensure implementation of this strategic framework is consistent with State-level marine policies (C5.1 G1).
2. In conjunction with marine stakeholders and members of the public, carry out an independently coordinated marine value and usage mapping process to assist in the allocation of marine resources among multiple users (C5.1 G2).
3. Designate a cross-sectoral Implementation Coordinating Group to oversee implementation of this strategic framework and to guide the integration of marine planning and management activities across all levels of Government, the commercial sector, marine stakeholders and members of the public (C5.1 G3).
4. Engage all marine sectors in planning and management of marine activities and developments likely to impact on the south coast marine environment or its users (C5.1 G5).
5. Coordinate the integration on the south coast of State, Local and Commonwealth marine legislation, regulation and policy through a cross-sectoral Implementation Coordinating Group (C5.2 G1).
6. Raise awareness and understanding of the legislation, regulations and policies applying to marine planning and management (C5.2 G5).
7. Incorporate this strategic framework in Government and natural resource management sector planning, management and reporting processes (C5.3 G2).
8. Incorporate this strategic framework in industry and sectoral planning and management (C5.3 G3).

Education and Research

1. Develop and implement a comprehensive regional level marine and coastal education plan incorporating curriculum-based, Government agency and community elements (C3.1 G1).
2. Encourage inclusion and promotion of a comprehensive marine component in the core school curriculum from Kindergarten to Year 12 (C3.1 G3).
3. Develop regionally-based education resources for teachers (C3.1 G4).
4. Develop an integrated marine research plan for the south coast (C3.2 G1).
5. Develop, maintain and disseminate a central register of research projects for south coast marine waters (C3.2 G5).
6. Maintain a central register of available research expertise (C3.2 G9).
7. Continue to develop and maintain a Geographic Information System housing all available data relevant to south coast marine waters for use by planners, managers and members of the public (C3.2 G14).

Environment and Biodiversity

1. Identify priority areas for marine conservation through the proposed marine value and usage mapping process (C1.1 S1).
2. Propose a review of the recommendations of the 1994 Report of the Marine Parks and Reserves Selection Working Group as part of the identification of candidate areas for marine parks and reserves for use in the proposed marine value and usage mapping process (C1.1 MPC2).
3. Determine the mix of conservation approaches (marine parks and reserves, fish habitat protection areas and other conservation measures) required to ensure marine conservation outcomes (C1.1 S3).
4. Seek to have the *Implementation Framework for Western Australia for the Australian and New Zealand Guidelines for Fresh and Marine Water Quality Monitoring and Reporting* applied to the waters of the south coast (C1.1 S19).
5. Develop a framework for estuarine sand bar management on the south coast (C1.2 S6).
6. Provide regional governance of estuaries (C1.2 C3).
7. Agree on a lead agency for managing each estuary and clarify roles to members of the public (C1.2 C4).
8. Encourage further research to identify marine ecosystems at high risk from introduced marine organisms and continue to take measures to manage risks in these areas (C1.3 S3).
9. Conduct comprehensive risk assessments to identify priorities for planning and management of marine pollution (C1.4 S1).

10. Encourage regional research into potential climate change implications for the south coast including the development of regional-scale digital elevation models and specific scenarios for the south coast region (C1.5 S1).
11. Facilitate the further development of sustainable renewable energy options on the south coast, particularly through harnessing wave, tidal and wind power (C1.5 S7).

Human Use

1. Prepare and implement a single ecosystem-based fisheries management plan for State and Commonwealth waters of the south coast (C2.1 C1).
2. Facilitate ongoing communication between recreational, commercial and Aboriginal fishers through a cross-sectoral Implementation Coordinating Group (C2.1 C2).
3. Promote the development of a code of conduct for recreational fishers accessing fishing locations on the coast (C2.2 C7).
4. Provide public education programs about the commercial fishing industry, its management, its economic and consumer benefits and its impacts (C2.3 S7).
5. Determine the full economic value of south coast commercial fisheries and disseminate this information within the community (C2.3 S11).
6. Seek finalisation of the Aboriginal Fishing Strategy (C2.4 S5).
7. Encourage further research into sustainable marine aquaculture developments suited to the south coast (C2.5 S3).
9. Ensure integrated planning for marine-based infrastructure along the south coast (C2.5 C3; C2.12 C3; C2.14 C4).
8. Expand public education programs on the values and protection of Aboriginal sites (C2.6 S3).
9. Investigate the use of an interactive web-based application to enable field operatives to update maritime heritage databases (C2.7 S3).
10. Establish a Memorandum of Understanding between the Department of Environment and Conservation, the Department of Fisheries and the Western Australian Maritime Museum for the monitoring and management of maritime heritage sites by agency staff (C2.7 C2).
11. Prepare a 20-year plan for ports, freight access and shipping on the south coast including identifying potential new port sites for incorporation into future marine planning and reservation processes (C2.8 S1).
12. Provide adequate permanent moorings in areas of high small boat usage (C2.9 S6).
13. Encourage the further development of and adherence to codes of conduct to reduce impacts of recreation on the environment and other users (C2.9 S7).
14. Plan on a whole-of-Government basis for necessary coastal infrastructure to support tourism (C2.10 C4).
15. Establish a multi-agency coordination group for the south coast to work with charter boat operators to ensure effective management of their operations (C2.11 C1).
16. Encourage consideration of the designation of a lead Government agency for charter boat management (C2.11 C4).
17. Enhance opportunities for collaborative engagement of marine stakeholders and members of the public in the assessment and ongoing management of resource development projects (C2.12 S1).
18. Continue to foster strategic environmental, economic and social assessment of all proposed resource development projects (C2.12 S3).
19. Identify situations where resource development activities can co-exist with the marine parks and reserves system (C2.12 S9).
20. Maintain two-way communication with representatives of the Australian Defence Force regarding the minimisation of environmental impacts and integration of their activities with other uses of the marine environment (C.13 C2).
21. Encourage planning of renewable energy developments in conjunction with marine stakeholders and members of the public in a manner which maximises benefits to local communities while minimising adverse environmental and other impacts (C2.14 S4).
22. Support the creation of a south coast wind atlas showing feasible regional locations for wind farms both on the coast and inland (C2.14 S4).
23. Work with the Tourism Accreditation Council to address risk management in marine tourism activity provision (C2.15 G6).
24. Review current coastal access and ensure provision of adequate safe access to key sites on the coast for visitors of all abilities (C2.15 G9).

Adjacent Lands and Waters

1. Integrate planning and management of visitor facilities and opportunities in the marine and terrestrial environments (C4.1 C2).
2. Encourage consideration of inland sites for developments for which coastal locations are not essential (C4.2 S3).
3. Identify, where necessary, future sites for the development of coastal infrastructure to support marine activities, according to the anchorages identified in the *Australian Pilot Volume 1* and encourage their inclusion in Town Planning Schemes (C4.2 S4).
4. Integrate planning for coastal development across all tenures and levels of Government (C4.2 C2).
5. Encourage Local Government authorities to incorporate consideration of marine impacts and issues in their local planning and coastal development strategies (C4.2 C5).
6. Extend monitoring of the quality and quantity of catchment outflows and the resulting marine impacts and advise catchment managers of the results to assist in design of appropriate management measures (C4.3 S1).
7. Seek cooperative management agreements with Governments having jurisdiction over adjacent waters where appropriate (C4.4 S1).
8. Continue close liaison with the Australian Government planners to ensure integration of the respective marine planning processes and their implementation (C4.4 C1).
9. Maintain contact with the South Australian Government and coordinate marine planning processes for the Western Australian south coast and South Australian Eucla marine regions (C4.4 C4).
10. Integrate any future Regional Marine Planning for the west coast with this strategic framework for the south coast (C4.4 C5).

Implementation, Monitoring and Review

1. Allocate priorities to the strategies contained within this strategic framework (D1 G3).
2. Seek resources for the implementation of this strategic framework from all available sources including State, Australian and Local Governments, the natural resource management sector, the commercial sector and granting bodies (D1 G2).
3. Implement the management actions detailed in this strategic framework in order of priority, subject to availability of resources (D1 G5).
4. Involve marine stakeholders and members of the public in the development and review of priorities and make changes as required (D1 G6).
5. Monitor the effectiveness of this strategic framework and use adaptive management approaches to adjust to changing circumstances (D3 G1).
6. Engage marine stakeholders and members of the public in reviews of progress with implementation of this strategic framework and report publicly on the results (D3 G3).
7. Review both the approach outlined in this strategic framework and progress with its implementation after five years and plan continuing implementation over the second five-year period of its currency (D3 G4).
8. Develop a revised strategic framework with full stakeholder engagement after 10 years (D3 G6).

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PART A

INTRODUCTION

A1. CONTEXT FOR SOUTH COAST REGIONAL MARINE PLANNING

What is Regional Marine Planning?

Regional Marine Planning is an initiative which involves the development of a comprehensive and integrated approach to the conservation and sustainable use of State marine waters. The Minister for Environment is responsible for Regional Marine Planning and the Department of Environment and Conservation is the lead agency. Regional Marine Planning is overseen by an inter-departmental committee of agency Chief Executive Officers representing the Departments of Environment and Conservation, Fisheries and Tourism Western Australia and the former Departments of Planning and Infrastructure and Industry and Resources.

Marine environments are worthy of our protection, for the users of today as well as those of the future. At present, the complex array of uses of the marine environment is not managed in an integrated way. Different groups of users or "sectors" (detailed in Part C of this strategic framework) are carrying out their own planning and management activities in relative isolation and at different scales, while engaging with discreet stakeholder groups in the process. Government bodies, businesses, natural resource management groups and members of the public are all active in planning and managing various aspects of the marine environment and its resources. What has traditionally been lacking is cross-sectoral integration of these various activities.

Regional Marine Planning provides a focus for the integration required. The desired outcome is to achieve protection, maintenance and sustainable use of the marine environment so we can be sure that future generations will be able to continue to derive a wide range of benefits from the south coast marine region.

The aim of Regional Marine Planning is:

> Through a partnership of Government, community and stakeholder groups, establish and promote a scientifically robust framework that:
> - enhances cooperation and integration between sectors;
> - recognises the importance of social, cultural and economic values that the marine environment can provide for current and future generations; and
> - protects and maintains ecological integrity and biological diversity.

This strategic framework has been developed through the first Regional Marine Planning process in the State conducted for the south coast. It covers Western Australian State waters from Cape Leeuwin in the west to the South Australian border in the east. Regional Marine Planning for other areas of Western Australia's State waters may be considered in the light of experience with the south coast process.

National Context

The Australian Government has been undertaking Marine Bioregional Planning around Australia including preparation of a plan for the South West Marine Region which encompasses all Commonwealth waters adjacent to the State waters of the south coast (see *Adjacent Waters* and *Relationships to other Planning*).

The South Australian Government has commenced a Regional Marine Planning process for its State waters and in 2009, released provisional boundaries for 19 multiple-use marine parks for public comment as described in *Adjacent Waters* and *Relationships to other Planning*.

Regional Marine Planning provides an opportunity to link "ecosystem-based management" initiatives. This concept has been embraced throughout Australia at a State and Commonwealth level and recognises that the State's marine ecosystem is intrinsically linked with offshore Commonwealth waters and the coastal environment. It is aligned with Ecologically Sustainable Development reporting arrangements required under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Ecosystem-Based Management recognises the need to:

- identify social, environmental and economic values;
- closely involve all three levels of Government (local, State and Commonwealth);
- promote "cross-sectoral" involvement;
- prepare region-wide plans at an appropriate spatial scale;
- identify operational (measurable) objectives, outcomes and standards; and
- adopt an "adaptive management" approach i.e. maintaining the ability to move forward in planning without an absolute knowledge of all facts, but maintaining the opportunity to update and amend management arrangements in the light of monitoring results.

National documents providing context for Regional Marine Planning include:

- The *National Strategy for the Conservation of Australia's Biological Diversity (1996)* which incorporates the concept of planning at a regional scale ("bioregions"). Western Australia is a signatory to this strategy.
- The *National Strategy for Ecologically Sustainable Development* facilitates a coordinated and co-operative approach to ecologically sustainable development and encourages long-term benefits for Australia over short-term gains. It provides broad strategic directions and a framework for Governments to direct policy and decision-making.
- The *National Cooperative Approach to Integrated Coastal Zone Management, Framework and Implementation Plan* agreed by the Australian Government and all States and Territories coordinates the management of coastal issues at the National level.

Statewide Context

The Government received advice on the development of a Regional Marine Planning Policy Framework from the former State Marine Policy Stakeholder Group composed of representatives of peak non-Government organisations with interests in marine planning and management. Advice was also received from a from a Scientific Panel on Marine Policy and Planning composed of three independent, high-level scientists who were not employees of Western Australian State Government agencies.

Regional Context

The quality of marine waters, at least in the near shore areas, is affected by changes to the quality of the surface and ground waters discharged into the sea and estuaries. Of concern are changes such as a significant increase in nutrient levels and contaminants emanating from land use activities. Thus, it is important that land use activities affecting surface and ground waters are managed in conjunction with activities dependent on marine water quality including fisheries and conservation. Accordingly, this strategic framework includes consideration of land use activities within those catchments draining into the south coast marine region.

The three regional natural resource management groups adjacent to the south coast marine region (South West, South Coast and Rangelands) each have in place a strategy incorporating planning and management of marine issues (see *Administrative Frameworks* and *Relationships to other Planning*).

In 2001, a collective of local authorities on the south coast, the South Coast Management Group (Shire of Dundas to Shire of Denmark), produced a document titled *Southern Shores 2001-2002: A strategy to guide coastal and marine planning and management in the south coast region of Western Australia*. This document was the first to provide an integrated coastal and marine strategy for a significant proportion of the south coast. *Southern Shores* was revised and re-released in 2009 and specifically addresses the need for integration with this strategic framework. Local Government has been closely involved in the preparation of this strategic framework, through representation on the South Coast Regional Marine Planning Advisory Group (see *South Coast Regional Marine Planning Process*) and participation in other stakeholder engagement activities.

A2. SCOPE OF THE DOCUMENT

Regional marine planning for the south coast covers State waters from Cape Leeuwin to the South Australian border. "State waters" extend three nautical miles (approximately five kilometres) from the mainland coast and further where there are islands close to the coast. Hence, in the Recherche Archipelago group of islands, State waters extend up to approximately 30 nautical miles from the mainland (see Figure 1).

Regional Marine Planning for the south coast is designed to deliver the following outcomes:

- improved coordination of existing planning and management initiatives across marine sectors;
- enhanced public ownership and understanding of marine values and their management;
- a comprehensive set of available information for use in marine planning and management;
- identification of gaps in scientific knowledge of marine processes and resources;
- strategies for conservation and use of the marine environment;
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The scope of Regional Marine Planning for the south coast does not cover:

- specific marine management prescriptions or actions;
- identification of marine protected areas (including sanctuary areas or no-take zones);
- resolution of resource allocation issues such as fish resource partitioning between the commercial and recreational fishing sectors;
- restructuring of existing maritime industries;
- guarantees of access to marine resources; or
- development approvals.

Such issues are, however, addressed at a strategic level in this document.

Preparation of this strategic framework has not required the characterisation in space or in time of the many sectoral values and uses of the south coast marine region. Rather, it has focussed on the more strategic aspects of each sector. Implementation of many of the proposed strategies in the document will require more detailed sectoral planning and management activities and this in turn will necessitate the mapping of values and usage information.

To facilitate these processes, this strategic framework proposes "an independently coordinated marine value and usage mapping process to assist in the allocation of marine resources among multiple users" (see *Cooperation and Integration*). This mapping process is proposed to involve collaboration with marine peak bodies and other stakeholders as well as members of the public to map the spatial extent of the marine values and human uses of the south coast marine region. In some instances, the timing of particular activities and events (such as whale migrations) will also need to be captured through this process. The marine value and usage mapping process, while involving all marine sectors, would be independently coordinated under the direction of the designated coordinating group overseeing implementation of this strategic framework. This group is referred to here as the Implementation Coordinating Group or ICG (see *Cooperation and Integration* and *Implementation*).

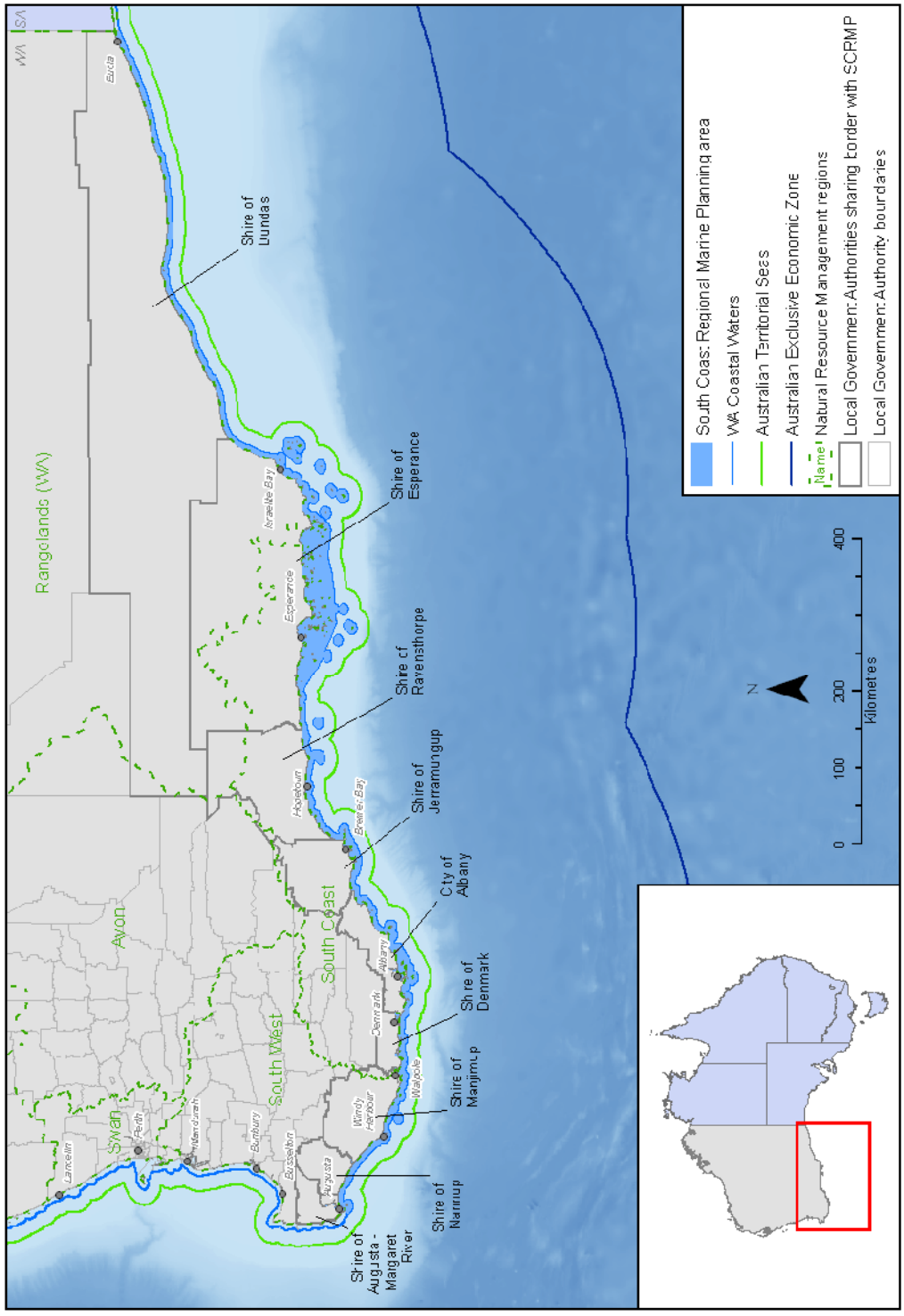


Figure 1: WA south coast marine region and administrative boundaries

For map source information see Appendix 4

The output will be layers of information on marine values and usage patterns captured in a Geographic Information System to assist in planning and management within and among sectors. For example, in planning for new marine aquaculture ventures, the information would help identify suitable sites with respect to water characteristics and the location of ocean and shore-based infrastructure. Similarly, in designing a comprehensive, adequate and representative marine protected area network, the information would help identify the variety and spatial extent of marine ecosystems requiring representation in the network as well as highlighting areas of potential overlap with other marine values and uses.

It is envisaged that the marine value and usage mapping process will provide consistent base information for use by individual sectors in their more detailed planning and management activities. As indicated throughout this document, it is also envisaged that a cross-sectoral approach will be fundamental to each of these sectoral processes under the framework it provides . The records of marine values and usage would require constant updating and re-evaluation as new information comes to light and would be considered in the annual reviews of implementation of this strategic framework outlined in *Implementation*.

A3. VISION

Users of south coast marine waters working with the broader community and managers to ensure the health of this globally significant marine environment and the production of sustainable economic, social and cultural benefits now and in the future.

A4. GOALS

1. To promote a partnership of Government, community and stakeholder groups to foster improved marine planning and management on the south coast.
2. To enhance cooperation and integration among all sectors affecting the south coast marine environment through complementing, rather than duplicating, existing sectoral planning.
3. To recognise the importance of social, cultural and economic values that the south coast marine environment can provide for current and future generations.
4. To protect and maintain ecological integrity and biological diversity of the marine environment on the south coast.
5. To integrate planning and management for State marine waters on the south coast with that for adjacent waters, islands, coasts and catchments.
6. To promote ecologically sustainable development and use of marine and coastal resources for the benefit of present and future generations.
7. To utilise the best available information as the basis for marine planning and management while constantly gathering new information.

A5. GUIDING PRINCIPLES

1. **Engaging:**
   Involving all people with an interest in the future of the marine environment.
2. **Educating:**
   Increasing community awareness and appreciation of the marine environment and its worth.
3. **Conserving:**
   Protecting and restoring marine ecosystems, biodiversity and processes.
4. **Sustaining:**
   Deriving a flow of benefits from the marine environment without compromising future opportunities.
5. **Utilising:**
   Facilitating sustainable extraction of marine resources.
6. **Integrating:**
   Planning and managing cooperatively with all interests.

7. **Understanding:**
   Gathering, disseminating and utilising scientific, economic, social and cultural information about the marine environment and its uses.
8. **Caring:**
   Facilitating active participation by marine stakeholders and members of the public in the sustainable management of the marine environment.
9. **Adapting:**
   Using adaptive management to adjust to changing circumstances.
10. **Implementing:**
    Progressing the implementation, monitoring and review of this strategic framework through the provision of adequate resources and administrative arrangements.

A6. THE SOUTH COAST REGIONAL MARINE PLANNING PROCESS

Strategic approach

Regional marine planning on the south coast aims to provide a framework which can assist more detailed sectoral planning. It complements (rather than duplicating or replacing) the existing legislative responsibilities and sectoral planning processes of individual agencies. It does not deal with specific management actions or specific areas of State waters. The primary aim is to provide a strategic framework that integrates the planning and management of marine sectors on the south coast.

The document discusses spatial issues connected with different uses of the marine environment, but does not delineate any "zones".

This strategic framework does not attempt to determine the location of marine parks and reserves or to resolve resource allocation issues such as fish resource partitioning between commercial and recreational fisheries. Such issues, however, have been canvassed with marine stakeholders and members of the public and are addressed at a strategic level in the document.

Partnerships

Regional Marine Planning on the south coast is being delivered through a multi-agency process coordinated by a working group representing 10 Government agencies and the Natural Resource Management sector as follows:

Department of Environment and Conservation (lead agency);
Department of Fisheries;
Former Department of Industry and Resources;
Former Department for Planning and Infrastructure;
Tourism Western Australia;
Albany Port Authority;
Department of Water;
Department of Indigenous Affairs;
Goldfields-Esperance Development Commission (representing the three south coast Development Commissions – South West, Great Southern and Goldfields-Esperance);
Western Australian Museum; and
South Coast Natural Resource Management Inc.

As the lead agency, the Department of Environment and Conservation is operating through its Marine Policy and Planning Branch and is working collaboratively with other key Government agencies. The Working Group is involving interested parties throughout the Regional Marine Planning process using a partnership approach in which two-way communication provides for direct stakeholder involvement in developing this strategic framework.

Stakeholder Engagement

The objective is to engage the broadest possible range of marine stakeholders and members of the public in the south coast Regional Marine Planning process. The centrepiece of this engagement is the South Coast Regional Marine Planning Advisory Group comprising stakeholders representing a broad range of marine users drawn from communities across the south coast region.

Community and special interest workshops, meetings, calls for comment, information updates, media coverage and a website were among the methods used to engage with members of the public and specific sectoral and other interests.

In conjunction with the south coast Regional Marine Planning process, a Community Recreational Marine Usage Survey was conducted for the south coast. Respondents were asked details of their recreational use of south coast marine waters. A total of 262 survey forms were returned and the survey results for different recreational activities are presented in the relevant sections of this document.

Efforts to engage marine stakeholders and members of the public in the South Coast Regional Marine Planning process have included the following:

- Call for expressions of interest in membership of the Planning Advisory Group including newspaper advertisements and articles about Regional Marine Planning in local and state newspapers, radio and television interviews and direct appeals to stakeholder organisations.
- Appointment of a 15 member Planning Advisory Group comprising representatives of key stakeholder groups drawn from towns from Esperance to Augusta (see *Acknowledgements*). The Planning Advisory Group has met seven times in Albany, Esperance, Augusta and Denmark and considered and advised on all aspects of this strategic framework. Presentations from and workshops with various marine specialists were included in most meetings.
- Distribution of a brochure.
- Regional Marine Planning display panels at numerous events and locations along the south coast.
- Magazine articles on Regional Marine Planning in *Landscope*, *Western Fisheries*, *Coastlines*, *ProWest* and *Intersector*.
- Coverage of Regional Marine Planning in Jako's fishing column in *The West Australian* newspaper.
- A series of 10 community workshops held in Esperance, Kalgoorlie, Hopetoun, Bremer Bay, Albany, Kojonup, Denmark, Manjimup, Augusta and Perth.
- Distribution of over 1,800 fliers advertising the community workshops.
- Distribution of approximately 1,800 community marine recreation survey forms including at community workshops.
- Ten meetings of the Planning Working Group representing 10 Government agencies and South Coast Natural Resource Management Inc.
- Community forums held in conjunction with meetings of the Planning Advisory Group in Esperance, Augusta and Denmark.
- Workshops with commercial fishers in Esperance, Albany and Augusta.
- Presentations to meetings of the State Marine Policy Stakeholder Group; the Marine Scientific Panel; the Marine Parks and Reserves Authority; State Recreational Fishing Advisory Committee; Western Australian Fishing Industry Council; and South Coast Natural Resource Management Inc.
- Workshop sessions with eight specialists from fields not formerly represented in the process.
- An interactive Regional Marine Planning website.
- Provision of information on Regional Marine Planning at regional shows.
- Presentations on Regional Marine Planning at the State Coastal Conference; Making Waves Symposium; and South Coast Management Group Coastal Management Forum.
- Presentations at meetings of community organisations, interest groups and agency staff.
- Letters inviting input from Local Authorities and Aboriginal organisations.
- Representation on the Marine Planning Government Working Group which helps integrate the marine planning activities of the State and Australian Governments.
- General coverage of Regional Marine Planning and the community workshop series in newspapers and on regional radio and television.
- Distribution of an update email series to (currently) over 350 individuals and organisations.
- Informal stakeholder contact and feedback throughout the Regional Marine Planning process.

Information for Planning

Good planning requires good information. This strategic framework is based on the best available environmental, social, cultural and economic data. As an integral part of the south coast Regional Marine Planning process, particular emphasis is being placed on the assembly of currently available data into a geographic information system for use in the development of the strategic framework.

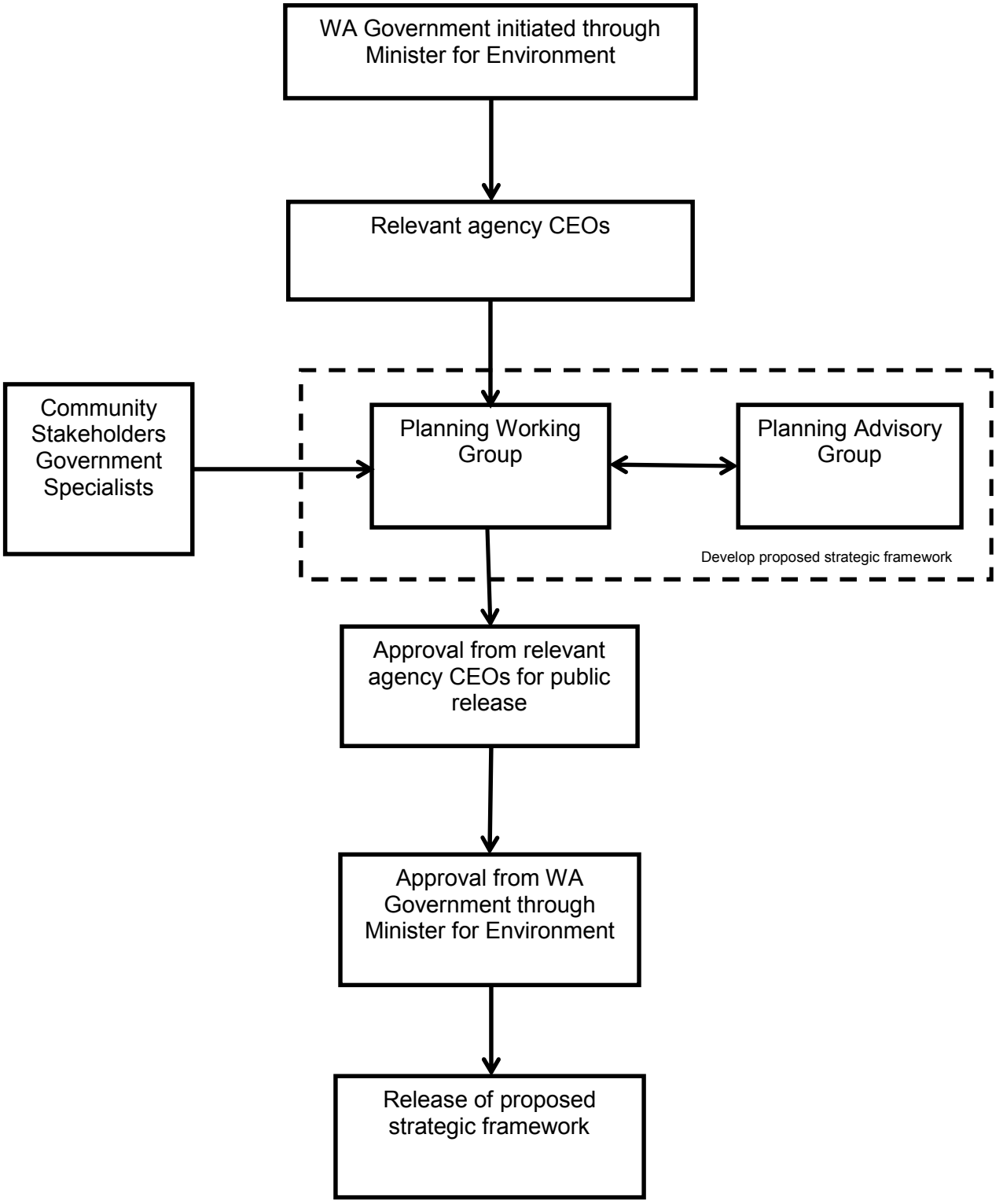
Data gaps have been identified and where possible, filled in time for use in the process. Lack of information will not prevent the preparation of strategic approaches to deal with identified issues. Rather, paucity of data has been highlighted in the strategic framework and strategies formulated to help fill any data gaps which have been identified. The strategic framework uses an adaptive management approach to take account of additional information which becomes available during the tenure of the document.

Preparing the Framework

The diagram on the next page gives a representation of the process used in preparing the strategic framework. The Working Group prepared the strategic framework utilising advice received from the Planning Advisory Group and other marine stakeholders and members of the public on the full range of marine issues on the south coast. The document was endorsed by the Planning Advisory Group.

The inter-departmental committee of agency Chief Executive Officers which oversees the Regional Marine Planning process (see *Context for South Coast Regional Marine Planning*) referred this document to agencies and key Government advisory and industry bodies for comment. In the light of this advice, the *Proposed Strategic Framework for Marine Waters of Western Australia's South Coast* was finalised and presented to the Minister for Environment.

South Coast Regional Marine Planning Process



PART B

SOUTH COAST MARINE VALUES

B1. THE SOUTH COAST MARINE REGION

The waters covered by this strategic framework stretch for approximately 2,600 km along the south coast of Western Australia and occupy an area of almost 1.75 million hectares. They are bounded in the east by South Australian marine waters and in the west by waters of the west coast of Western Australia. To the south, at the limit of State waters, Commonwealth waters extend to the 200 nautical mile territorial limit of Australia's Exclusive Economic Zone (Figure 1).

This document covers Western Australian State waters, which extend three nautical miles (approximately five kilometres) from the mainland coast and also for three nautical miles around islands that lie permanently above the high water mark. Hence, in areas such as the Recherche Archipelago, State waters extend up to approximately 30 nautical miles from the mainland coast (see Figure 1).

Major towns along the Western Australian south coast (west to east) are Augusta, Walpole, Denmark, Albany, Bremer Bay, Hopetoun and Esperance. Other towns include Windy Harbour, Peaceful Bay, Wharton, Israelite Bay and Eucla. Nine local authorities front the south coast: Augusta-Margaret River, Nannup, Manjimup, Denmark, Albany, Jerramungup, Ravensthorpe, Esperance and Dundas (see Table 1).

Table 1: Estimated Population of South Coast Local Authorities (2008)

Local authority	Population
Augusta-Margaret River	11,830
Nannup	1,325
Manjimup	9,995
Denmark	5,167
Albany	34,667
Jerramungup	1,174
Ravensthorpe	2,501
Esperance	14,443
Dundas	1,184
TOTAL	**82,286**

Source: Australian Bureau of Statistics

The coast between Cape Leeuwin and Israelite Bay is characterised by white sandy beaches separated by granite headlands. East of Israelite Bay, long sandy beaches are backed by large sand dunes until replaced by the high limestone cliffs of the southern Nullarbor Plain near the South Australian border.

Land use in the coastal hinterland varies along the coast, with a large proportion lying within conservation and local authority reserves. In the west, much of the land is forest mixed with farmland. West of Esperance, farming and plantation forestry dominate the non-reserve land, while to the east, these activities are eventually replaced by pastoralism.

There are few areas of protected water on the south coast, with the exception of Princess Royal and Oyster Harbours in Albany and a small number of permanently open estuaries. Marine waters are protected to an extent by nearshore islands around Albany and in the Recherche Archipelago. There are major ports at Albany and Esperance that underpin much of the region's economic activity and provide benefits to their local communities, catchments and the State.

The south coast has a predominantly Mediterranean climate with warm dry summers and cold wet winters. The majority of the rain falls between July and August, with Albany averaging 931 millimetres per annum and Esperance 620 millimetres per annum.

There are varied winds on the coast with a bias towards an easterly wind component in summer and a westerly component in winter. Spring and summer afternoon sea breezes are regularly experienced from directions from the south-west through to the east, however, sea breezes from the south-east or east are most common. Summer sea breezes are frequently quite fresh and can reach 25 knots (46

kilometres per hour) or more. Late autumn, winter and early spring see regular north-westerly morning winds due to a combination of the sub-tropical ridge being located to the north of Albany, with a high centred over the continent and a land-breeze effect. Cold fronts with westerly winds frequently sweep across the south coast from April to October with strong to gale force winds at times.

Waves vary across the south coast, with the western end of the region receiving the full brunt of the Southern Ocean swells but the eastern end, with its fringing islands, having less significant waves with wind-driven choppiness.

Vegetation varies with the decrease in rainfall from west to east along the Western Australian south coast, with tall forest in the west giving way to coastal heath and then the arid land vegetation of the southern Nullarbor Plain. Sixty six catchments enter the ocean along this coast, with many of the rivers entering the sea through estuaries. In general, these estuaries are seasonally or permanently open towards the western end of the region, grading to permanently (or near permanently) closed towards the east (Figure 2). River discharges are relatively low across the region and decrease with rainfall towards the east, resulting in low levels of nutrient input. This, in turn, contributes to low levels of biological productivity in south coast marine waters. Combined, these factors are responsible for the clarity of south coast marine waters.

The Western Australian south coast incorporates over 600 separate beaches and approximately 580 offshore islands, some 105 of which make up the Recherche Archipelago (see Figure 1). Depths within State waters generally decrease from west to east, with the steeper gradients in the west and shallower seafloors in the east. As a result, average swell and wave heights are greater in the west (see Figure 3).

Australia's southern coast is the longest stretch of south-facing coastline in the Southern Hemisphere and is subject to the powerful influence of the Southern Ocean. A major ocean current, the Leeuwin Current, flows from west to east. Originating in tropical northern waters, it makes its way down the Western Australian coast, wrapping around Cape Leeuwin and heading east as far as the waters of Tasmania in some years. Although the current's strength varies seasonally and from year to year, it brings warmer, nutrient-poor waters to Western Australia's south coast and has a major influence on the region's marine species and climate.

B2. ENVIRONMENTAL VALUES

The marine environment of Western Australia's south coast region has, for the most part, suffered little degradation. Much of the coastline is isolated and consequently has experienced minimal human impact. There are very few marine regions left in the world that have not been significantly degraded by human activities, making this diverse temperate region a particularly special place. Population and associated pressures on the marine environment are, however, increasing and will require careful management if the environmental values of the region are to be maintained.

The south coast marine environment includes spectacular granite reefs, limestone reefs, seagrass meadows, kelp gardens, sponge gardens, sand habitats and rich communities of filter feeders in deeper waters. It is a region of high biodiversity for a temperate zone. For example, in the Recherche Archipelago, a unique assemblage of 105 granite islands and 1,500 islets off Esperance, around 265 species of fish, 350 species of sponges and 240 species of marine algae have been identified as well as large areas containing rhodolith beds of calcareous algae. The sponge fauna of the Archipelago represent approximately 20% of the described species in Australia while the algae contribute to southern Australia's status as the region of greatest algal species richness in the world. Nearly 400 species of marine molluscs have been recorded in the Albany area alone. It is anticipated that many more species of invertebrates and plants are still to be recorded from this comparatively unexplored region.

Western Australia's south coast is an unusual marine region, in that it is influenced by the only southerly-flowing warm water current on the western coast of a southern hemisphere continent (the Leeuwin Current). Sea surface temperatures along the south coast vary between approximately 15ºC and 21ºC, warmer than expected due to the effect of the current. The additional influence of coldwater counter currents, the Cresswell and Flinders Currents, is a further distinguishing feature

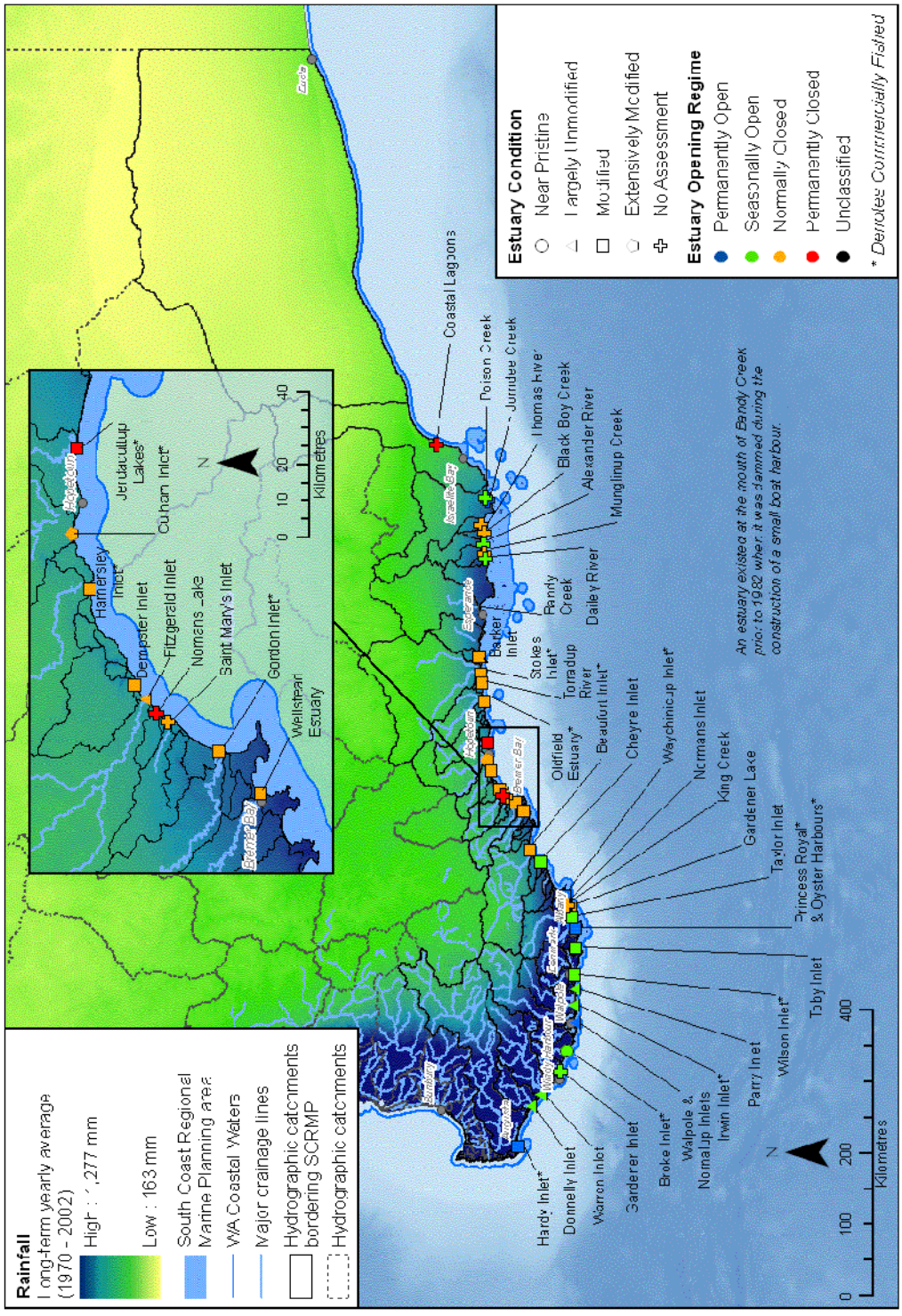


Figure 2: South coast estuaries, catchments and rainfall

For map source information see Appendix 4

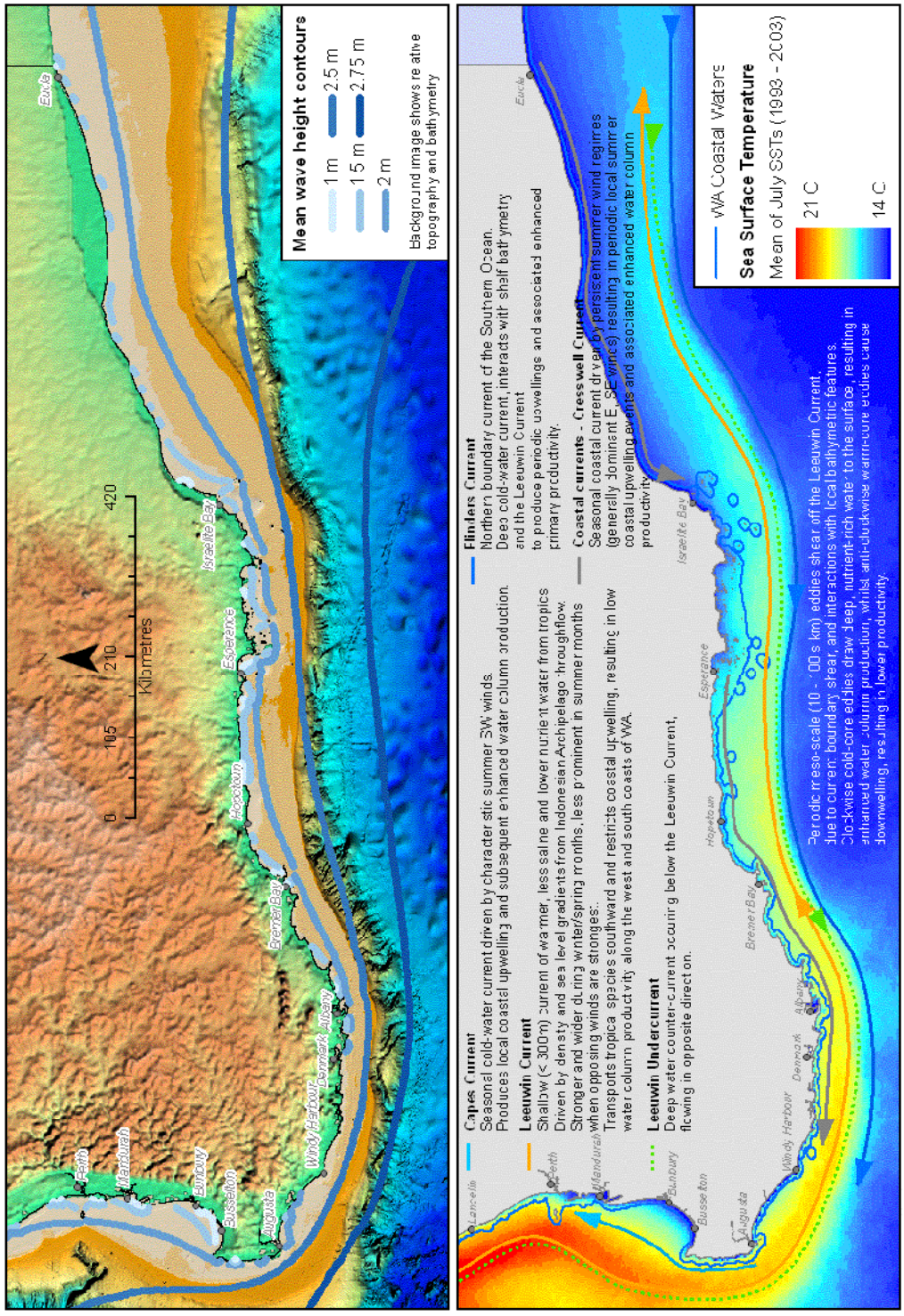


Figure 3: Mean wave heights, bathymetry and major ocean currents off the south coast

For map source information see Appendix 4

(see Figure 3). The mixture of waters results in unique assemblages of tropical, sub-tropical and temperate marine species much further south than anywhere else in the world. The biota changes from north to south with temperate species becoming more dominant further south and east. Fish stocks in these waters are predominantly temperate, with the distributions of many species extending across southern Australia. The occasional tropical fish species transported as larvae by the Leeuwin Current are unlikely to breed and establish in the cooler waters of the south coast. Climate change could potentially have large-scale effects on current temperatures and consequently the direction and depth of currents and eddies, thus impacting on the biota and habitats of the south coast region.

The region has a wide diversity of marine habitats based on varied geology, exposure, depth and relief characteristics (see Figures 20, 21 and 22). Seagrass is more abundant in sheltered waters (e.g. in Princess Royal Harbour at Albany) and marine estuaries. Macroalgal habitats are more prevalent in open, shallow waters and are dominated by the relatively small kelp *Ecklonia radiata*. Many habitat types occur in complex "mosaics" rather than as single types over extensive areas and, as a result, a rich diversity of temperate marine species has evolved in the region. An unusual feature of the seafloor is the common occurrence of hard substrates over a range of water depths, which provides attachment surfaces for sessile invertebrates and algae. Consequently, there is much higher diversity in these taxa than in many other deep water areas with predominantly soft substrates. Ancient drainage channels scour the seafloor, a reminder that sea levels were 120 metres lower some 18,000 years ago at the end of the last glacial maximum and that coastal drainage channels flowed across the current continental shelf to the shelf break.

Over 30 estuaries occur along the Western Australian south coast. These contain a variety of habitats, including mudflats, shallows, seagrass beds, rocky areas and sedgelands and they experience a wide range of salinity levels. Stokes Inlet is listed on the Register of the National Estate and Wilson Inlet, King George Sound, Princess Royal Harbour, Oyster Harbour and Beaufort Inlet are on the indicative list in recognition of their environmental significance. The lower reaches of the Blackwood River, Broke Inlet, Oyster Harbour, the Fitzgerald Inlet system and the Culham Inlet system are listed as Wetlands of National Importance in Australia's Directory of Important Wetlands. Most of the estuaries have heavily cleared catchments and suffer the effects of eutrophication and pollution from land use activities in the catchments, however, some (e.g. Broke Inlet, St Mary's Inlet) have uncleared catchments and are little altered from their natural condition. Such wild estuaries are becoming increasingly rare in Australia and worldwide. Four south coast estuaries and catchments are contained entirely within coastal national parks: St Mary and Dempster Inlets in Fitzgerald River National Park and Jorndee and Poison Creek estuaries in Cape Arid National Park.

Many estuaries of the south coast are important fish recruitment areas and provide safe habitat for juvenile fish. They are also an internationally recognised habitat for migratory and native waterbirds. While the ecological values of the estuaries are only partially understood, as few detailed studies have been conducted, there are known to be differences among them as populations of species such as black bream do not readily mix between estuaries.

Marine habitats have been mapped at a national scale through the Integrated Marine and Coastal Regionalisation of Australia (see Figures 20, 21 and 22). Australian waters have been divided into Provincial Bioregions that reflect biogeographic patterns in distributions of bottom-dwelling fish. The State waters of Western Australia's south coast contain two Provincial Bioregions, the South-west Province, which encompasses the south coast marine region from Cape Leeuwin to Israelite Bay and the Great Australian Bight Transition from Israelite Bay into South Australia. Further offshore, in Commonwealth waters, is the Southern Province.

At the so-called "meso" scale (defined using biological and physical information and geographic distance along the coast), the Integrated Marine and Coastal Regionalisation of Australia recognises three bioregions in State waters of the Western Australian south coast. These bioregions and their extent are:

Leeuwin-Naturaliste - Perth to Black Head.
Western Australian South Coast - Black Head to Israelite Bay.
Eucla - Israelite Bay to Cape Adieu.

South coast marine habitats have been mapped in detail at various locations. Studies conducted to date include habitat mapping of estuaries and parts of the Recherche Archipelago; seagrass mapping by the CSIRO; mapping by community groups; and the work of the "Securing Western Australia's Marine Futures" project. A number of marine biodiversity surveys have also been conducted by the Western Australian Museum, other Government agencies, the Centre for Marine Futures, tertiary institutions, development proponents (such as the Port Authorities) and individuals. Further environmental data has been obtained during the operation, rehabilitation and decommissioning of resource projects.

Many marine plants and animals are wide-ranging across the whole southern coastline and along the western coast, but there are large numbers of marine species that are restricted (endemic) to the south west and/ or southern temperate waters. These species include the western blue groper which ranges between eastern South Australia and Lancelin; the West Australian dhufish which ranges between the Recherche Archipelago and Shark Bay; a species of whelk which is only known from the Great Australian Bight to Albany; and a species of harp shell which has only been recorded from South Australia to just west of Esperance. Approximately 60 seagrass species are known worldwide, with some 20 of these restricted to southern Australia and nine to the south-west coast.

It is estimated that in some areas, such as the Recherche Archipelago, up to one third of the south coast fish species are endemic and also represent some of the most abundant species. Additionally, many invertebrate phyla including sponges, molluscs, crustaceans, echinoderms and ascidians have a relatively high proportion of endemic species on the west and south coasts. Macroalgae in southern Australia have among the highest levels of endemism, not only in Australia, but also the world. For many phyla, the rates of species endemicity are generally much higher along the south (and west) coast compared with the northern tropical regions, giving the south coast a distinctly Western Australian "signature". Because of their restricted range, endemic species may be vulnerable to activities that could reduce available habitats or contaminate the areas they inhabit. Many species, particularly among invertebrates and plants, can be classified as "data deficient" since they have not been studied in sufficient detail to know if they are rare or endangered.

At least 25 marine species of conservation significance also occur in the region, several of which are iconic. Included are marine mammals such as the southern right whale and the Australian sea-lion; seabirds including the southern giant petrel and shy albatross; and fish species such as the great white shark, leafy seadragon and Braun's wrasse which is only known from the area between Cheyne Beach and King George Sound. Such species can be highly vulnerable to human disturbance and development pressures.

A number of species use the south coast as an essential part of their migratory paths and as important breeding and feeding areas. For example, the southern right whale migrates from Antarctic waters to mate, calve and spend the winter months in warmer waters along the southern Australian coastline. Western Australian salmon make a westward migration along the south coast during their autumn spawning season and the Australian sardine often forms large schools near the surface along the south coast in summer, staying well submerged during winter.

Islands off the southern coast provide important refuges for terrestrial animals including birds, mammals, reptiles, insects and molluscs, many of which are threatened by introduced predators on the mainland. Seabirds and marine mammals also use islands for resting and breeding sites. Subtidal marine life around the islands receives some protection from storms and big swells. These island sanctuaries are vulnerable to increasing pressure from human usage and the risk of introduced animals, plants and diseases.

The south coast marine region is an important area for marine research because of its relatively undisturbed status, diverse habitats, unusual current systems and high diversity of marine flora and fauna for a temperate region. Much of the flora and fauna of the region has not been well studied or documented. For example, a 2007 *Southern Surveyor* survey on the south coast collected a wide diversity of molluscs from 100 to 1,000 metres depth, 20% of which were unknown or difficult for experts to identify, as were some 90% of the sponges collected in a 2007 survey conducted as part of the *Marine Futures* project. There are limited resources for biodiversity survey work but it is vitally important to improve knowledge of marine ecosystems while they are still relatively undisturbed.

Adequate time must also be allowed for study of this region with its complex ecosystems and varied habitats.

The State waters of the south coast are adjacent to relatively undisturbed deeper Commonwealth and international waters. These deeper waters incorporate a wide variety of habitats with a continental shelf which varies considerably in width, plus numerous canyons and seamounts. There is potential for integrated conservation approaches between State and Commonwealth waters. The south coast also has a significant number of coastal national parks and nature reserves which have their natural vegetation and ecological processes largely intact, which could enhance marine conservation efforts offshore.

The south coast marine region of Western Australia also has considerable potential for bioprospecting based on resources such as its diverse and extensive sponge and ascidian faunas.

B3. ECONOMIC VALUES

The south coast region of Western Australia has a relatively broad economic base with a wide range of sectors represented. Traditionally, the region relied heavily on primary production including agriculture, fishing and forestry, however, this has changed significantly over time. The region's various economic sectors are inter-linked through the "multiplier effects" of each component of the south coast regional economy.

The Ports of Albany and Esperance are central to the regional economy with most economic sectors reliant on imports and/ or exports. Both ports service large economic and social catchments along the coast and well into the hinterland, connecting them with national and international import and export markets. The Ports also provide important infrastructure for many marine activities including charter boat operations, commercial fishing and cruise ship visits.

There is a strong food and fibre sector along the south coast. In the wetter western areas of the region, grazing, horticultural products and wine are the mainstays of today's agricultural production. Moving east into drier areas, broad-acre agriculture becomes more prevalent, based largely on the traditional grain and wool industries, supplemented by plantation forestry. Over 2.2 million tonnes of agricultural products were shipped from Albany Port in 2008/09, with over 1.5 million tonnes exported through Esperance in 2007/08. There is a trend towards the replacement of livestock production with grain enterprises throughout the region, with a projected one million tonnes of grain being added to annual average production over the next decade. East of Esperance, agriculture gives way to pastoralism across the southern Nullarbor Plain.

Mineral resources are currently extracted in the south coast hinterland and further developments are proposed. Mineral exports through Esperance for the 2007/08 financial year approached the approved eight million tonnes of iron-ore. Ravensthorpe Nickel Operations exported nickel through the Port of Esperance intermittently during 2008/09 as part of its ramp up phase. Mining activity was suspended in January 2009, but following the sale of the mine in December 2009 (subject to relevant approvals), further nickel exports are anticipated. New mineral development projects proposed to commence exporting their product through Esperance Port include:

- Phillips River–Trilogy Gold mine (after 2010);
- Rare earth production from Mt Weld (2010) and
- Mt Cattlin lithium/ tantalum project (2010).

The Port of Albany's only current mineral export is silica sand (90,000 tonnes in 2008/09), however, the proposed Southdown Magnetite project east of Albany plans to export iron-ore through a slurry pipeline to the Port. There is also a current proposal to mine heavy mineral sands at Jangardup South, 30 kilometres east of Augusta. Oil and gas production and export from the region are possible in the future. Proposals for additional resource projects are also likely.

The native timber industry is concentrated west of Denmark and based on jarrah, karri, marri and a range of specialty species. Timber products are milled and value added in the region which is renowned for the production of furniture, flooring and appearance-grade products. The plantation forestry sector has grown significantly in recent years. Early plantations of pine have been overtaken

by the bluegum forestry industry based on managed investment schemes which produce wood chips for export to markets in Asia. More recently, plantations of hardwood timber species have been established in the south coast hinterland. Exports of woodchips through Albany Port grew from around 200,000 tonnes in 2002/03 to over 1.6 million tonnes in the 2008/09 financial year. Woodchip exports through Esperance Port are also anticipated to commence in the future. Value adding of the region's bluegum resource is also occurring through the production of biomass fuel pellets for export at a plant north of Albany.

The south coast marine region has been associated with commercial fishing since the early days of settlement. The industry supplies seafood and bait to consumers on the south coast as well as in Perth and other centres. Numbers of commercial fishers based on the south coast have declined in recent years but active fisheries still target abalone and other shellfish, shark, scalefish, lobsters and crabs. Total earnings to fishers from commercial fishing on the south coast in 2005/06 are estimated to be over $21 million, with the abalone and shark fisheries being the most valuable fisheries in the region. In addition to direct earnings, numerous support industries also benefit from this sector. Processing of finfish, rock lobster, deep sea crab, abalone and pilchards occurs at Esperance, Bremer Bay, Albany and Denmark. Current (2010) marine aquaculture ventures on the south coast produce abalone, oysters and mussels and further developments are planned in this sector.

Tourism has risen to be one of the south coast region's most significant economic sectors. The region attracts visitors to its forests, coastline, national parks, wildlife, heritage values and fine food and wine. An estimated 40% of domestic visitors to the south coast engage in some form of marine activity as part of their tourism experience. Estimated tourist expenditure in the South West and Esperance Tourism Areas in 2008-09 was over $900 million. Coastal towns cater to a regional catchment of Western Australian tourists who visit their "local coastal town" to access the marine environment and the region is also popular with interstate and overseas visitors. Fishing is an important attraction for many tourists who value the region's clean waters, lack of crowds and beautiful coastal scenery. Other activities include whale watching, diving, surfing, sailing, boating, island visits, windsurfing, beach-going and increasing numbers of visits by cruise ships. The tourism sector supports a wide range of associated businesses on the south coast including accommodation and food outlets, retail and fuel sales, transport provision and many other services.

The south coast region currently contributes to the State's renewable energy sector. Major wind turbines are located at Albany and Esperance with smaller facilities at Hopetoun and Bremer Bay. The region is prospective for further renewable energy projects with additional projects currently under consideration in the south coastal and marine environments being further wind turbines and bioenergy. Assessment of wave energy at a site near Albany proved that it was unsuitable for a pilot project but may be suited to eventual full-scale production. Tidal energy may be evaluated in the future, although the south coast has a low tidal range and may not be suitable.

Bioprospecting is an emerging industry throughout Western Australia and the south coast marine region has potential in this area due to the high biodiversity of its marine waters. Key prospects for this sector would include industrial chemicals, pharmaceuticals and essential oils.

Albany and Esperance are the major retail and service centres of the south coast with other centres on the coast at Hopetoun, Bremer Bay, Denmark, Walpole and Augusta. Numerous smaller towns as well as centres away from the coast provide support services to the region.

B4. SOCIAL AND CULTURAL VALUES

Aboriginal people have been intimately connected with the south coast marine region for tens of thousands of years. The oldest dated occupation sites in south west Western Australia are Devil's Lair on the Leeuwin-Naturaliste Ridge, with occupation indicated from around 30,000 years ago and a site at Upper Kalgan has been dated at 7,000 to 6,500 years old. Although not believed to have been seafarers, Aboriginal people have had a close association with and spiritual attachment to the marine environment since their arrival on these shores. The many registered sites along the coast attest to the importance of coastal and marine environments to Aboriginal people and stories, song lines and story lines abound in this country.

Six different seasons are recognised by the Aboriginal people of the south coast. In addition to social and cultural considerations, traditional life was organised around the availability of resources in each season. Movement is understood to have occurred between coastal and inland areas using rivers as "highways". The warmer summer months were spent along the coast, while the cooler months were spent further inland. The frequent occurrence of fish traps and middens along the coast indicates that fish, crustaceans and shellfish were valuable food resources for people living on the coast. Studies also indicate that seals were a seasonally important food source. There are also important cultural relationships between Aboriginal people and marine mammals including whales and dolphins, the latter having assisted with traditional salmon fishing by driving schools of fish towards the beach.

Aboriginal people of the south coast maintain their attachment to the sea. The responsibility for maintaining cultural sites, stories and songs is still being passed down the generations and cultural activities such as ceremonies and fishing are an important part of life.

European exploration of Western Australia's south coast is believed to have started by Dutch mariners in the 1600s. The Dutch ship *Leeuwin* accidentally reached WA in 1622 and sailed as far east as Point D'Entrecasteaux. Various French and British seafarers sailed along the southern shore of Western Australia in the years that followed. The earliest settlers on the south coast were sealers, whalers and fishermen. A number of listed heritage sites date from these times, including sealer's ovens and sailor's camps. The earliest whaling on the south coast commenced around 1836. In 1978 the last operating whaling station in the southern hemisphere at Albany was closed.

The first territorial claim on the south coast was made in the name of Britain by Captain George Vancouver in the Albany area in 1791. The first European settlement in what is now Western Australia was established at present day Albany in 1826 with the arrival of a small group of colonists from Sydney. The primary reason for Albany's settlement was the ready availability of a natural deepwater port.

Albany and all subsequent south coast settlements initially relied heavily on the sea for food, their livelihoods and for transport routes. This maritime heritage is evident today with initiatives such as the Albany Boat Shed, with its programs for wooden boat building, restoration, sail training, maritime heritage education and tourism activities, the Festival of the Sea at Easter in Albany and the Esperance Blessing of the Fleet. The Albany Port has a rich cultural and social history, having been the departure point for Australian troops leaving to fight in World War I. Albany Port was also an arrival port for returned troops from World War I and was the site for part of the inaugural ANZAC Day celebration.

The population of the south coast continues to grow, due in part to the "sea-change" phenomenon driven by the attractive coast, pleasant climate, recreational opportunities and lifestyle benefits and which is indicative of the value people place on living near the sea. Resource development projects are also providing encouragement to people to move to the south coast for the employment and lifestyle opportunities they provide.

Today, the sea is an important part of the culture and society of the south coast. Many residents still earn their living, at least in part, from the sea through employment in commercial fishing and aquaculture, the maritime sector through ports and shipping, marine tourism and the numerous support sectors including boat retailers, service centres and bait and tackle shops. Community organisations volunteer thousands of hours of time to services such as surf life saving, sea rescue and environmental restoration. Recreational activities centre in large part around beaches, boating and fishing and real estate prices reflect their proximity to the sea.

PART C

MARINE ISSUES

C1. ENVIRONMENT AND BIODIVERSITY

C1.1 Marine Conservation

Context

The Western Australian southern coastline is the longest south-facing land's edge in the southern hemisphere and is diverse and unique in the global context. The seasonal low-nutrient, warm water Leeuwin Current travels from the north of Western Australia southwards, around Cape Leeuwin and influences waters as far east as Tasmania. The Leeuwin Current plays a critical role in transporting some tropical and sub-tropical marine species from northern waters and influences the reproductive cycles of many others. The Leeuwin Current further limits persistent upwelling along the coast, resulting in a reduced supply of cooler nutrient-rich waters and lower bio-productivity relative to the western and southern continental shelves of other continents in the southern hemisphere.

This combination of features results in marine biota of the south coast exhibiting high species diversity for a temperate region. A globally significant proportion of marine species occur nowhere other than the south coast, which is also home to threatened species of sharks and marine birds and threatened or specially protected marine mammals. In addition, a number of species of mammal, bird and reptile, which live on islands along the south coast, are listed as threatened. The adjacent lands of the South West Botanical Province are also high in biological diversity, having been recognised as one of 34 international biodiversity hotspots and the only international hotspot in Australia. The province has been recognised for the high number of endemic species it supports, as well as the high degree of threat to biodiversity.

The south coast provides essential habitat for migratory marine species for feeding and breeding. In addition, the numerous islands (approximately 580) in the region are important refuges for many remnant terrestrial species that were once common on the mainland and for marine birds and mammals. They also provide habitat, nursery areas and protection for sub-tidal marine life. Two south coast wetlands are listed under the Ramsar Convention as wetlands of international importance for migratory wading birds. One of these, Lake Gore, abuts the southern coast.

In combination, these factors make the south coast a globally significant environment. The marine waters of the south coast also provide opportunities for the discovery of chemicals with pharmaceutical properties derived from marine life through bioprospecting (see *Resource Development*).

Due mainly to relatively low levels of development, south coast marine habitats and marine life have generally not been significantly degraded compared with marine environments elsewhere. Exceptions to this apply in some localised areas which have been more highly developed or subject to human pressures (e.g. Oyster Harbour, Albany). With increasing human population and industrial development in the region, impacts and pressures on the environment are increasing. Areas on the south coast most under pressure are generally associated with larger coastal cities and towns including Albany, Esperance and Augusta. However, smaller coastal towns such as Bremer Bay, Hopetoun, Walpole and Denmark have expanded rapidly. Together, coastal cities and towns contain the majority of the region's population. In addition to the resident population, it is estimated that over 500,000 Australian and overseas tourists visit the south coast region annually (2005-07).

Considerable research into marine biota and habitats has been conducted on Western Australia's south coast, however, further work is required before a complete picture of the marine environment will emerge (see *Marine Research*).

A number of Government agencies are involved in the conservation of the marine environment. Existing marine protected areas are shown in Figure 4. Under the *Conservation and Land Management Act 1984*, the Department of Environment and Conservation is responsible for the development and management of marine parks and reserves and for the protection of "marine fauna" (marine mammals, birds and reptiles).

The Department of Fisheries is responsible for the conservation and sustainable management of fish and fish habitat (including flora) in both the aquatic and marine environment of Western Australia. The

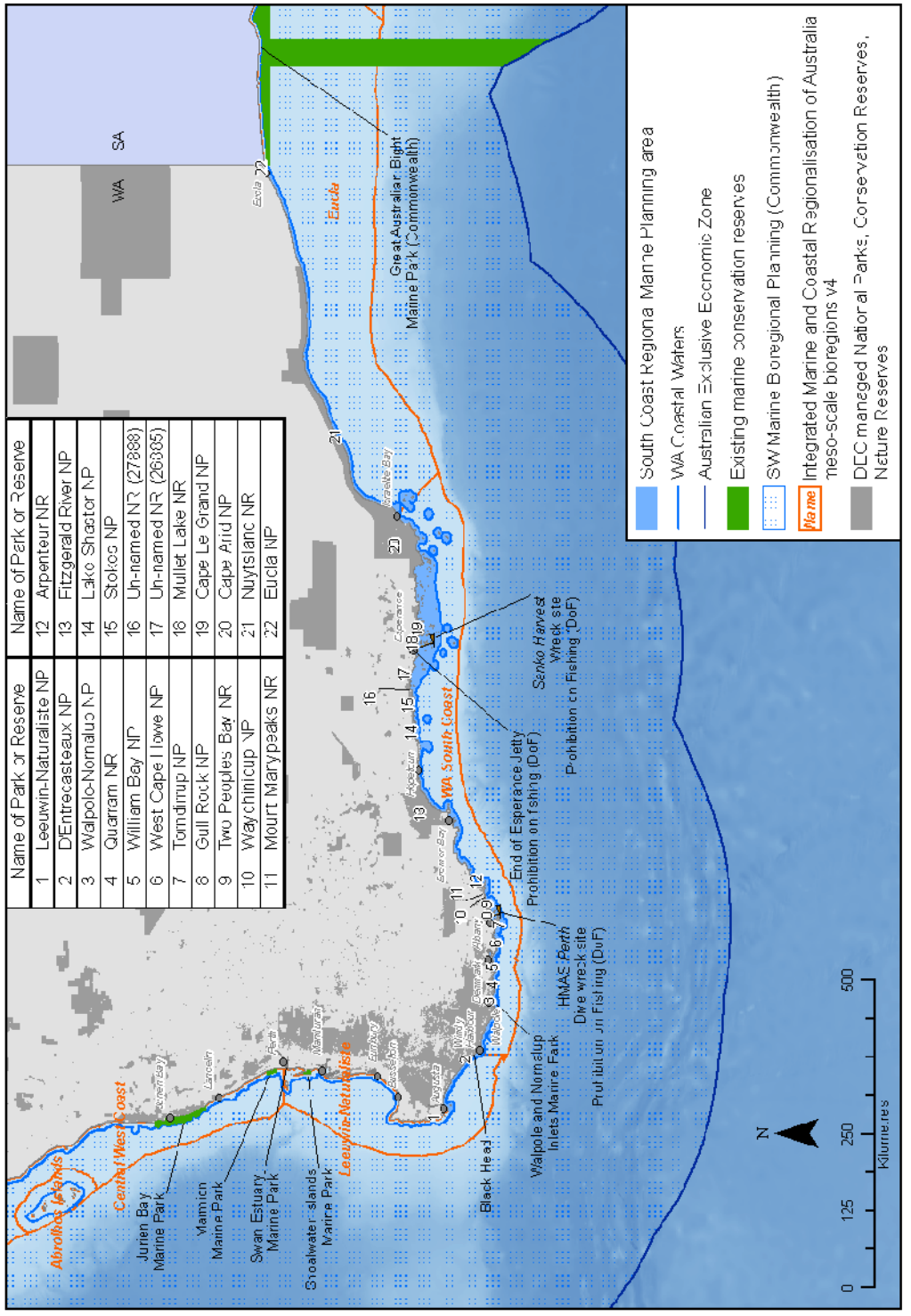


Figure 4: South coast marine and terrestrial conservation areas

For map source information see Appendix 4

Department of Fisheries works closely with the Department of Environment and Conservation in the planning and management of marine parks and reserves established under the *Conservation and Land Management Act 1984*, particularly in terms of compliance, research and education.

The Department of Fisheries also has the capacity to create marine protected areas through the declaration of "Fish Habitat Protection Areas" under Section 115 of the *Fish Resources Management Act 1994* to protect and conserve marine species and habitats. No Fish Habitat Protection Areas have been declared along the south coast to date (2010).

In addition, Section 43 of the *Fish Resources Management Act 1994* provides the power for the Minister for Fisheries to prohibit fishing or a type of fishing activity in areas of the marine environment for a range of reasons, including marine conservation. All restrictions to fishing activity as prescribed within management plans declared under the *Conservation and Land Management Act 1984* for marine parks and reserves are given effect through the *Fish Resources Management Act*. Three marine Section 43 closures totally prohibiting fishing are currently (2010) in place along the south coast: the wrecks of the HMS *Perth* near Albany and the *Sanko Harvest* near Esperance; and the end of the Esperance Jetty (see Figure 4).

The Department of Environment and Conservation is concerned with the protection of marine waters with the objective of ensuring that the environmental values of marine waters, sediments and biota are preserved, enhanced and protected. Environmentally significant development proposals in Western Australia are assessed by the Environmental Protection Authority under the *Environmental Protection Act 1986*. A development proponent is currently required to refer its proposal to the Environmental Protection Authority if it is likely to have a significant impact on environmental values. Current requirements will not be altered by this strategic framework or by any subsequent creation of marine protected areas.

The Department of Water, which has responsibility for the management of Western Australia's fresh water resources, is active in community planning for the many south coast estuaries. Under the *Port Authorities Act 1999*, Port Authorities are required to "protect the environment of the port and minimise the impact of port activities on that environment".

Marine Protected Areas

A framework for marine parks and reserves is outlined in the 1998 document entitled New Horizons – the way ahead in marine conservation and management.

The Australian and New Zealand Environment and Conservation Council released a Strategic Plan of Action for the National Representative System of Marine Protected Areas in 1999. This document provides guidance for Australia in fulfilling its international responsibilities and obligations as a signatory to the Convention on Biological Diversity and other international agreements. The document defines a "protected area" as:

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

Marine parks and reserves as well as Fish Habitat Protection Areas satisfy the criteria for Marine Protected Areas.

A report by the Western Australian Government's Marine Parks and Reserves Selection Working Group released in 1994 identified "candidate areas" which in the view of the Committee warranted consideration for marine reservation for the purposes of conservation and recreation. The Working Group identified 14 potential marine reserve areas on the south coast (see Figure 5).

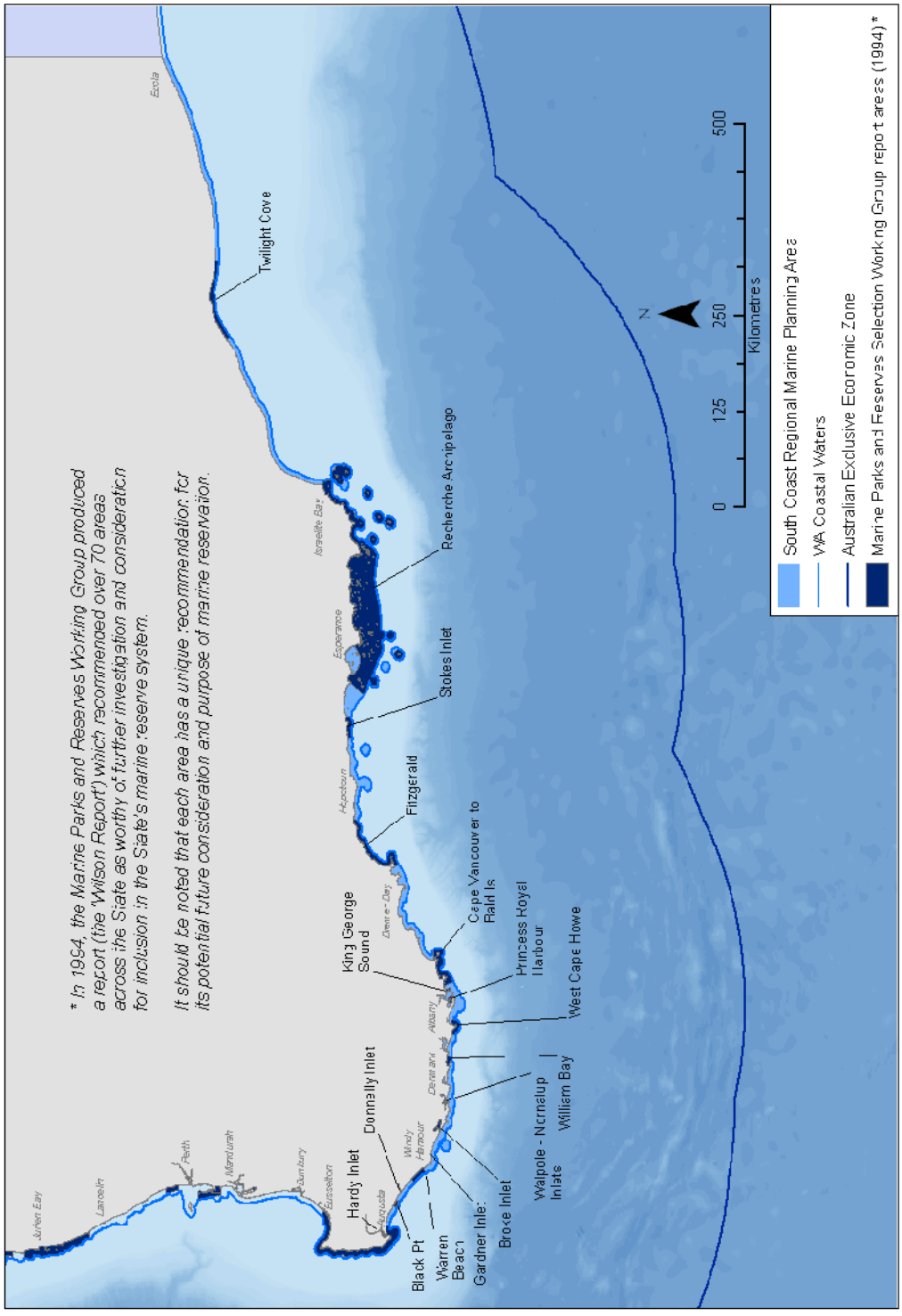


Figure 5: Marine Parks and Reserves Selection Working Group 1994 (the 'Wilson Report') areas

For map source information see Appendix 4

Currently (2010), there is one marine park on the south coast, the Walpole and Nornalup Inlets Marine Park.

Other aspects of marine conservation are covered in the sections on *Estuaries* and *Introduced Marine Organisms.*

Challenges and Opportunities

- Increasing population with associated pressures on coastal and marine environments.
- Pollution of marine ecosystems including from fertilisers, sewage, aquaculture wastes, heavy metals, oil spills, increased turbidity and marine noise.
- Increasing environmental pressure from recreational activities.
- Increased recreational and commercial boating and shipping movements.
- Changes to the physical structure of seabeds due to commercial developments.
- Increasing human impact on deeper waters due to developing technology for uses such as resource exploration, fishing and power generation.
- Developments in estuaries and catchments, with resultant pollution, eutrophication and artificial opening of estuaries.
- Progressive loss and damage of key habitats (e.g. seagrass).
- Risk that habitats of important and valuable species could be damaged before they are fully understood or discovered.
- Increased extraction of marine resources, both recreational and commercial.
- Disturbance of marine fauna (with endemic species especially vulnerable due to their limited ranges).
- Introduced marine organisms (see *Introduced Marine Organisms*).
- Paucity of knowledge.
- Insufficient funding for marine research, particularly ecosystem and biodiversity survey work.
- Insufficient education about marine issues throughout the south coast community.
- Limited involvement of south coast communities in marine planning and management.
- Limited communication and co-ordination between marine managers and users.
- Insufficient staff for compliance monitoring.
- Difficulty of predicting climate change impacts.
- Responsibilities for marine conservation are split across several agencies.
- Strong public support for the protection of marine conservation values.

Marine Protected Areas

- Concern from some sectors of the community about the potential impacts of marine protected areas on social and economic values.
- Concern from some sectors of the community about the justification for marine protected areas.
- Integration of protected areas with existing marine uses.
- Lack of community understanding of the varying levels of human use which can be undertaken in marine protected areas.
- Resourcing the management of marine protected areas.
- Integration of the Western Australian system of marine parks and reserves with those in Commonwealth waters and with the terrestrial reserve system.

Objectives

- To achieve co-ordinated and co-operative marine conservation planning and management.
- To improve awareness and understanding of marine conservation issues among all marine stakeholders and members of the public.
- To obtain support for marine conservation planning and management from marine stakeholders and members of the public.
- To reduce impacts of land-based activities on the marine environment.

Marine Protected Areas

- To integrate a system of marine protected areas into the complex array of other marine uses.
- To improve the understanding of marine stakeholders and members of the public of the role of and need for marine protected areas.
- To ensure that marine stakeholders and members of the public are aware of opportunities for engagement in the planning and management of marine protected areas.
- To use adaptive management approaches in marine protected areas.

No. C1.1	Proposed General Strategies for Marine Conservation	Responsibility for Initiation	Timing of Initiation
	Sustainability		
S1	Identify priority areas for marine conservation through the proposed marine value and usage mapping process (see *Cooperation and Integration*).	ICG, MPRA	Years 1-2
S2	Establish clear marine conservation objectives and targets.	DEC, DoF, WAM, MPRA	Years 1-2
S3	Determine the mix of conservation approaches (marine parks and reserves, Fish Habitat Protection Areas and other conservation measures) required to ensure marine conservation outcomes (see also strategies for marine protected areas below).	DEC, DoF, MPRA	Years 1-2
S4	Seek to maximise positive and minimise negative social and economic impacts associated with developing and implementing marine conservation strategies.	ICG, MPRA	Years 1-2
S5	Engage marine stakeholders and members of the public in all aspects of marine conservation planning and management.	ICG	Underway (WAG, NRMG, Ind)
S6	Utilise local knowledge in marine conservation planning and management.	ICG	Underway (WAG)
S7	Monitor the success of marine conservation programs and provide feedback to marine stakeholders and members of the public.	DEC, DoF, MPRA	Years 3-5
S8	Monitor marine environments to ensure that marine conservation objectives and targets are being met.	DEC, DoF	Years 3-5
S9	Encourage monitoring of human-generated marine noise and seek to minimise the potential for harmful effects on marine life.	ICG	Years 6-10
S10	Continue to encourage land managers to consider and manage the impacts of their activities on the marine environment.	ICG, NRMG, LGA	Underway (WAG, NRMG, Ind)
S11	Continue to promote understanding of and compliance with the requirements for interaction with marine species.	DEC, DoF	Underway (WAG)
S12	Provide diverse and ongoing education programs to highlight user impacts on the marine environment and to improve understanding of marine conservation issues among planners, managers, marine stakeholders and members of the public.	ICG, NRMG	Underway (WAG, TI, NRMG)
S13	Encourage further baseline research into south coast marine environments to provide a basis for marine conservation planning and management.	ICG, NRMG	Underway (WAG, TI, NRMG)
S14	Conduct further research to better define management approaches.	DEC, DoF	Underway (WAG, TI, NRMG)
S15	Seek adequate resources for effective management and monitoring of marine conservation values.	ICG, NRMG	Years 1-2

S16	Promote the use of environmental management systems by key marine sectors to effectively manage their activities and potential risks to the marine environment.	ICG, NRMG	Years 3-5
S17	Ensure provision of essential infrastructure required to manage risks (e.g. waste disposal systems for boats).	DoT, DoP	Years 3-5
S18	Seek to have the *Implementation Framework for Western Australia for the Australian and New Zealand Guidelines for Fresh and Marine Water Quality Monitoring and Reporting* applied to the waters of the south coast.	DEC	Years 3-5
	Inter-sectoral coordination		
C1	Clearly define and publicise agency responsibilities and coordination mechanisms for marine conservation.	ICG	Years 1-2
C2	Integrate planning and management for marine conservation across all relevant agencies.	ICG	Years 1-2

Marine Protected Areas

No. C1.1	Proposed Strategies for Marine Protected Areas	Responsibility for Initiation	Timing of Initiation
	Sustainability		
MP S1	Provide clear explanations to marine stakeholders and members of the public of the objectives and management regimes of marine protected areas and the terminology used.	DEC, DoF, MPRA	Years 1-2
MP S2	Encourage further research to gather adequate bio-physical and socio-economic information to enable planning for the location of a marine protected area system.	DEC, DoF, MPRA	Underway (WAG, TI, NRMG)
MP S3	Monitor the success of marine protected areas in achieving stated objectives and use adaptive management to improve performance.	DEC, DoF, MPRA	Years 3-5
MP S4	Adapt management of marine protected areas in response to changing circumstances.	DEC, DoF, MPRA	Years 3-5
MP S5	Consider potential climate change impacts when planning marine protected areas.	DEC, DoF, OCC, MPRA	Years 1-2
	Inter-sectoral coordination		
MP C1	Plan with marine stakeholders and members of the public before implementing a marine protected area system for the south coast.	DEC, DoF, MPRA	Years 1-2
MP C2	Propose a review of the recommendations of the 1994 Report of the Marine Parks and Reserves Selection Working Group as part of the identification of candidate areas for marine parks and reserves for use in the proposed marine value and usage mapping process (see *Cooperation and Integration*).	DEC, MPRA, DoF, DMP	Years 1-2
MP C3	Plan the location of marine protected areas on the basis of adequate scientific information as well as stakeholder, industry and public input, accommodating existing use patterns in the best manner possible.	DEC, DoF, WAM, MPRA	Years 1-2
MP C4	Ensure potential positive and negative impacts on existing and future social, cultural and economic values are considered in the planning and management of marine protected areas.	ICG, MPRA	Years 1-2
MP C5	Plan the location of marine protected areas to take account of terrestrial land use (including conservation reserve disposition) on the coast.	DEC, DoF, MPRA	Years 1-2

MP C6	Where practicable, plan the State marine protected area system to ensure representation of all habitats and species across the continental shelf through linking with reserves in Commonwealth waters.	DEC, DoF, MPRA	Years 1-2
MP C7	Include marine stakeholders and members of the public in the management of marine protected areas and other conservation approaches in State waters of the south coast.	DEC, DoF, MPRA	Years 3-5

C1.2 Estuaries

Context

A sea level rise at the end of the last ice age flooded the mouths of rivers draining to Western Australia's south coast and in the process formed a series of estuaries for which this coast is renowned. In all, the south coast has over 30 estuaries (see Figure 2). Estuaries have always been important to the Aboriginal inhabitants of the south coast, as they provide a wealth of food and other resources. In the early days of European settlement, estuaries provided the only safe anchorages on this wild coast and gave ease of access to rivers for transport and thus many of them became the locations for early European settlements on the south coast. Over time, these population centres and the associated environmental pressures have seen significant growth. South coast estuaries are fundamentally important to the lifestyles of many south coast residents and visitors alike.

The estuaries of the south coast are wave-dominated, rather than tide-dominated estuary systems. The dominant feature is the presence of a sandbar across the mouth, with the Hardy Inlet, Oyster Harbour, Waychinicup and Nornalup estuaries the only permanently open systems. Seasonal and annual variations in rainfall mean that estuaries are always changing. With their mix of salt and fresh waters, they have each developed their own unique environments. They are important nursery areas for numerous fish species and provide essential habitats for species such as waders. As the receiving points for the waters draining from inland catchments, estuaries are vulnerable to deterioration in water quality leading to degradation of their biota and habitats. Considered on a geological time scale, these estuaries are temporary features, having a life span of only a few thousand years before infilling and becoming wetlands.

South coast estuaries incorporate high environmental values through provision of habitats and nursery areas for numerous species of fish and other marine species. The estuaries of the south coast also have very high economic values. South coast estuaries play a vital role in the economy of the region as focal points for tourism and coastal development as well as supporting commercial fisheries.

Management plans are being progressively prepared for the major south coast estuaries with plans underway or completed to date (2010) for the Torbay, Wellstead, Culham, Stokes and Walpole-Nornalup estuaries, Albany Harbours and the Wilson Inlet. These processes are being coordinated by either the Department of Water or the Department of Environment and Conservation.

Other aspects relevant to estuaries are covered in the section on *Catchment Management.*

Challenges and Opportunities

- Lack of integrated management.
- All estuaries would benefit from clear goals and management plans.
- Limited community involvement in many areas.
- Altered hydrology due to catchment clearing and drainage.
- Altered water quality due to urban and rural land uses including increased nutrients and other pollutants.
- Increased rates of erosion, sedimentation of river pools and estuary basins.
- Development of and vehicle access to estuary floodplains leading to requirement for sand bar openings and lower estuary levels.
- Nutrient "hot spots" developed on estuary floodplains.
- Estuarine fish management and allocation.
- Increased recreational pressure on foreshore areas and estuaries.
- Inadequacy of foreshore reserves.
- Appropriate management for reserves and public access.

- Limited resources available for foreshore reserve acquisition and management (see also *Coastal Development*).
- Limited knowledge of estuary values especially ecological and cultural values.
- Resourcing of and responsibility for foreshore management.
- Potential climate change impacts on estuaries (see *Climate Change*).
- Recognition and protection of Aboriginal sites around estuaries (see *Aboriginal Heritage*).

Objective

- To ensure estuaries are managed in a manner that best protects and enhances their environmental, economic and social values.

No. C1.2	Proposed Strategies for Estuaries	Responsibility for Initiation	Timing of Initiation
	Sustainability		
S1	Extend research and monitoring to better understand estuarine values.	DoW, DEC	Underway (WAG, TI, NRMG)
S2	Provide resources for improved management of estuaries and for acquisition and management of foreshore reserves.	DoW, DEC	Years 1-2
S3	Incorporate representative estuarine environments in the marine protected area system.	DEC, DoF, DoW, MPRA	Underway (WAG)
S4	Complete mapping of estuary floodplains and provide development guidelines.	DoW, DoP	Underway (WAG, NRMG)
S5	Encourage research into the potential impacts of climate change on estuarine values.	DoW, OCC, NRMG	Years 3-5
S6	Develop a framework for estuarine sand bar management on the south coast.	DoW	Years 3-5
S7	Increase interpretation and education programs on estuarine values and threats.	DoW, NRMG	Underway (WAG, NRMG)
	Inter-sectoral coordination		
C1	Foster an integrated approach to estuary management on the south coast.	ICG	Years 1-2
C2	Continue to prepare and implement plans which protect and enhance estuarine values.	DoW	Underway (WAG)
C3	Provide regional governance of estuaries.	DoW	Years 3-5
C4	Agree on a lead agency for managing each estuary and clarify roles to members of the public.	DoW	Years 3-5

C1.3 Introduced Marine Organisms

Context

Introduced (non-indigenous, exotic or foreign) marine organisms are aquatic organisms that have been introduced into an area where they do not naturally occur. Introduced marine organisms can have significant long-term environmental, economic, social and cultural impacts. They can affect biodiversity and ecosystem integrity through displacing native species by competing for or destroying their habitat, competing for food resources and disturbing the balance of the food chain. They can also carry diseases harmful to native organisms and which can impact on the health of humans (e.g. toxic dinoflagellates). If established, introduced marine organisms can have long lasting impacts and can be difficult to eradicate. The introduction of non-indigenous marine species and diseases to new environments has been identified as one of the greatest risks to coastal environments. In addition, organisms can naturally expand their range or relocate to a new area.

It is estimated that there are over 250 non-indigenous marine and estuarine organisms in Australian waters (though not all are "pests"). Non-indigenous marine pests and diseases may be introduced into Western Australia or translocated between different parts of Western Australia by a wide range of vectors and actions, including:

- fouling of vessels and equipment (e.g. fishing or aquaculture gear such as cages, nets, lines, floats and anchors);
- ballast water;
- deliberate release or escape from ponds, tanks or cages of live fish (e.g. aquarium fish, live fish for the restaurant trade and aquaculture stock); and
- dead fish and fish products (e.g. bait used by recreational and commercial fishers).

International ships are required to exchange ballast water in deep waters where any contained organisms are less likely to survive. Ballast water exchange must be conducted outside the 12 nautical mile limit of Australia's territorial waters and it is also recommended that ballast exchanges are conducted as far as possible from shore and in water at least 200 metres deep. Compliance is monitored by the Australian Quarantine and Inspection Service. New Commonwealth legislation will require vessels moving within Australian waters to discharge ballast water, if safe to do so, beyond the 12 nautical mile limit of Australia's territorial waters and preferably beyond Australia's 200 nautical mile Exclusive Economic Zone if achievable.

Organisms can also be introduced through hull fouling, when they arrive at a new location attached to the exterior of vessels. Hull fouling of commercial vessels is monitored and managed by the Australian Quarantine and Inspection Service. A publication titled *Biofouling: Best Practice Guidelines* provides advice for the management of hull fouling and guidelines have been developed for the management of hull fouling risk from recreational vessels. National Control Plans are developed for responding to each species of concern.

The Department of Fisheries is the lead agency in Western Australia responsible for the management of introduced marine organisms. Identification of introduced marine organisms is predominantly carried out by specialist staff of the Western Australian Museum. A new Western Australian *Biosecurity and Agriculture Management Act* was passed by Parliament in September 2007. The biosecurity provisions of the Act are aimed at preventing plant and animal pests and diseases from entering Western Australia (border security) and at minimising the spread and impact of those already found in Western Australia (biosecurity within Western Australia). The new Act will be Western Australia's primary biosecurity legislation and the primary regulatory framework to manage plant and animal pests and diseases that may affect the environment, industry and the economy or public safety and amenity. The Act will operate in conjunction with the existing biosecurity provisions of a number of other existing Acts, including the *Fish Resources Management Act 1994* and will become fully operational in 2010.

In the mid to late 1990s, all major Australian ports except Dampier were surveyed using methodology developed by the CSIRO Centre for Research into Introduced Marine Pests. Surveys of marine areas were undertaken to determine what species occurred naturally in an area so that introduced species could then be identified. Both Esperance and Albany were surveyed with methods used by the Centre for Research into Introduced Marine Pests.

A Statewide examination of introduced marine organisms was funded under the Natural Heritage Trust. One component of the project was an examination of the literature, unpublished reports and specialist knowledge to determine which species have been introduced into Western Australia. Approximately 100 species were considered, 60 of which have been verified as introduced and living in Western Australia. These species are concentrated in the south west, with 46 being recorded from the Fremantle marine area and further south. Fifteen species have been introduced into Esperance and 25 into the Albany area. Most species identified to date cause no apparent detrimental effects and only a small number are recognised as pest species. Future monitoring under the proposed National Monitoring Strategy, which focuses on ongoing standardised monitoring to detect high risk species at priority locations around Australia, will target 55 species of concern that either have been or have the potential to be introduced into Australia.

Also as part of the Natural Heritage Trust project, the marine waters around Albany have been resurveyed, with logistical assistance from the Albany Port Authority. Test panels were installed within

Albany Harbour in August 2007 and retrieved in early 2008 to determine what had settled on them and the results have been analysed. A similar set of test panels was installed in Esperance with financial assistance from South Coast Natural Resource Management Inc. Using the results of these surveys, a risk assessment has been conducted for introduced marine organisms in the marine waters of Albany and Esperance. Options for future monitoring and detailed studies include:

- A community based monitoring program for specific species that could be introduced and for which preliminary identifications can be made by experienced divers;
- A sampling program using settlement plates that are regularly installed and recovered;
- An examination of the shipworms present in Albany and Esperance to determine if any are introduced; and
- A study of the abundance and distribution of the European oyster *Ostrea edulis* and the native *O. angasi*.

Exotic diseases have also been introduced into south coast marine waters. In the 1990s, a lethal herpes virus infected pilchard populations along Australia's southern coast causing a collapse in populations and severely impacting the commercial fishery based on the species. Currently (2010) the Abalone Ganglioneuritis Virus is affecting abalone populations in Australia's south eastern states. The virus was first detected on two land-based abalone aquaculture farms and two offshore experimental farms in Victoria and is now found in populations of wild abalone. The disease has not been identified in Western Australia at this time and, in conjunction with Albany and Esperance Ports, voluntary ballast water management arrangements and other measures have been implemented to reduce the likelihood of accidental introduction.

Challenges and Opportunities

- Identification of exotic marine organisms and management of the risk of their introduction to the waters of the south coast.
- Insufficient numbers of qualified staff for the identification of introduced marine organisms.
- Difficulty of managing introduced marine organisms once they become established in an area.
- Monitoring and managing the impacts of populations of existing introduced marine organisms.
- Lack of knowledge of impacts of introduced organisms on marine ecosystems.
- Lack of coastal infrastructure to enable hull inspections.
- Allocation of adequate resources for hull inspections and ballast water exchange compliance monitoring.

Objectives

- To identify exotic marine organisms and manage the risk of their introduction to the waters of the south coast.
- To improve understanding of the impacts of introduced marine organisms on the south coast.

No. C1.3	Proposed Strategies for Introduced Marine Organisms	Responsibility for Initiation	Timing of Initiation
	Sustainability		
S1	Implement the provisions of the *Biosecurity and Agriculture Management Act* when operational.	DoF	Years 1-2
S2	Continue to support the activities of the Australian Quarantine and Inspection Service and the Department of Fisheries in managing the risks of the introduction of new marine organisms.	DoF	Underway (WAG, AG, NRMG)
S3	Encourage further research to identify marine ecosystems at high risk from introduced marine organisms and continue to take measures to manage risks in these areas.	DoF, DEC, WAM	Underway (WAG, TI, NRMG)
S4	Encourage additional monitoring of and research into the impacts of introduced marine organisms on marine ecosystems in south coast waters.	DoF, DEC, WAM	Underway (WAG, TI, NRMG)
S5	Extend education programs to raise awareness among small boat owners and the general public on how to reduce the likelihood of introducing marine organisms.	DoF	Underway (WAG)

S6	Seek adequate resources to identify and manage introduced marine organisms.	DoF, WAM	Years 1-2
	Inter-sectoral coordination		
C1	Continue to consider potential risks and impacts associated with introductions of exotic marine organisms when coastal and marine development proposals are assessed.	ICG	Underway (WAG)

C1.4 Marine Water Quality

Context
Marine pollution is managed under a range of State, national and international arrangements listed below.

- *The International Convention for the Prevention of Pollution from Ships* (known as the "MARPOL Convention") including the following annexes:
  - Annex I (Oil);
  - Annex II (Noxious Liquid Substances);
  - Annex III (Harmful Substances in Packaged Forms);
  - Annex IV (Sewage);
  - Annex V (Garbage); and
  - Annex VI (Air Pollution).
- *The National Plan to combat pollution of the sea by oil and other noxious and hazardous substances* under the leadership of the Australian Maritime Safety Authority.
- *The Environmental Protection (Sea Dumping) Act 1981,* administered by the Australian Government to regulate the dumping of wastes and other matter (e.g. dredge spoil) at sea.
- *The State Water Quality Management Strategy,* a policy that sets out a framework for the planning and management of the quality of the State's waters, including Western Australian coastal waters.
- The *Environmental Protection Act 1986,* administered by the Department of Environment and Conservation and the Environmental Protection Authority including for the protection of the marine environment from the effects of waste discharges and other polluting offences.
- The State marine pollution plan known as *WestPlan – Marine Oil Pollution* under which the Department of Transport implements the National Plan as the Hazard Management Agency for oil spills in Western Australia.

Most elements of the marine environment of the south coast are believed to be relatively unaffected by marine pollution. The most obvious water quality issues on the south coast relate to estuaries (see *Estuaries*) and ports (see *Ports and Shipping*). Both urban and rural catchments can influence both groundwater and estuarine water quality and therefore the quality of nearshore coastal waters. Impacts may build up over many years and are not always recognised until after environmental values have been degraded (as in the case of excessive nutrients and algal growth in Princess Royal Harbour, which contributed to the loss of important seagrass beds from the 1960s to the 1980s).

Under natural conditions, the estuaries of the south coast are low in nutrients, due to the age of the landscape and the presence of heavily leached soils. European settlement and the use of fertilisers have increased nutrient levels and plant and algal growth in these estuaries, adversely affecting almost all of them. In the past, landfill, effluent disposal, industrial discharges, agricultural chemicals and stormwater from unsewered residential areas have all caused contamination of estuaries and formerly fresh inflows have become more saline. New stormwater drainage systems are expected to contain measures to minimise impacts, through use of retention devices and pollution traps. Industrial discharges and effluent are no longer permitted to directly enter estuaries and an infill sewerage program aims to reduce the impacts of on-site effluent disposal in some areas. Treatment of wastewater before disposal through ocean outfalls reduces potential impacts on marine environments. Estuary management plans are being progressively prepared and contain objectives of improving catchment discharge water quality.

Natural resource management bodies have prepared regional strategies which are being implemented in the South West, South Coast and Rangelands Regions and cover catchment management in the south coast hinterland. These strategies are being progressively reviewed in the light of experience with their implementation. Integrated, whole-of-catchment planning and implementation aims to

promote land use change to protect high priority assets such as estuaries (see *Catchment Management*). Specific catchment management programs are coordinated through other planning processes and documents.

In accordance with the *State Water Quality Management Strategy,* the Environmental Protection Authority is systematically applying the frameworks of the *National Water Quality Management Strategy* over Western Australia's marine waters. This process identifies the environmental values, establishes spatially applied environmental quality objectives to be achieved and sets target water quality levels for the management of coastal waters.

Other potential sources of marine pollution also exist on the south coast. Waste water from aquaculture projects can contain contaminants, pathogens (see *Introduced Marine Organisms*) and/ or high levels of nutrients if not managed appropriately (see *Marine Aquaculture*). Domestic and foreign vessels frequent south coast waters and can also be a source of marine pollution. Spillage during ship loading activities can contaminate port sediments and waters, particularly by metals. Anti-fouling paints are used to reduce drag caused by growth of marine species and to lower the risk of transporting introduced marine organisms, but can themselves contain toxins harmful to marine life. The *Australian and New Zealand Environment and Conservation Council Strategy to Protect the Marine Environment – Code of Practice for Antifouling and in-water Hull Cleaning and Maintenance* provides guidance on matters such as slipway management and the use of tributyltin. Measured levels of anti-fouling contaminants in both Albany and Esperance Port waters are low.

Port-related development activities such as dredging and dredge spoil disposal have the potential to affect the marine environment and therefore require careful management.

Oil spills pose a risk to marine and coastal environments as highlighted by the sinking of the *Sanko Harvest* off Esperance in 1991. Oil spill contingency plans are in place for Albany and Esperance Ports and there is a Memorandum of Agreement between the Department of Transport and the south coast ports for first response to oil spills outside port boundaries. Limited waste reception and disposal facilities exist at Albany and Esperance ports.

Some vessels illegally dispose of rubbish at sea and coastal users also leave litter, though south coast beaches experience low levels of marine debris compared to more heavily populated coasts. However, the 2007 Western Australian State of the Environment Report identified marine debris as a growing issue, with for example, nearly 500 kilograms of marine debris (11,395 items) collected from south-west beaches between Yallingup and Augusta over a ten-month period in 2005. Only limited surveys have been completed in Western Australia and there is a general lack of quantitative data about marine debris. The clean up of marine debris, particularly outside urban areas, is mostly undertaken by community members and Coastcare volunteers. The Western Australian Fishing Industry Council has developed a code of practice for rubbish disposal at sea by commercial fishers operating in Western Australian waters.

Challenges and Opportunities

- Management of catchments draining to the south coast can have a large influence on marine water quality, particularly in estuaries (see *Catchment Management*).
- Expanding population and related coastal developments can lead to an increase in outflows of stormwater, sewerage and other pollutants and can alter groundwater hydrology, thereby affecting coastal waters.
- Oil spills are a potential risk to coastal and marine values and require the coordination of significant resources if they occur.
- Marine debris poses significant risks to animals, including whales and other marine species.
- The use of some anti-fouling paints can contaminate marine environments where high levels of boating and shipping occur.
- Limited water quality monitoring is taking place at present.
- Limited information exists on the quality of water discharged to the sea.
- It can be costly to monitor water quality and pollution events can often be very short in duration and difficult to detect.
- On-ground works to improve water quality are often extremely costly.
- The south coast marine environment is believed to be relatively free of marine pollution at present, though studies have been limited.

- An existing network of catchment groups, supported within a natural resource management framework, is tackling landcare in the region in a targeted fashion (see *Catchment Management*).

Objectives

- To maintain the quality of south coast marine environments.
- To reduce adverse impacts of urban and rural catchments on estuarine and coastal water quality.
- To minimise adverse impacts from marine pollution events.
- To better understand the impacts of water quality decline on the marine environment.

No. C1.4	Proposed Strategies for Marine Water Quality	Responsibility for Initiation	Timing of Initiation
	Sustainability		
S1	Conduct comprehensive risk assessments to identify priorities for planning and management of marine pollution.	ICG	Underway (WAG, Ind)
S2	Monitor marine and estuarine water and sediment quality at selected sites along the south coast to ascertain pollutant levels.	DEC, DoW	Years 3-5
S3	Encourage monitoring and research to identify catchment impacts on the nearshore environment.	DEC, DoW, NRMG	Years 3-5
S4	Determine appropriate water quality targets for catchment discharge to protect the values of coastal waters.	DoW	Years 1-2
S5	Continue to prepare and implement catchment management plans, particularly for priority estuaries or priority coastal waters.	ICG, DoW	Underway (WAG, NRMG)
S6	Encourage further sewerage infill programs for developments close to estuaries or coastal areas.	ICG, Water Corporation, LGA	Underway (WAG)
S7	Ensure new developments, industries or drainage do not lead to water quality decline through discharge to estuaries or coastal waters.	DEC, DoW, LGA, Water Corporation	Years 1-2
S8	Encourage treatment of any wastewaters discharged into estuaries or coastal waters.	ICG, Water Corporation, LGA	Underway (WAG)
S9	Continue to promote and enforce maritime statutes, regulations and codes of practice with respect to marine water quality.	DEC, DoF, DoW	Underway (WAG)
S10	Seek adequate resources and training for combating major pollution events on the south coast.	DoT	Years 3-5
S11	Expand education programs for marine users and catchment managers on the regulation of and impacts from pollutants and marine debris on marine environments.	ICG, NRMG	Underway (WAG, NRMG)
	Inter-sectoral coordination		
C1	Enhance two-way communication between terrestrial and marine sectors likely to impact on the water quality of the south coast marine environment.	ICG, NRMG	Underway (WAG, NRMG)
C2	Continue to work with natural resource management groups and key Government agencies to influence catchment plans and management approaches to reduce pollutants in outflows.	ICG, NRMG	Underway (WAG, NRMG)
C3	Continue to develop, update and implement oil spill contingency plans.	DoT, Port Authorities	Underway (WAG)
C4	Continue to involve multiple agencies, non-Government organisations and community teams in coastal and marine clean up programs.	ICG	Underway (WAG)

C1.5 Climate Change

The Western Australian Marine Science Institution and the Indian Ocean Climate Initiative, along with many other scientific organisations, are conducting research into climate processes (see *Research*).

Challenges and Opportunities

- Uncertain but potentially large sea level rise and increased storm surge.
- Implications of changes in sea temperatures for ocean currents (particularly the Leeuwin Current).
- Impacts of further decreased rainfall along the south coast, including implications for the water quality of estuaries and for nearshore environments.
- Changes in sea temperatures and potential impacts on marine flora, fauna and fisheries.
- Increased incidence of extreme weather events and implications for infrastructure damage, insurance costs and long term availability of insurance.
- Ocean acidification resulting from elevated CO_2 levels and the impact of increased CO_2 concentrations on biophysical processes.
- Determining and implementing appropriate setbacks for infrastructure; allocation and maintenance of adequate buffer zones for coastal protection; and policies to manage infrastructure and public and private properties in areas likely to be severely affected by climate change.
- Potential impacts of carbon storage and other low-emissions energy technologies in coastal and under-sea environments.
- Potential for the south coast to become a leader in the response to climate change.
- Good planning and strategic investment in adaptation responses to the risks and potential impacts of climate change in marine and coastal areas can result in significant risk and cost reductions including to human health, property, quality of life and economic productivity and opportunities.

Objectives

- To adapt to the impacts of climate change on coastal and marine environments and human activities.
- To increase awareness of potential climate change impacts on coastal and marine systems.
- To contribute to the abatement of climate change impacts through improved energy efficiency and encouragement of low-emission energy sources.

No. C1.5	Proposed Strategies for Climate Change*	Responsibility for Initiation	Timing of Initiation
	Sustainability		
S1	Encourage regional research into potential climate change implications for the south coast including the development of regional-scale digital elevation models and specific scenarios for the south coast region.	ICG, OCC, WAMSI	Years 1-2
S2	Ensure new coastal and marine infrastructure is designed to cope with climate change impacts.	DoP, OCC, LGA	Years 1-2
S3	Facilitate Local Government efforts to mitigate the coastal impacts of climate change.	DoP, LGA, OCC	Years 3-5
S4	Encourage provision of training for key Government and private sector decision makers in planning and management for climate change impacts.	ICG, OCC	Years 3-5
S5	Provide public education programs in the mitigation and implications of climate change impacts.	ICG, OCC, NRMG	Years 6-10
S6	Monitor changes in the south coast marine environment as a result of climate change and incorporate findings in State, National and International databases.	DEC, DoF, OCC	Years 3-5
S7	Facilitate the further development of sustainable renewable energy options on the south coast, particularly through harnessing wave, tidal and wind power.	DoP, Office of Energy	Underway (WAG, Ind)
S8	Consider potential marine impacts in assessing any proposals for carbon storage on the south coast.	ICG, EPA	Years 3-5

S9	Plan for climate change impacts on commercial fishing and other maritime industries.	ICG, OCC	Underway (WAG, Ind)
S10	Use adaptive management approaches to adjust marine planning and management in response to climate change impacts.	ICG, OCC	Years 6-10
S11	Develop flexible management strategies for south coast estuaries to deal with more variable river flow (lower flows, extreme events, flooding) and incorporate into Local Government floodplain management strategies.	DoW	Years 3-5
S12	Consider climate change implications in the design, planning and management of any future marine protected area system for the south coast.	DEC, DoF, OCC, MPRA	Years 1-2
	Inter-sectoral coordination		
C1	Identify priority areas at risk from climate change impacts through the proposed marine value and usage mapping process (see *Cooperation and Integration*).	ICG, OCC	Underway (WAG, TI)
C2	Coordinate Government and private sector responses to the marine impacts of climate change on the south coast though a cross-sectoral Implementation Coordinating Group (see *Cooperation and Integration*).	ICG, OCC	Years 3-5

* See also climate change strategies in individual sections of this strategic framework.

C2. HUMAN USE

C2.1 Fishing (General)

Context

Commercial, recreational and Aboriginal fishing are all fundamental elements of life on the south coast. Each type of fishing is covered in detail in the following sections, however, an overview of the activity is required to properly integrate the planning and management of the various components of fishing activity. The Department of Fisheries is responsible for the management of fishing throughout the State.

Fisheries management needs to manage the level of exploitation of fish stocks as well as providing a basis for future changes in the way fish and aquatic resources are used and shared across the community. To achieve this, the Department of Fisheries has adopted an Integrated Fisheries Management approach. Integrated Fisheries Management involves:

- setting the total sustainable harvest level for each resource that allows for an ecologically sustainable level of fishing;
- allocation of explicit catch shares for use by commercial, recreational and Aboriginal fishers;
- continual monitoring of each sector's harvested catch;
- managing each sector within its allocated catch share; and
- developing mechanisms to enable the reallocation of catch shares between sectors as the community's use of fish resources changes over time.

Integrated Fisheries Management is a Statewide initiative and is being progressively implemented throughout the State.

The Department of Fisheries has also adopted an Ecosystem-Based Fisheries Management approach to deal with the ecological, social and environmental implications of fishing activity. As the name suggests, this is an ecosystem-based management approach, rather than operating fishery by fishery, which recognises the inter-relationship between fishing activity and the broader environment. Ecosystem-Based Fisheries Management embraces the concept of Ecosystem-Based Management (see *Context for South Coast Regional Marine Planning*), as well as Ecologically Sustainable Development principles and the resource sharing principles of Integrated Fisheries Management, at a bio-regional scale. Ecosystem-Based Fisheries Management involves the assessment of ecological

and socio-economic issues using a transparent ”risk based” approach and allows for effective and strategic input into natural resource management initiatives along the south coast, within both marine and freshwater environments. The adoption of an Ecosystem-Based Fisheries Management approach to fisheries management, which can be readily adapted for use through Regional Marine Planning, is likely to result in improved conservation outcomes and aligns with increasing community expectations for a holistic approach to management of the marine environment.

The Department of Transport provides a network of boat ramps, boat harbours and maritime facilities along the south coast (see *Coastal Development*). These facilities support recreational, commercial and Aboriginal fishing by providing safe access to the Southern Ocean. Boat harbours are usually managed by the Department of Transport with boat ramps administered by Local Authorities. Figure 19 shows the location of maritime facilities along the south coast.

Challenges and Opportunities

- Maintaining sustainable wild stock fisheries.
- Sustainable and equitable allocation of fish stocks among commercial, recreational and Aboriginal fisheries.
- Management of any conflict between fishing sectors to facilitate the maintenance of sustainable fisheries.
- Maintenance of water quality and fish habitat to protect commercial and recreational fisheries.
- Identification of cross-shelf pathways for migratory species to protect commercial and recreational fish species.
- Potential impacts on the marine environment and fish populations as a result of climate change.

Objectives

- To sustainably manage wild stock fisheries.
- To integrate planning and management of all fisheries on the south coast on an ecosystem-wide basis.
- To share resources equitably between commercial, recreational and Aboriginal fisheries.
- To improve understanding by marine stakeholders and members of the public of the benefits of sustainable fishing.

No. C2.1	Proposed Strategies for Fishing (General)	Responsibility for Initiation	Timing of Initiation
	Sustainability		
S1	Manage fisheries in accordance with the principles of Ecologically Sustainable Development.	DoF	Underway (WAG, AG)
S2	Expand educational programs to promote sustainable fishing.	DoF	Underway (WAG, AG, Ind)
S3	Develop and maintain a comprehensive data base detailing catch, effort and spatial information for commercial, recreational and Aboriginal fisheries on the south coast.	DoF	Years 1-2
S4	Integrate the concept of ecosystem-based fisheries management within marine planning initiatives on the south coast.	DoF	Underway (WAG, AG)
S5	Consider potential climate change impacts when planning for and managing commercial, recreational and Aboriginal fishing activity.	DoF, OCC	Years 6-10
S6	Promote and expand research to support sustainable fisheries.	DoF	Underway (WAG, AG, TI, Ind)
S7	Improve spatially defined catch and effort data.	DoF	Years 3-5

	Inter-sectoral coordination		
C1	Prepare and implement a single ecosystem-based fisheries management plan for State and Commonwealth waters of the south coast.	DoF	Years 1-2
C2	Facilitate ongoing communication between recreational, commercial and Aboriginal fishers through a cross-sectoral Implementation Coordinating Group (see *Cooperation and Integration*).	DoF	Underway (WAG, AG, Ind)
C3	Integrate planning and management of fisheries with that occurring in catchments that flow to the south coast.	DoF	Years 3-5

C2.2 Recreational Fishing

Context

Western Australia's south coast is extremely popular with recreational fishers, both residents and tourists and accounts for 20% of the total recreational fishing effort in the State. Much of the south coast is remote or difficult to access and recreational beach and boat fishing tends to be concentrated around the main population centres and access points to beaches and rocky areas, during the summer months. Recreational fishing contributes significantly to the local economy through sales and maintenance of equipment including fishing gear, boats and vehicles; fuel expenses; and revenue from tourist accommodation and services.

There are four principle types of recreational fishing on the south coast:

- rock and beach fishing;
- boat-based fishing;
- dinghy and shoreline fishing of estuaries and rivers and recreational netting in estuaries; and
- shore and boat-based diving.

The majority of south coast estuaries and catchments are open to recreational fishing with the main focus areas being Hardy Inlet, Wilson Inlet, Walpole and Nornalup Inlets, Princess Royal Harbour and Oyster Harbour.

Recreational fishing surveys were undertaken for estuarine fishing along the south coast in 2000/01 and 2002/03 and indicate that recreational fishing is a significant component of the total catch in estuaries. Survey results confirm that peak usage occurs over holiday periods and over summer and Easter holidays in particular. Surveys of the recreational Western Australian salmon and Australian herring fisheries have also been conducted.

The 2000/01 estuarine survey indicates the most commonly caught species include black bream, King George whiting, blue swimmer crabs, pink snapper, skipjack trevally, prawns, Western Australian salmon, mullet, Australian herring, mulloway, tailor, squid and tarwhine.

A report on a 12-month creel survey of boat-based recreational fishing in the west coast bioregion was released in 2008 and has assisted in catch and effort estimates for the recreational sector at the western end of the south coast (east as far as Black Point).

Overall, very little historical recreational catch and effort data is available, making it difficult to assess the impact of the recreational fishing sector on marine fish stocks. In 2004 a voluntary Recreational Angler Logbook Program was introduced to collect catch information and biological samples from recreational anglers. This will provide information needed about local fish stocks and can be used with long standing commercial fishery data in the management of south coast fisheries. Current lack of data prevents the quantification of trends in fishing effort, although it is likely that effort is increasing in proportion to human population increases on the south coast. The Western Australian Government announced in October 2009 that State Natural Resource Management funding of $300,000 had been made available for quantifying recreational fishing catch and effort.

Results for recreational fishing from the Community Recreational Marine Usage Survey (see *South Coast Regional Marine Planning Process*) are shown in Figure 6 and indicate the popularity of recreational fishing on the south coast. Some of the survey results for recreational fishing are shown in Table 2 and indicate the value that respondents place on recreational fishing on the south coast. Respondents were asked to assign a value of 1 to 5 ("low" to "high") against various marine recreational pursuits in relation to their personal recreation and also relating to their perception of wider community values. Shore-based, inshore boat-based and offshore boat-based fishing ranked 4th, 7th and 9th respectively, out of 24 recreational activities for a "my value" response of 4 or 5 (i.e. "high" value).

Table 2: Responses on fishing to the recreational "values" question of the Community Recreational Marine Usage Survey.

Activity (262 responses in total)	**"My Value"**			**"Wider (community) Value"**		
	"Lower"		"Higher"	"Lower"		"Higher"
	0, 1 or 2	3	4 or 5	0, 1 or 2	3	4 or 5
Recreational fishing - Shore-based	37.0%	17.2%	45.8%	23.3%	15.6%	61.1%
Recreational fishing - Inshore boat-based (< 3 nautical miles offshore)	48.5%	14.9%	36.6%	29.0%	20.6%	50.4%
Recreational fishing - Offshore boat-based (> 3 nautical miles offshore)	61.5%	8.8%	29.8%	42.7%	24.0%	33.2%

The survey asked the following question:
"This question is about the value/ importance of different coastal/ marine activities to you, in your own marine usage and also how valuable/ important you think these activities are to the wider community. Please place a number from the scale below (1/ low – 5/ high) in every box."

Sixty nine per cent of the 262 respondents to the survey indicated that they engaged in recreational fishing in an average year and also provided detailed information about the areas and average number of days per year that they engaged in recreational fishing. This was the highest proportion of detailed responses for any single recreational use.

Recreational fishing is managed on a bio-regional basis, there being two bio-regions represented on the south coast (South Coast bio-region from Black Point to the South Australian border and part of the West Coast bio-region west of Black Point). Each region has rules which apply throughout the bio-region (unless in a specified marine park or reserve where site specific rules apply) for the take of all fish including finfish, crustaceans and shellfish. Individual recreational fishing licenses are required for the take of rock lobster, abalone, marron, freshwater angling and net fishing.

Limits on the quantity of finfish species help prevent excessive catches by individuals on a fishing trip and set a benchmark for "socially acceptable" catch limits. These are referred to as "daily bag limits" and cover the recreational take in a 24-hour period. The following three categories of limit are applied to fish species caught by recreational anglers.

Category 1 - Fish deemed to be at highest risk.
These are long-lived, slow-growing species which mature after four years, are semi-resident and vulnerable to localised depletion due to their life history, are of low abundance, or are highly targeted. Minimum size limits apply. In the case of dusky whaler sharks and some species of cod, maximum size limits apply and for tailor there are both minimum and maximum limits. There is a maximum mixed daily bag limit of seven individual fish per angler.

Category 2 - Fish deemed to be at medium risk.
These fish mature at two to three years, are moderately abundant, highly targeted and commonly found in the nearshore and estuarine environment. Minimum legal size limits apply. There is a maximum mixed daily bag limit of 16 individual fish per angler.

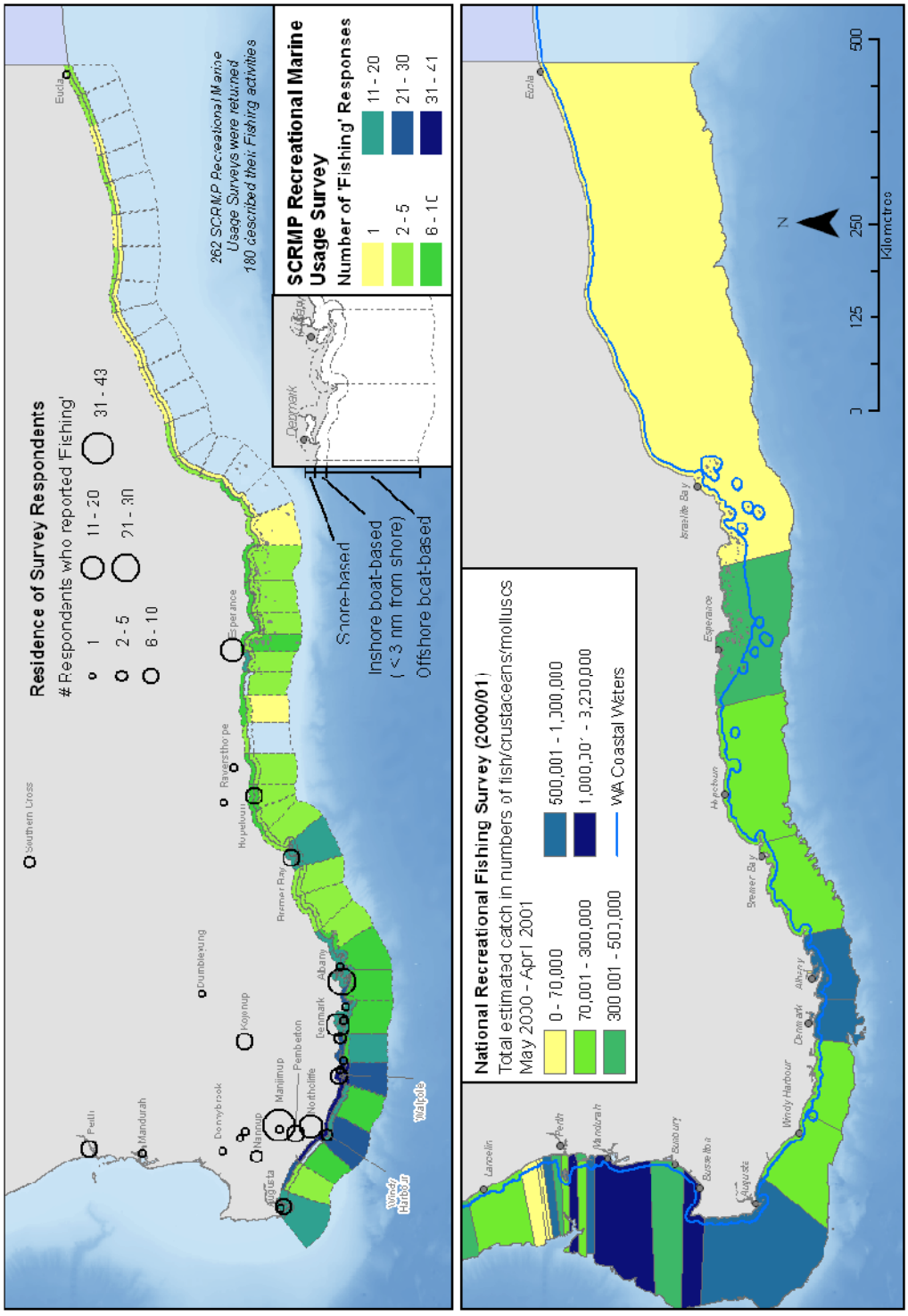


Figure 6: Recreational fishing on the south coast

For map source information see Appendix 4

Category 3 - Fish deemed to be at low risk.
These fish mature at one to two years, are present in high abundance, are distributed widely and are generally pelagic. No size limits apply. There is a maximum mixed daily bag limit of 40 individual fish per angler.

Minimum legal size and boat and bag limits apply to the catch of crustaceans (crabs, prawns and rock lobsters) and bag and boat limits apply for molluscs (including abalone, cockles, oysters, scallops mussels, squid, pipis, cuttlefish and octopuses) and sea urchins.

Rules also apply in relation to the use of fishing gear. Anglers are restricted to a maximum number of three hooks or three gangs of hooks per line. Spearfishing is permitted in marine waters and cobbler may be taken by hand spears in estuaries. Spearfishing is not permitted in any rivers or their tributaries. Crabbing is only permitted through the use of drop nets (a maximum 10 nets per boat applies), wire scoop nets, hand-held blunt wire hooks, or by hand.

The Department of Fisheries is responsible for ensuring compliance with recreational bag and size limits. Given the vast expanse of the south coast, a key focus of its compliance program is education and promotion of the benefit to the community of sustainable management of the State's fisheries. Particular emphasis is placed on fishing activities where compliance problems are known to exist. These include the recreational take of abalone, cockles and marine finfish as well as estuarine netting. The Department of Fisheries has offices in Albany and Esperance and staff from the Busselton office conduct regular patrols to the Windy Harbour and Augusta areas of the south coast. There are no offshore patrol vessels based on the south coast, however, inshore compliance monitoring is conducted from six-metre vessels based in Albany and Esperance. Larger patrol vessels can be tasked to provide an offshore compliance capacity when necessary.

A review of recreational fishing management arrangements for the south coast was conducted during 2005, with consultative workshops held at Walpole, Albany and Esperance. Strategies developed through this process and subsequently implemented include: new bag and category limit regime; increases in minimum size limits for bight redfish and tarwhine; banning of recreational set netting in ocean waters; and new management arrangements for recreational netting in estuarine waters. A comprehensive education program to inform the community of new management strategies was implemented in 2005/06.

Recreational Fishing Advisory Committees provide advice to the Minister for Fisheries on a broad spectrum of issues related to recreational fishing. A State-level committee is based in Perth and there are regional committees in the Esperance–Goldfields, Great Southern and South West regions. Recfishwest also represents the interests of Western Australian recreational fishers at the local, State and Federal level.

Challenges and Opportunities

- Integration of commercial, recreational and Aboriginal fisheries management.
- Increased recreational fishing pressure associated with population increases and provision of coastal infrastructure such as boats ramps, marinas and tourist facilities.
- Provision of safe access for recreational fishing by young people and those with restricted mobility (see *Marine Safety*).
- Increasing pressure on fish stocks due to improvements in recreational fishing technology.
- Impact of recreational fishing operations on marine species and habitats.
- Potential impact of marine conservation measures on recreational fisheries.
- Lack of data on recreational fishing effort and catch.
- Capacity for recreational fishers to assist with data collection for fisheries research and management.
- High cost of resourcing compliance activities.
- Difficulty in engaging with recreational fishers due to the fragmented nature of the sector.
- Conflicts with landowners and managers over recreational fishers accessing coastal locations.
- Management of any conflict between fishing sectors to facilitate the maintenance of sustainable fisheries.

Objectives

- To maintain a sustainable recreational fishing sector on the south coast.
- To increase benefits to participants and to the economy from a sustainable recreational fishing sector.
- To integrate recreational fishing with other marine sectors.

No. C2.2	Proposed Strategies for Recreational Fishing	Responsibility for Initiation	Timing of Initiation
	Sustainability		
S1	Continue to apply Integrated Fisheries Management approaches in south coast recreational fisheries.	DoF	Underway (WAG, AG)
S2	Encourage continuing research into the impacts of recreational fishing on south coast marine environments and species and the effective management of these impacts.	DoF, DEC	Underway (WAG, AG, TI)
S3	Promote the benefits of compliance, sustainable fishing and a healthy marine environment to recreational fishers and the community.	DoF	Years 3-5
S4	Provide input from a south coast perspective into the development of potential new catch management approaches such as boat limits, maximum size limits and gear restrictions.	DoF	Years 3-5
S5	Use adaptive Integrated Fisheries Management to accommodate any impacts on south coast recreational fisheries arising from management decisions applied in other regions.	DoF	Years 3-5
S6	Encourage investigation into methods of cost recovery to assist with funding the management of recreational fisheries.	DoF	Years 6-10
S7	Encourage the use of voluntary recreational log book catch returns by recreational fishers.	DoF	Years 3-5
S8	Continue to facilitate input from recreational fishers into the planning and management of recreational fishing activity on the south coast through representative bodies.	DoF	Underway (WAG, AG)
S9	Expand educational programs to promote sustainable fishing and the benefits of compliance.	DoF, NRMG	Underway (WAG, AG)
	Inter-sectoral coordination		
C1	Ensure recreational fishers have input into the proposed ecosystem-based fisheries management plan for State and Commonwealth waters of the south coast (see *Fishing – General*).	DoF	Years 1-2
C2	Identify priority areas for recreational fishing through the proposed marine value and usage mapping process (see *Cooperation and Integration*).	DoF	Underway (WAG, AG)
C3	Facilitate ongoing communication among recreational, commercial and Aboriginal fishers through a cross-sectoral Implementation Coordinating Group (see *Cooperation and Integration*).	DoF	Underway (WAG, AG, Ind)
C4	Use integrated fisheries management approaches to resolve conflicts between the commercial, recreational and Aboriginal fishing sectors.	DoF	Years 1-2
C5	Continue to seek adequate resources for recreational fishing compliance and education activities utilising staff and volunteers within the Department of Fisheries and other agencies.	ICG, NRMG	Underway (WAG, AG)

C6	Engage the recreational fishing sector in planning and managing all activities and developments likely to impact on the south coast marine environment or its users (see *Cooperation and Integration*).	DoF	Underway (WAG, AG)
C7	Promote the development of a code of conduct for recreational fishers accessing fishing locations on the coast.	DoF	Years 3-5

C2.3 Commercial Fishing

Context
Commercial fishing is part of the south coast's history and culture, having been one of the first economic activities in many localities at the time of settlement. The first commercial fishing ventures date back to the 1860s when John Hayes supplied fresh fish to the mail boats servicing Albany.

The value of commercial fisheries is generally quoted in terms of the monetary value to fishers, which does not take into account value adding or the broader socio-economic value of commercial fishing activity.

Major Commercial Fisheries
Today, the major commercial fisheries on the south coast are as follows:

Greenlip and Brownlip Abalone Managed Fishery
This is a dive-based fishery, with divers using a "hookah" (surface supplied breathing apparatus) and operating in shallow coastal waters. Divers operate from vessels less than nine metres in length. This is a quota managed fishery and is divided into three management areas between the South Australian border and the Busselton Jetty. Each management area has an annually revised Total Allowable Catch which is allocated to licence holders as Individually Transferable Quotas.

The estimated annual value to fishers for 2008 was $9.2 million.

Roe's Abalone Managed Fishery
This is also a dive-based fishery with Roe's abalone generally being found in the shallow limestone reef areas of the south coast. Divers operate from small boats as well as from the shore using off-road vehicles to gain access to the fishing areas. This fishery has six management areas and, as is the case with the greenlip/ brownlip fishery, the Total Allowable Catch is set annually and allocated to licence holders as Individually Transferable Quotas. Only three of the management areas are on the south coast and 47% of the annual Total Allowable Catch was allocated to this region in 2008.

The estimated annual value to south coast fishers for 2008 was $1.0 million.

Joint Authority Southern Demersal Gillnet and Demersal Longline Fishery
The term "demersal" refers to fish found on or near the bottom of the sea. This fishery uses two fishing methods:

- "gillnets", so-named because fish attempting to swim through are held behind the gill plate as the head passes through the net; and (to a lesser extent)
- "long lines" in which short lines carrying hooks are attached to a longer main line at regular intervals and are set at the seabed using weights.

This fishery targets sharks (primarily gummy and dusky whaler on the south coast) as well as scalefish (fish with scales).

The Joint Authority Southern Demersal Gillnet and Demersal Longline Fishery operates in both State and Commonwealth waters and is managed jointly by the Australian and Western Australian Governments.

Research into the Demersal Gillnet and Demersal Longline Fishery suggests a decline in dusky whaler breeding stock levels and increasing breeding stock levels for whiskery sharks. Biologists studying this fishery consider the impact on protected species and on stocks of bycatch to be acceptable and the gillnet catch sustainable.

New management strategies that set explicit effort ceilings for the fishery were implemented for this fishery in 2006. New regulations have also been introduced to manage the take of sharks in the "non target" fisheries where there is a bycatch of shark. The Department of Fisheries recognises the need for improved monitoring of the shark fishery to focus on catch size composition and tagging to update harvest rates, particularly for dusky whalers.

The estimated annual value to fishers for 2005-06 was $4.4 million.

South Coast Crustacean Fishery

This fishery uses pots or traps and operates between Augusta and the South Australian border. It is a multi-species fishery targeting southern rock lobster, western rock lobster and deep sea crab (including giant crabs), crystal crabs and champagne crabs. The South Coast Crustacean Fishery comprises the Windy Harbour/ Augusta Rock Lobster Fishery; the Esperance Rock Lobster Fishery; the rock lobster pot fishery which operates in the Albany and Great Australian Bight areas; and the Deep Sea Crab fishery. This fishery is currently (2010) undergoing a management review to implement a single management plan for the entire fishery. New management arrangements will seek to manage the potential effort and standardise the gear used in the fishery.

The estimated annual value to fishers for 2005-06 was $1.2 million.

South Coast Purse Seine Fishery

This fishery uses purse seine nets (which surround surface-schooling pelagic fish) and primarily targets pilchards but also catches yellow tail scad, Australian anchovy and maray. There are three primary management zones: Albany (including King George Sound), Bremer Bay and Esperance. This is a quota (output) managed fishery and the quota season runs from 1 July – 30 June each year. Catches are monitored monthly to provide data on their age-composition to assist with ensuring the sustainability of the fishery. The pilchard quota is set annually at a maximum of 10% of the spawning biomass in recognition of the significance of these small pelagic fish within the food-web.

During the 1990s, a *herpes* virus affected the pilchard population of the south coast and dramatically reduced numbers of this species. A Department of Fisheries research project funded by the Fisheries Research and Development Corporation has assessed potential future threats from this virus and based on modelling, it is considered unlikely that further episodes like those in the 1990s will occur.

Pilchard fishing effort is constrained by the low availability of suitably sized fish at times of market demand and this in turn limits the size of the fleet and associated infrastructure. The ability to supply the right sized product in the right quantities at the right time is a challenge for fishers. Most pilchards are used for recreational bait with the remainder used for tuna grow-out feed, commercial trap bait and pet food. There is unrealised potential for local processing for human consumption. This fishery also competes with the South Australian market.

The estimated annual value to fishers for 2005-06 was $1.87 million.

South Coast Estuarine Fishery

This fishery operates within many of the south coast's estuaries and uses gill nets, haul/seine nets, lines and traps. It targets multiple finfish species including cobbler (majority at 36% of the total), black bream, King George whiting, herring, southern sea garfish, sea mullet, flathead, as well as, molluscs and crustaceans. The fishery has access to a total of 13 south coast estuaries (Broke Inlet, Irwin Inlet, Wilson Inlet, Princess Royal Harbour, Oyster Harbour, Waychinicup Inlet, Beaufort Inlet, Gordon Inlet, Hamersley Inlet, Culham Inlet, Jerdacuttup Lakes, Oldfield Inlet and Stokes Inlet). In addition, Hardy Inlet is part of the West Coast Estuarine Fishery. Only 10 of the estuaries are regularly fished and most of the rivers entering these estuaries are closed to commercial fishing.

The Wilson Inlet is the major focus of the fishery with 51% of the fishing effort in this estuary. Both catch and effort in this fishery have declined as a result of voluntary buy back of licences (down from 66 in 1987 to 25 in 2005 and subsequently). The adjoining Walpole and Nornalup Inlets are closed to commercial fishing and were declared a marine park in 2009.

Environmental factors are considered to be the key threats to sustainable fish stocks in the estuaries of the south coast. Nutrient enrichment of estuarine ecosystems, loss of habitat in catchment areas leading to high sediment loads in rivers and reductions in river flows as a result of low rainfall all lead to lower fish diversity and fishery production in estuarine ecosystems. Pressure to extract or divert water for urban, industrial and agricultural use will compete with the needs of fish and fisheries. The environmental flow requirements of estuarine fish are poorly understood at present.

The estimated annual value to fishers for 2008 was $1,208,000.

Smaller Commercial Fisheries
A number of smaller commercial fisheries also operate on the south coast:

South Coast Salmon and South-West Coast Salmon
This fishery uses seine nets to surround schools of adult fish off the beach using row boats or jet powered boats, predominantly between February and May. On the south coast, licence holders have access to a single nominated beach between Shoal Cape and Cape Beaufort. There are 18 salmon teams authorised to operate on the south coast and approximately 60 deckhands assist in the catching and loading of salmon each year. In 2008, the annual catch on the south coast was 879 tonnes.

Annual surveys of juvenile salmon recruitment are conducted at six sites along the south and lower west coast to generate an overall index of recruitment, which is used to forecast fishery catches three to four years in advance.

The cyclic nature of catches in this fishery may reflect large-scale environmental factors such as the impact of the variability of the Leeuwin Current on recruitment. Declining catch rates since the 1990s are likely to be a result of market forces rather than a reflection of declining stock level.

The estimated annual value to fishers for 2008 was $413,000.

South Coast Trawl Fishery
The south coast inshore trawl fishery operates all year and is located east of Cape Leeuwin. Scallops and finfish are the major target species. The main fishing method used is otter trawling, where nets set at various depths depending on the target species are towed behind a boat. Catch trend data is variable due to the nature of the species fished, with scallops tending to occur in distinct patches due to transportation of larvae into different areas by variable water circulation.

Trawling has the potential to adversely affect the marine environment but the relatively low productivity and abundance of species capable of trawl capture restricts where this fishery can operate. Fishers also actively avoid rocky substrate to minimise damage to nets. The small limited-entry scallop trawl fishery is the only State-managed activity likely to have a significant physical interaction with the seafloor.

The estimated annual value to fishers for 2007 was $900,000, though the catch varies considerably depending on seasonal conditions.

Australian Herring
This fishery operates throughout the south coast marine region and uses mainly beach-based herring trap nets at a limited number of beaches, mainly during the autumn migration. Gill nets and beach seine are used to a lesser extent.

Adult fish are targeted by fishers with beach-based nets as well as by south coast estuarine fishers and other commercial fishers holding an unrestricted boat licence along the south coast. Some 88% of the 2008 commercial catch was obtained using herring trap nets, which can only be used by holders of nominated fishing boat licences. The herring trap net fishery is closed during the peak salmon migration period between 10 February and 25 March.

The total number of licenced teams reached a peak of 30 in 1984, and has since been reduced by 63% though a series of Government buy-back initiatives to the current level of 11 teams now licensed to operate trap nets for herring at 10 separate beaches.

The management arrangements for this fishery are assessed annually based on trends in the commercial catch and known biological characteristics of the species. Research indicates that there is a single herring breeding stock between Shark Bay in Western Australia and Gippsland in South Australia. Protected coastal embayments provide nursery areas and sources of recruitment for herring. Annual surveys of juvenile herring recruitment are conducted at six sites along the south and lower west coast to generate an overall index of recruitment, used to forecast fishery catches two to three years in advance. The south coast accounted for 87% of the State's herring catch in 2008.

The estimated annual value to fishers for 2008 was $301,000.

Other Fisheries

Wetline (hook and line) fishing is also undertaken by licensed commercial fishers, mainly concentrated off Augusta, Windy Harbour, Albany, Bremer Bay and Esperance. They focus on pink snapper, red fish, hapuku, samsonfish, wobbegong, Australian herring, Western Australian dhufish, sea garfish and cod. This fishery operates throughout the south coast marine region.

The marine aquarium fish and specimen shell fisheries are Statewide fisheries that have a significant proportion of fishing activity based on the south coast.

Management of Commercial Fishing

Commercial fishing activity is spread widely throughout the south coast region (see Figures 7, 8 and 9). Key south coast commercial fishing areas are shown in Figure 10. South coast commercial fishing vessel operators often hold a number of licences to diversify their fishing effort and maintain a viable year-round fishing operation. The total reported commercial catch in south coast waters is indicated in Figure 7.

Commercial fishing activity is managed through legislation and fisheries management arrangements mechanisms including:

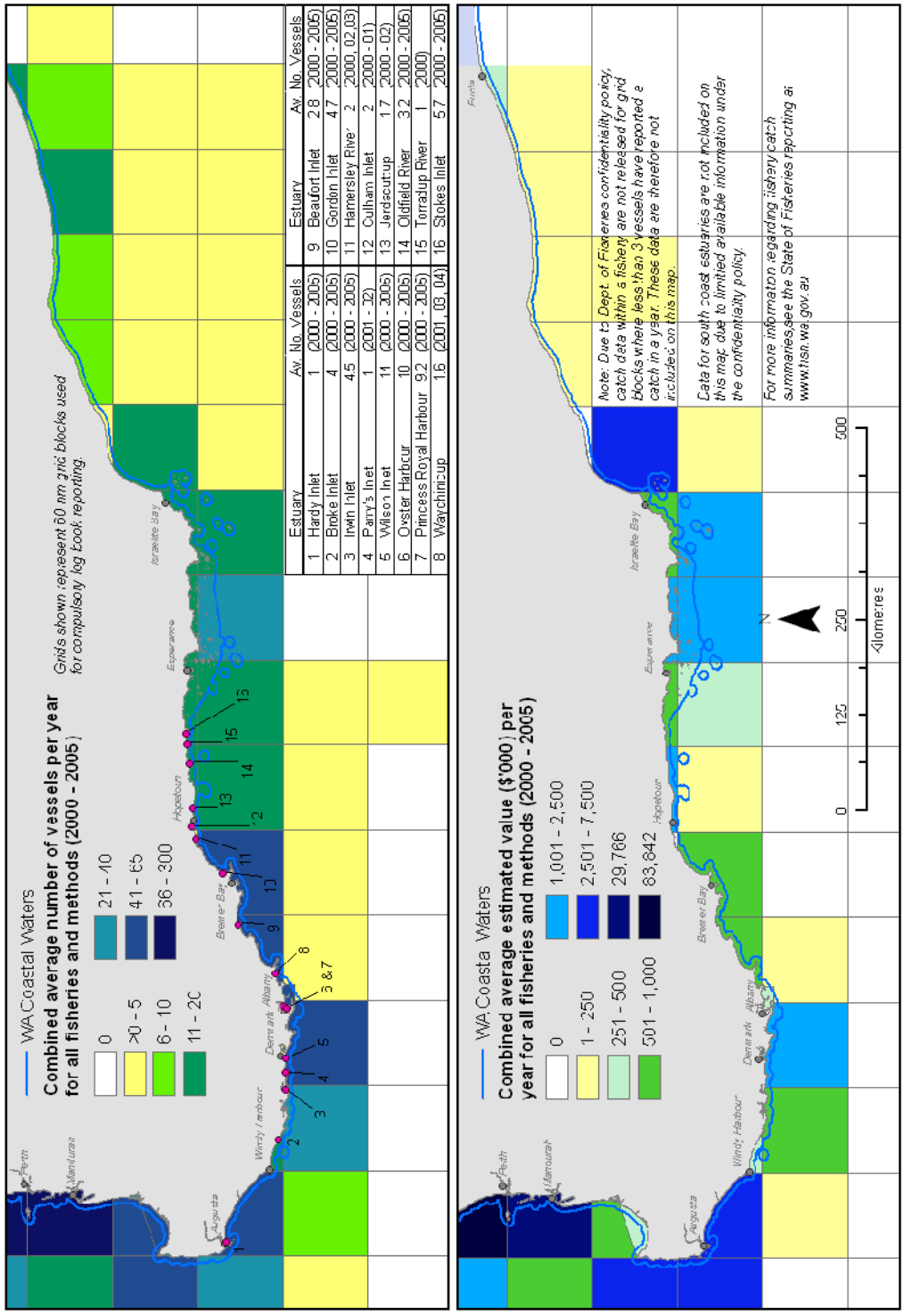
- compliance with fishery specific management plans;
- Section 43 orders under the *Fish Resources Management Act 1995* which provide for spatial and/or seasonal closures to specific types of fishing activity;
- input controls such as limited entry, pot numbers, individual size limits and return of females carrying eggs (the latter in the case of the rock lobster fishery);
- output controls in the form of Total Allowable Commercial Catch set annually for each species and allocated to licence holders as Individually Transferable Quotas (as in the case of abalone and pilchards) and subject to annual review;
- fishing boat and fishery licence conditions; and
- fishing gear restrictions and time limits.

All export fisheries are required to complete a comprehensive assessment to identify any potential sustainability risks requiring direct management, in accordance with Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* requirements. These assessments are audited annually and full reassessments are required regularly (generally after three years).

Overall demand for commercially-caught fish is increasing. A 1999 study of fish consumption in Perth found that 79% of respondents bought either all or most of their fish through commercial outlets rather than catching it themselves.

Some south coast commercial fisheries have experienced significant catch declines in the past few years, especially for southern rock lobster (which has suffered a decline of almost 50% in the last 10 seasons). There is a need to determine if this is a sustainability issue, or a reduction in fishing effort. This is difficult to assess accurately as it is a small multi-species fishery subject to environmental fluctuations and unknown spawning stock levels in adjacent South Australian waters.

Ongoing research into incidental by-catch of protected species and potential mitigation methods is underway (Western Australian Fishing Industry Council, Murdoch University, Department of Fisheries, Department of Environment and Conservation, Ocean Watch, Conservation Council, South Coast Natural Resource Management Inc.). Seabirds (fleshy-footed shearwaters) and to a lesser extent, dolphins are attracted to purse seine fishing operations in King George Sound. They occasionally



	Estuary	Av. No. Vessels	
1	Hardy Inlet	1	(2000 - 2005)
2	Broke Inlet	4	(2000 - 2005)
3	Irwin Inlet	4.5	(2000 - 2005)
4	Parry's Inlet	1	(2001 - 32)
5	Wilson Inlet	11	(2000 - 2005)
6	Oyster Harbour	10	(2000 - 2005)
7	Princess Royal Harbour	9.2	(2000 - 2005)
8	Waychinicup	1.6	(2001,03, 04)
9	Beaufort Inlet	2.8	(2000 - 2005)
10	Gordon Inlet	4.7	(2000 - 2005)
11	Hamersley River	2	(2000, 02,03)
12	Culham Inlet	2	(2000 - 01)
13	Jerdacuttup	1.7	(2000 - 02)
14	Oldfield River	3.2	(2000 - 2005)
15	Torradup River	1	(2000)
16	Stokes Inlet	5.7	(2000 - 2005)

Figure 7: South coast commercial fishing overview

For map source information see Appendix 4

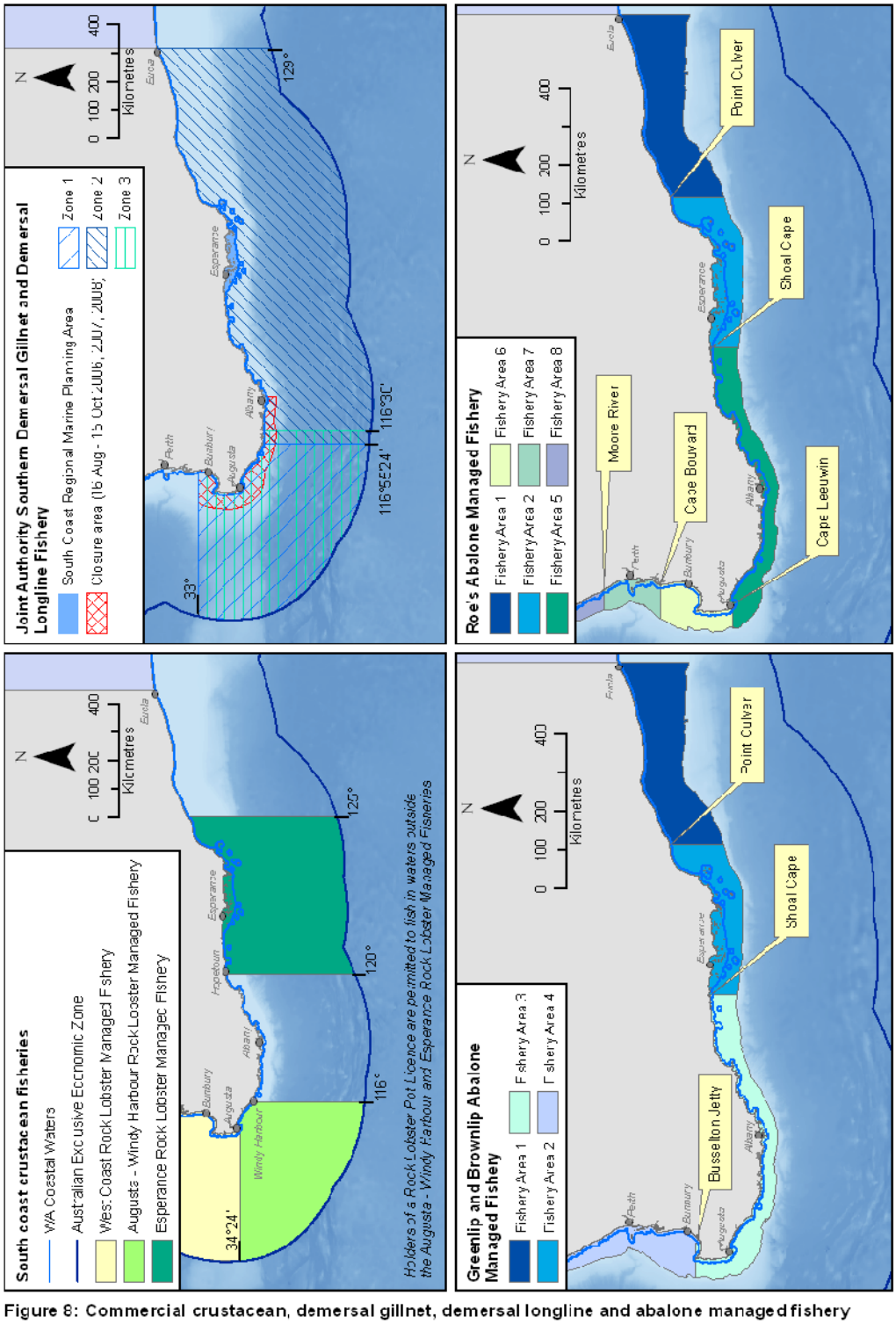


Figure 8: Commercial crustacean, demersal gillnet, demersal longline and abalone managed fishery boundaries

For map source information see Appendix 4

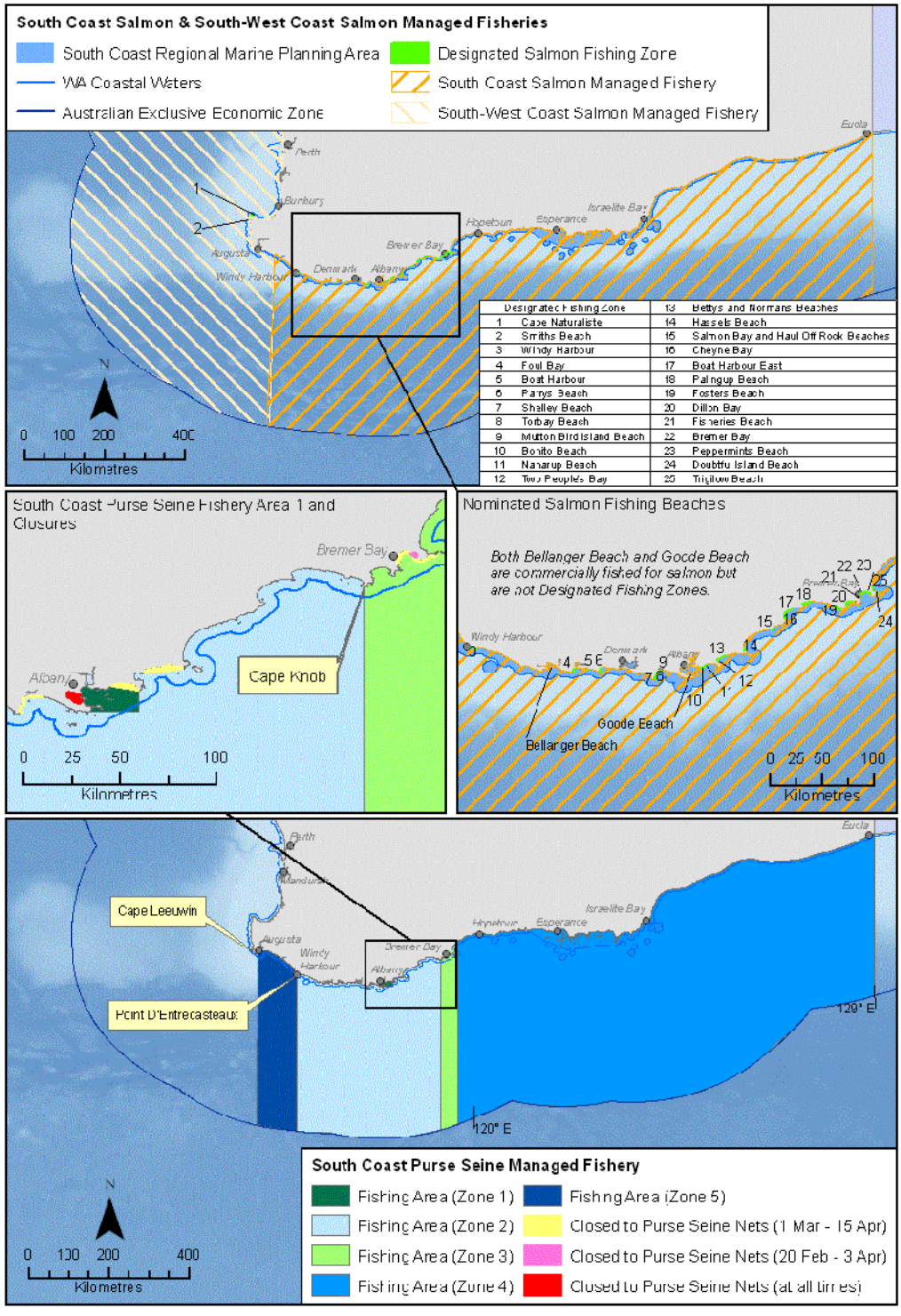


Figure 9 : Commercial salmon and purse seine managed fishery boundaries

For map source information see Appendix 4

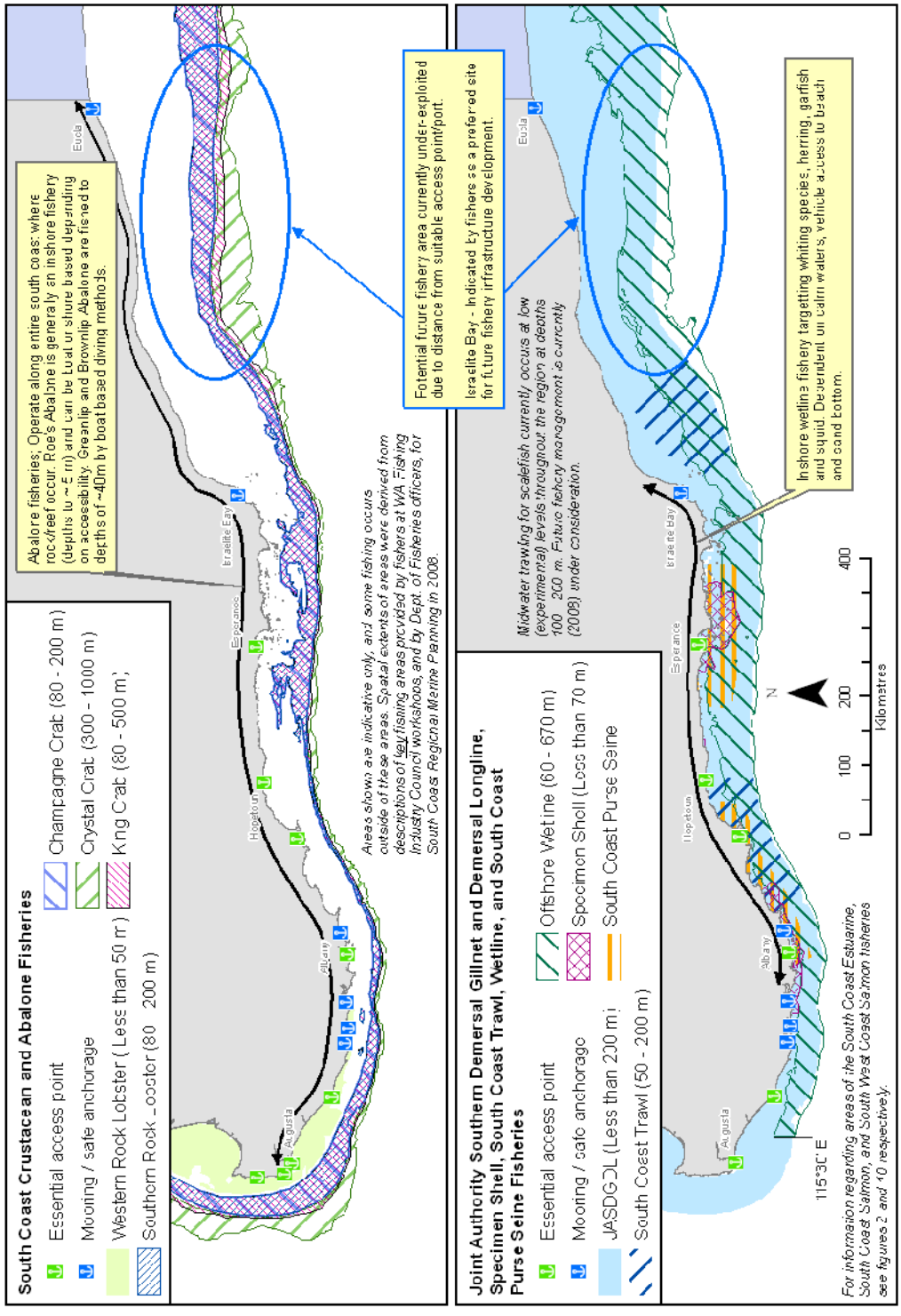


Figure 10: Key south coast commercial fishing areas

For map source information see Appendix 4

become entangled in nets and sometimes drown. An observer program was implemented in 2008 and potential methods to minimise impact are being investigated. Specially protected species such as New Zealand fur seals and Australian sea lions occasionally interact with herring netting. The operators of this fishing gear are able to free caught animals with no mortality although nets are often damaged. Sharks, including the threatened great white, are at risk of becoming entangled in fishing nets set to catch other species. Ropes from pots and set lines can also pose a hazard to marine mammals such as whales. The incidence of mortality of sea lion pups in rock lobster pots in south coast fisheries is extremely low, however, new management arrangements will consider the need for seal exclusion devices in rock lobster pots.

The Department of Fisheries adopts a risk-management approach to prioritise and plan fisheries compliance activities. A major focus of compliance is on illegal, unlicensed and unregulated operations, driven by concern for sustainability of stocks and high value of product on the "black market". Fisheries compliance programs also target commercial fisheries to ensure compliance with gear, season and size restrictions and adherence to licensing and quota restrictions for the relevant fisheries. Foreign fishing vessels do not currently (2010) operate within the State waters of the south coast.

Challenges and Opportunities

- Long-term viability of the commercial fishing industry.
- Sustainability of fish stocks.
- Integration of commercial, recreational and Aboriginal fisheries management.
- Disease risks to fish stocks.
- Management of bycatch problems.
- Impact of commercial fishing operations on marine plants, animals and habitats.
- Impact of marine conservation measures on commercial fisheries.
- Difficulty of quantifying the overall contribution of commercial fishing to the economy.
- Decline in numbers of south coast commercial fishers supplying fish to markets and associated infrastructure decline.
- Decline in south coast commercial fishing catches.
- Market variability.
- High cost of resourcing compliance activities.
- Management of any conflict between fishing sectors to ensure fisheries are sustainable.
- High overall dependence on commercially caught fish by the Western Australian population.
- Growing demand for fish in the Western Australian retail and hospitality sectors.

Objectives

- To maintain a viable and sustainable commercial fishing industry on the south coast.
- To increase benefits to the economy and to consumers from a sustainable recreational fishing sector.
- To integrate commercial fishing with other marine sectors.

No. C2.3	Proposed Strategies for Commercial Fishing	Responsibility for Initiation	Timing of Initiation
	Sustainability		
S1	Apply Integrated Fisheries Management approaches in south coast commercial fisheries.	DoF	Underway (WAG, AG, Ind)
S2	Encourage continuing research into the impacts of commercial fishing on south coast marine environments and species and the effective management of these impacts.	DoF, DEC	Underway (WAG, AG, TI, Ind)
S3	Encourage continuing research into environmental influences on commercial fish stocks on the south coast and use adaptive management approaches to fine-tune commercial fishing activity and management in response to findings.	DoF	Underway (WAG, AG, TI, Ind)
S4	Refine management regimes for commercial fishing on the basis of the results of monitoring and research programs.	DoF	Years 3-5

S5	Use adaptive Integrated Fisheries Management to accommodate any impacts on south coast commercial fisheries arising from management decisions applied in other regions.	DoF	Years 3-5
S6	Provide public education programs about the commercial fishing industry, its management, its economic and consumer benefits and its impacts.	DoF, Fishing industry bodies	Years 3-5
S7	Introduce measures to manage bycatch in commercial fisheries as required.	DoF	Years 3-5
S8	Encourage research into further value-adding opportunities for south coast commercial fish catches.	DoF, Fishing industry bodies	Years 3-5
S9	Encourage research into opportunities for new sustainable commercial fisheries on the south coast.	DoF, Development Commissions	Years 3-5
S10	Determine the full economic value of south coast commercial fisheries and disseminate this information within the community.	DoF, Fishing industry bodies, Development Commissions	Years 3-5
	Inter-sectoral coordination		
C1	Ensure commercial fishers have input into the proposed integrated fisheries management plan for State and Commonwealth waters of the south coast (see *Fishing – General*)	DoF	Underway (WAG, AG, Ind)
C2	Identify priority areas for commercial fishing through the proposed marine value and usage mapping process (see *Cooperation and Integration*).	DoF	Underway (WAG, AG, Ind)
C3	Facilitate ongoing communication among recreational, commercial and Aboriginal fishers through a cross-sectoral Implementation Coordinating Group (see *Cooperation and Integration*).	DoF	Underway (WAG, AG, Ind)
C4	Use integrated fisheries management approaches to resolve conflicts between the commercial, recreational and Aboriginal fishing sectors.	DoF	Years 1-2
C5	Coordinate Government interaction with commercial fishers across agencies and ensure ongoing communication with affected parties.	DoF	Years 3-5
C6	Engage the commercial fishing sector in planning and management of all activities and developments likely to impact on the south coast marine environment or its users (see *Cooperation and Integration*).	DoF	Underway (WAG, AG, Ind)
C7	Consider social, economic and environmental impacts on commercial fishers when planning and managing for marine sectors.	DoF	Years 1-2
C8	Continue to seek adequate resources for commercial fishing compliance activities utilising staff within the Department of Fisheries and other agencies.	ICG	Underway (WAG, AG)

C2.4 Aboriginal Fishing

Context

Aboriginal people have fished the shores of the south coast for thousands of years (see also *Preamble* and *Aboriginal Heritage*) and maintain a close association with the sea and its resources today. Fishing the estuarine and marine waters of the south coast is an important part of life for many Aboriginal people, whether they reside on the south coast or elsewhere.

In 2000, the Western Australian Government established a working group to assist in the development of a draft Aboriginal Fishing Strategy in consultation with Aboriginal communities, organisations and

individuals throughout the State. The objectives of the Aboriginal Fishing Strategy Working Group were to recommend to Government a strategy for:

- the inclusion of traditional and cultural fishing practices within a framework of planned sustainable use of fish and fish habitat; and
- greater involvement of Aboriginal people in the fisheries sector, including commercial fishing, aquaculture, the aquatic charter industry and fisheries management.

The following key principles were adopted in the development of the draft report.

- Sustainability and biodiversity objectives are paramount. The recognition of Aboriginal fishing rights and practices does not exceed the obligation to protect fish for future generations.
- Aboriginal people have continuing rights and responsibilities as the first people of Western Australia, including traditional ownership and connection to land and waters.
- Strategies must be consistent with the objects of the *Fish Resources Management Act 1994*, *Pearling Act 1990* and the *Native Title Act 1993*.
- Strategies must be consistent with a holistic, integrated approach to fisheries management and be accountable within an Ecologically Sustainable Development (ESD) reporting framework.
- Strategies must be practical and able to be implemented within the existing legal, political and social structures of Western Australia.

These objectives and principles are consistent with the aims of this strategic framework. In 2003, the Western Australian Government released the *Draft Aboriginal Fishing Strategy* which states that "customary fishing applies to persons who are of Aboriginal descent and who are fishing for the purpose of satisfying personal, domestic, ceremonial, educational or non-commercial communal needs". The final strategy has not yet been released (2010).

Challenges and Opportunities

- Engaging Aboriginal people in decisions affecting their fishing interests.
- Integrating commercial, recreational and Aboriginal fisheries management.
- Consideration of Aboriginal cultural imperatives in the design and implementation of fishing regulations (e.g. funerals are regularly held on Fridays, making travel to fishing locations difficult on that day).
- Management of any conflict between fishing sectors to facilitate the maintenance of sustainable fisheries.

Objectives

- To maintain sustainable Aboriginal fishing on the south coast.
- To integrate Aboriginal fishing with other marine sectors.

No. C2.4	Proposed Strategies for Aboriginal Fishing	Responsibility for Initiation	Timing of Initiation
	Sustainability		
S1	Continue to facilitate sustainable Aboriginal fishing on the south coast.	DoF	Underway (WAG, AO)
S2	Seek resources to enable effective engagement of Aboriginal people in fisheries management.	DoF	Years 3-5
S3	Provide culturally appropriate contexts in which Aboriginal people can provide input to fisheries management.	DoF	Years 3-5
S4	Consider Aboriginal cultural imperatives in the design and implementation of fishing regulations.	DoF	Years 3-5
S5	Seek finalisation of the Aboriginal Fishing Strategy.	DoF	Years 1-2
	Inter-sectoral coordination		
C1	Ensure Aboriginal people have input into the proposed integrated fisheries management plan for State and Commonwealth waters of the south coast (see *Fishing – General*).	DoF	Underway (WAG, AO)

C2	Identify priority areas for Aboriginal fishing through the proposed marine value and usage mapping process (see *Cooperation and Integration*).	DoF	Years 3-5
C3	Facilitate ongoing communication among recreational, commercial and Aboriginal fishers through a cross-sectoral Implementation Coordinating Group (see *Cooperation and Integration*).	DoF	Underway (WAG, AG, AO, Ind)
C4	Use integrated fisheries management approaches to resolve conflicts between the commercial, recreational and Aboriginal fishing sectors.	DoF	Years 1-2
C5	Engage with Aboriginal fishers in planning and management of all activities and developments likely to impact on the south coast marine environment or its users (see *Cooperation and Integration*).	DoF	Years 3-5

C2.5 Marine Aquaculture

Context

Aquaculture involves the breeding, keeping, hatching or culturing of fish and shellfish for commercial purposes. The Department of Fisheries is responsible for the licensing, regulation and management of the aquaculture industry. The Aquaculture Development Council, an independent Ministerial Advisory Council, is charged with promoting and developing the aquaculture industry in Western Australia. Both parties undertake research and where relevant, work cooperatively on projects to ensure the principles of ecologically sustainable development are incorporated.

The main current activities on the south coast are mussel and oyster farming in Oyster Harbour and Wilson Inlet; abalone at Bremer Bay and an oyster hatchery at the Albany Aquaculture Park (see Figure 11). An abalone aquaculture development is being planned in the Augusta area.

It is recognised that most sheltered nearshore sites suitable for aquaculture are fully exploited and further attention needs to be given to the suitability of open ocean aquaculture ventures. Sea cage aquaculture on the south coast is restricted by its high wave energy environment and the limited availability of protected deep water typically required. Recently developed mooring and cage systems are more able to successfully withstand ocean forces. Issues such as remote maintenance, automatic feeding, environmental monitoring and data management need to be further investigated.

The network of boat ramps, boat harbours and maritime facilities provided by the Department of Transport supports marine aquaculture by providing safe access to the Southern Ocean (see *Coastal Development*). Boat harbours are usually managed by the Department of Transport, with boat ramps administered by Local Authorities. Figure 19 shows the location of maritime facilities along the south coast.

Most recent aquaculture developments on the south coast have been focused on land-based raceway culture of abalone using pumped seawater.

Aquaculture ventures along the south coast are required to comply with the following:

- Aquaculture Plan for the Recherche Archipelago, which identified areas with significant potential for aquaculture through a public consultation process and sustainable development principles;
- Ministerial Policy Guideline Number 8, which provides a framework for the assessment of applications for aquaculture (and pearling) proposals in Western Australian waters; and
- on-going monitoring and management requirements of the Department of Fisheries, in accordance with aquaculture license conditions imposed by the Department following completion of approval processes.

Challenges and Opportunities

- Potential for release of contaminants, introduced marine organisms, pathogens and/or high levels of nutrients from aquaculture developments if not managed appropriately.
- Community concern about the potential impacts of marine aquaculture on marine water quality and the marine environment.

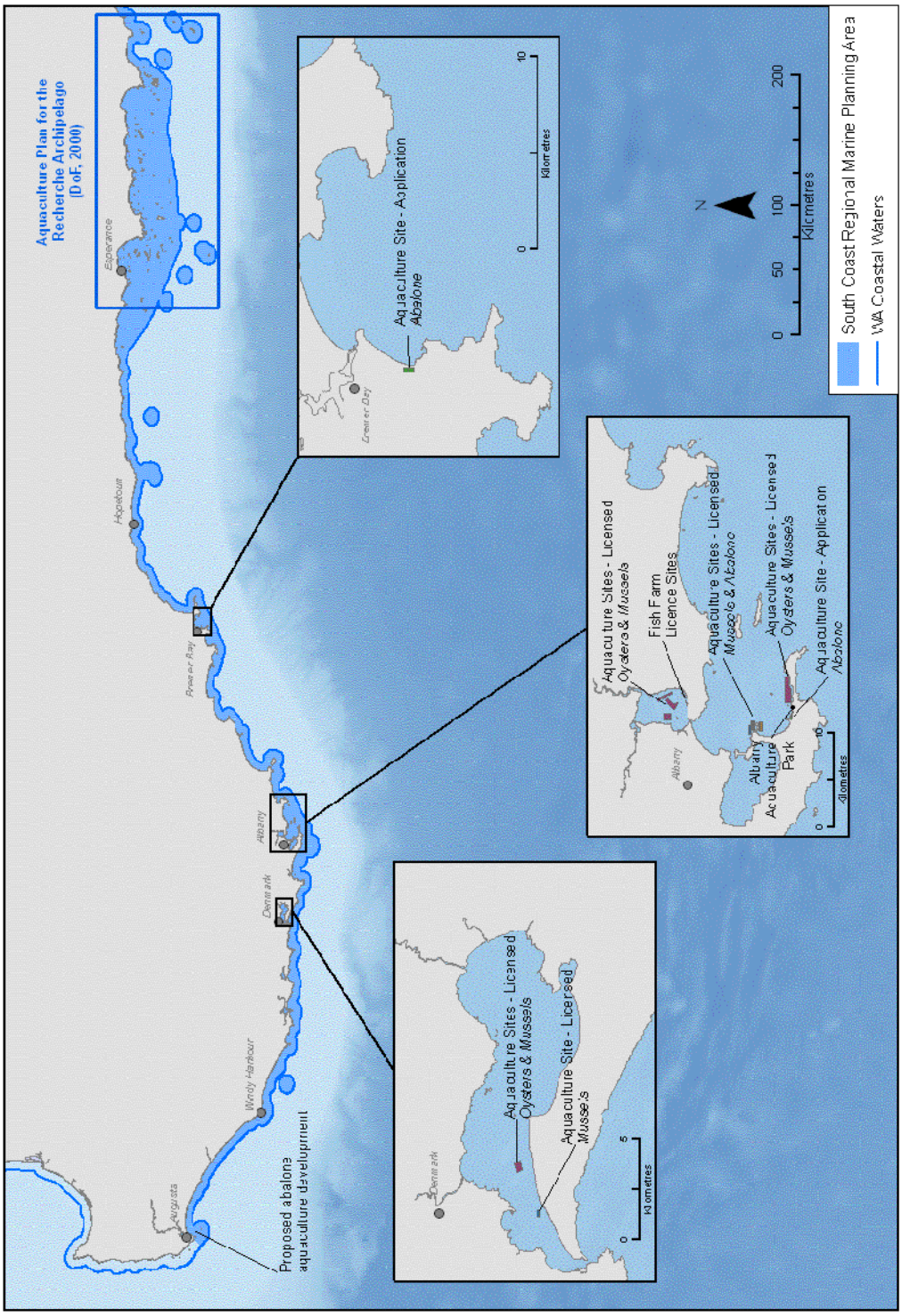


Figure 11: Marine aquaculture on the south coast

For map source information see Appendix 4

- High energy nature of much of the south coast.
- Remoteness from markets of some suitable south coast locations.

Objective
- To develop a sustainable aquaculture industry managed in accordance with the principles of Ecologically Sustainable Development.

No. C2.5	Proposed Strategies for Marine Aquaculture	Responsibility for Initiation	Timing of Initiation
	Sustainability		
S1	Establish standards and monitoring procedures for benthic impacts of marine aquaculture.	DoF, DEC	Years 1-2
S2	Continue to monitor and manage the impacts of all marine aquaculture developments on the marine environment.	DoF, DEC	Underway (WAG, Ind)
S3	Encourage further research into sustainable marine aquaculture developments suited to the south coast.	DoF	Underway (WAG, Ind)
S4	Engage marine stakeholders and members of the public in planning and management for aquaculture developments on the south coast.	DoF	Years 1-2
S5	Consider aesthetic impacts in planning for proposed marine aquaculture developments.	DoF	Years 3-5
S6	Investigate the potential for ecologically sustainable sea cage aquaculture on the south coast through the proposed marine value and usage mapping process (see *Cooperation and Integration*).	DoF	Years 3-5
S7	Utilise experience in other marine locations in assessing aquaculture proposals for the south coast.	DoF	Years 1-2
	Inter-sectoral coordination		
C1	Identify priority areas for marine aquaculture through the proposed marine value and usage mapping process (see *Cooperation and Integration*).	DoF	Underway (WAG, Ind)
C2	Engage the marine aquaculture sector in planning and management of all activities and developments likely to impact on the south coast marine environment or its users (see *Cooperation and Integration*).	DoF	Underway (WAG, Ind)
C3	Ensure integrated planning for marine-based infrastructure along the south coast (see also *Resource Development* and *Renewable Energy*).	ICG	Years 1-2

C2.6 Aboriginal Heritage

Context
The Aboriginal people of the south coast of Western Australia are predominantly from the Noongar (from Cape Leeuwin to east of Esperance) and the Mirning (further east across the southern Nullarbor Plain to the South Australian border and beyond) groups. Since their arrival on the south coast, Aboriginal people have engaged in fishing and collecting shellfish, crustaceans and other marine resources. Connections with estuaries and the sea are still strong among Aboriginal people today.

Before the end of the last glacial maximum, some 6,000-7,000 years ago, the coast was near the continental shelf break, tens of kilometres further out than it is today. Aboriginal people lived on what is now the seafloor and the many islands of State waters of the south coast. South coast rivers were used as travel routes from inland areas to the coast and many are now registered Aboriginal sites. The sea and tidal inlets, in particular, provided a wealth of resources for Aboriginal people.

In addition to their strong attachment to the lands and waters of the south coast, Aboriginal people have always had special relationships with the plants and animals of marine waters. Whales hold a unique place in Aboriginal lore and dolphins are known to have assisted people in their fishing activities by driving salmon to the shore.

Aboriginal people have left numerous visible signs of their long occupation of this coast including fish traps, shell middens, ceremonial grounds and burial sites (see Figure 12). The *Aboriginal Heritage Act 1972* provides automatic protection for all places and objects (referred to as Aboriginal sites) in Western Australia that are important to Aboriginal people because of connections to their culture. Aboriginal sites, whether registered or not, are protected under the Act. The presence of an Aboriginal site places restrictions on what can be done in an area. Anyone proposing to carry out research, development or other activities must investigate whether there is an Aboriginal heritage site in the area. Under the Act it is an offence to excavate, damage, destroy, conceal or in any way alter an Aboriginal site without permission from the Minister for Indigenous Affairs.

In addition to Aboriginal sites, there are many story lines, song lines and legends associated with the lands and waters of this coast.

Native Title claims have been filed along the south coast, with some of these including marine waters (see Figure 12).

See also coverage under *Aboriginal Fishing*.

Challenges and Opportunities

- Maintenance of access to and protection of heritage sites.
- High levels of public access to heritage places entailing the potential for damage to sites.
- Impacts of terrestrial land use practices on water quality and fish stocks.
- Impacts on burial sites located in coastal dunes.
- Likely existence of numerous unregistered sites that, despite being legally protected under the Aboriginal Heritage Act, may not be receiving protection in practice due to lack of knowledge as to their whereabouts.
- Desire of Aboriginal people to have freedom to conduct cultural activities.
- Maintenance of and respect for cultural connections and stories.
- Recognition of relationship between Aboriginal people and whales.
- Recognition of relationship between Aboriginal people and dolphins (including help with salmon fishing).
- Protection of story lines and song lines.
- Aboriginal involvement in decision making on matters affecting access to and protection of marine resources and habitat.
- Resourcing Aboriginal engagement.
- Protection of Aboriginal traditional knowledge and locations of sensitive Aboriginal heritage sites.
- Provision of a culturally appropriate context in which Aboriginal people can provide input to marine planning and management.

Objectives

- To engage Aboriginal people in all aspects of marine planning and management.
- To protect Aboriginal coastal sites.
- To respect continuing Aboriginal spiritual connections to the south coast.
- To maintain Aboriginal customary practices on the south coast.

No. C2.6	Proposed Strategies for Aboriginal Heritage	Responsibility for Initiation	Timing of Initiation
	Sustainability		
S1	Ensure registers of all known Aboriginal sites are consulted before developments are approved.	DIA	Underway (WAG, AO)

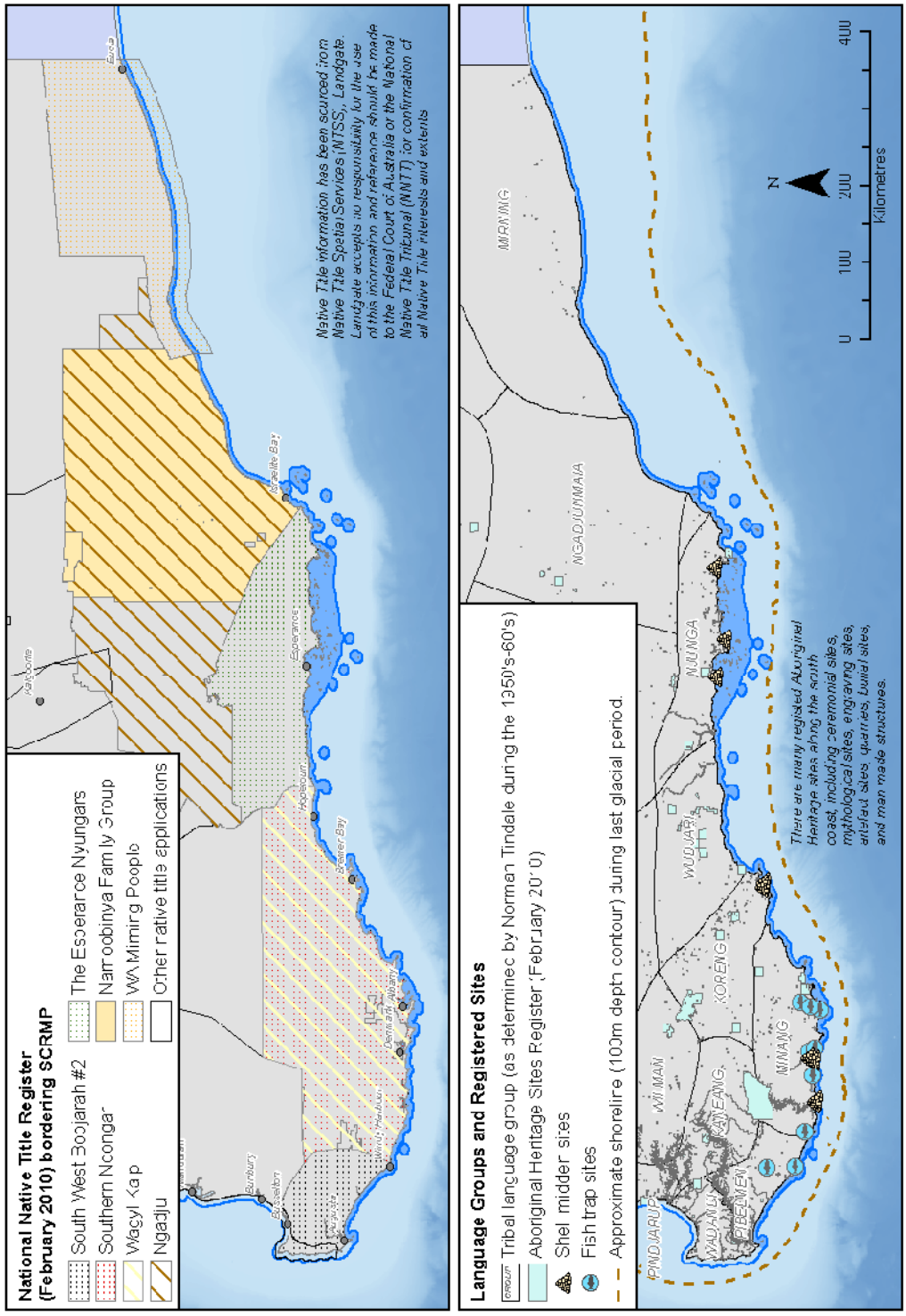


Figure12: South coast native title applications, Aboriginal language groups and registered heritage sites

For map source information see Appendix 4

S2	Encourage Aboriginal elders to make known the locations of additional significant sites.	DIA	Years 3-5
S3	Expand public education programs on the values and protection of Aboriginal sites.	DIA	Years 1-2
S4	Ensure consultation with Aboriginal elders before coastal or marine developments are approved.	DIA	Underway (WAG, Ind)
S5	Encourage developers/ agencies to make direct contact with representative organisations such as Heritage Reference Groups.	ICG	Years 1-2
S6	Facilitate the passing of cultural information from the older generation to young Aboriginal people.	DIA	Years 3-5
S7	Facilitate Aboriginal cultural tours where appropriate.	DIA	Years 6-10
S8	Encourage the continued collection of oral histories from Aboriginal elders.	DIA	Underway (WAG, AO)
S9	Ensure the involvement of Aboriginal people in the design of culturally appropriate engagement approaches.	DIA	Years 3-5
S10	Seek adequate resources for engagement of Aboriginal people in planning for and management of the marine environment.	ICG	Years 3-5
	Inter-sectoral coordination		
C1	Identify priority marine areas for Aboriginal people through the proposed marine value and usage mapping process (see *Cooperation and Integration*) and ensure appropriate protection of this information.	ICG	Underway (WAG, AO)
C2	Engage Aboriginal people in planning and management of all activities and developments likely to impact on the south coast marine environment or its users (see *Cooperation and Integration*).	ICG	Underway (WAG, AO)
C3	Engage Aboriginal people in coastal land use planning and management (e.g. with respect to use of fire).	ICG	Underway (WAG, AO)

C2.7 Maritime Heritage

Context
The first Europeans to sail along Western Australia's south coast are believed to have been Dutch mariners in the 1600s, but it is possible that even earlier visits by European and Asian explorers may have occurred. The south coast of Western Australia was colonised in the nineteenth century by European people who relied on the sea for their living. Sealers, whalers and fishers were among the first Europeans to move to this coast. With its rich maritime history, the south coast of Western Australia has many sites of maritime heritage significance. Sites include shipwrecks, whaling stations, sealers ovens, ports, historic jetties, anchorages and shore-based camps (see Figure 13). Sites of Aboriginal significance are covered under *Aboriginal Heritage*.

Coverage of maritime heritage sites in Australian waters is complex. In Western Australia, the State's *Maritime Archaeology Act 1973* covers all shipwrecks before 1900 in "State waters" (see below) and all objects and sites on land. The Commonwealth *Historic Shipwrecks Act 1976* covers all shipwrecks over 75 years old in "Commonwealth waters". In this instance, Commonwealth waters extend to the low water mark, but exclude rivers and enclosed bays. This means that many sites on the south coast, though within Western Australian marine waters, fall under the jurisdiction of Commonwealth legislation.

The Western Australian Maritime Museum is responsible for maritime heritage sites and maintains a database of key sites, however, it is a small organisation with limited capacity for on-ground

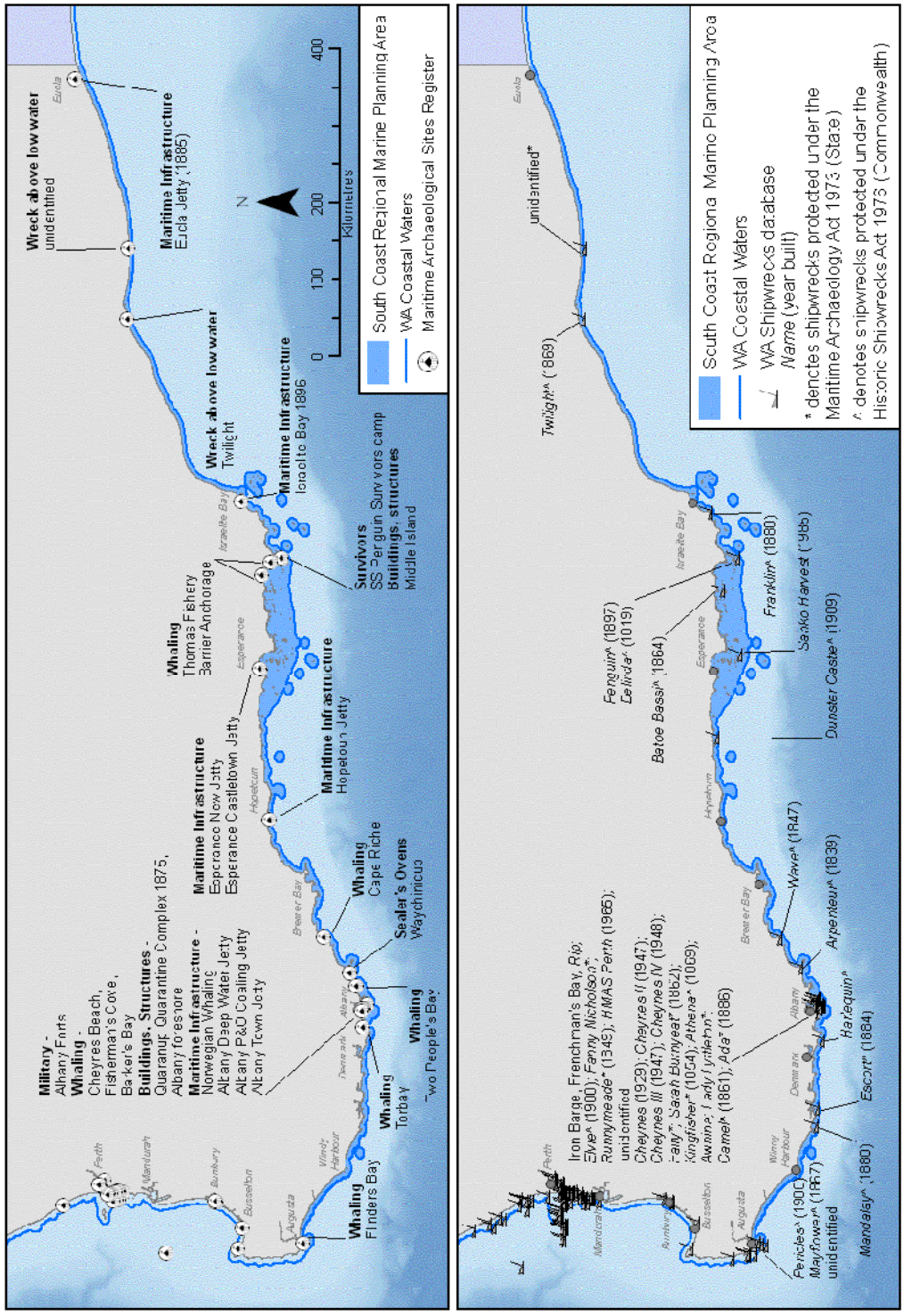


Figure 13: South coast maritime heritage

For map source information see Appendix 4

management. Many recorded wrecks are yet to be located and could be found on the seafloor or buried in coastal sand dunes.

Challenges and Opportunities

- Damage to archaeological sites through looting and development activities.
- Legislative complexity, including for protection of sites.
- Lack of knowledge of maritime heritage issues among decision makers and the broader community.
- Large numbers of sites requiring monitoring and management.
- Potential for unlocated wrecks to be discovered on the seafloor or buried in coastal dunes.
- Potential for climate change to adversely impact maritime heritage sites.
- Potential for agency field staff and others to become involved in the protection of maritime heritage.

Objectives

- To protect maritime heritage sites from intentional or unintended damage and deterioration.
- To engage Government employees and members of the public in the monitoring and management of maritime heritage sites.

No. C2.7	Proposed Strategies for Maritime Heritage	Responsibility for Initiation	Timing of Initiation
	Sustainability		
S1	Facilitate the further development and maintenance of a comprehensive database of maritime heritage sites on the south coast by the Western Australian Maritime Museum.	WAM	Underway (WAG)
S2	Provide additional educational materials and training on the maritime heritage of the south coast for key Government employees and members of the public.	WAM	Years 3-5
S3	Investigate the use of an interactive web-based application to enable field operatives to update maritime heritage databases.	WAM	Years 3-5
S4	Consider the potential impacts of climate change in all plans for maritime heritage sites.	WAM, OCC	Underway (WAG)
S5	Investigate the potential for increased use of volunteers such as divers to assist with the monitoring and management of maritime heritage sites.	WAM	Years 3-5
	Inter-sectoral coordination		
C1	Include the Western Australian Maritime Museum on State and Local Government development notification lists and databases.	WAM	Underway (WAG)
C2	Establish a Memorandum of Understanding between the Department of Environment and Conservation, the Department of Fisheries and the Western Australian Maritime Museum for the monitoring and management of maritime heritage sites by agency staff.	WAM, DEC, DoF	Years 1-2
C3	Encourage coordinated management of maritime heritage sites by State and Commonwealth authorities.	WAM	Years 3-5

C2.8 Ports and Shipping

Context

The south coast region of Western Australia is connected to the world's sea lanes through the ports of Albany and Esperance (see Figure 14). These ports are vital components of the economic and social fabric of the south coast, with imports and exports underpinning much of the economic activity in the region, not only close to the coast but also in extensive catchments and distant communities. In this

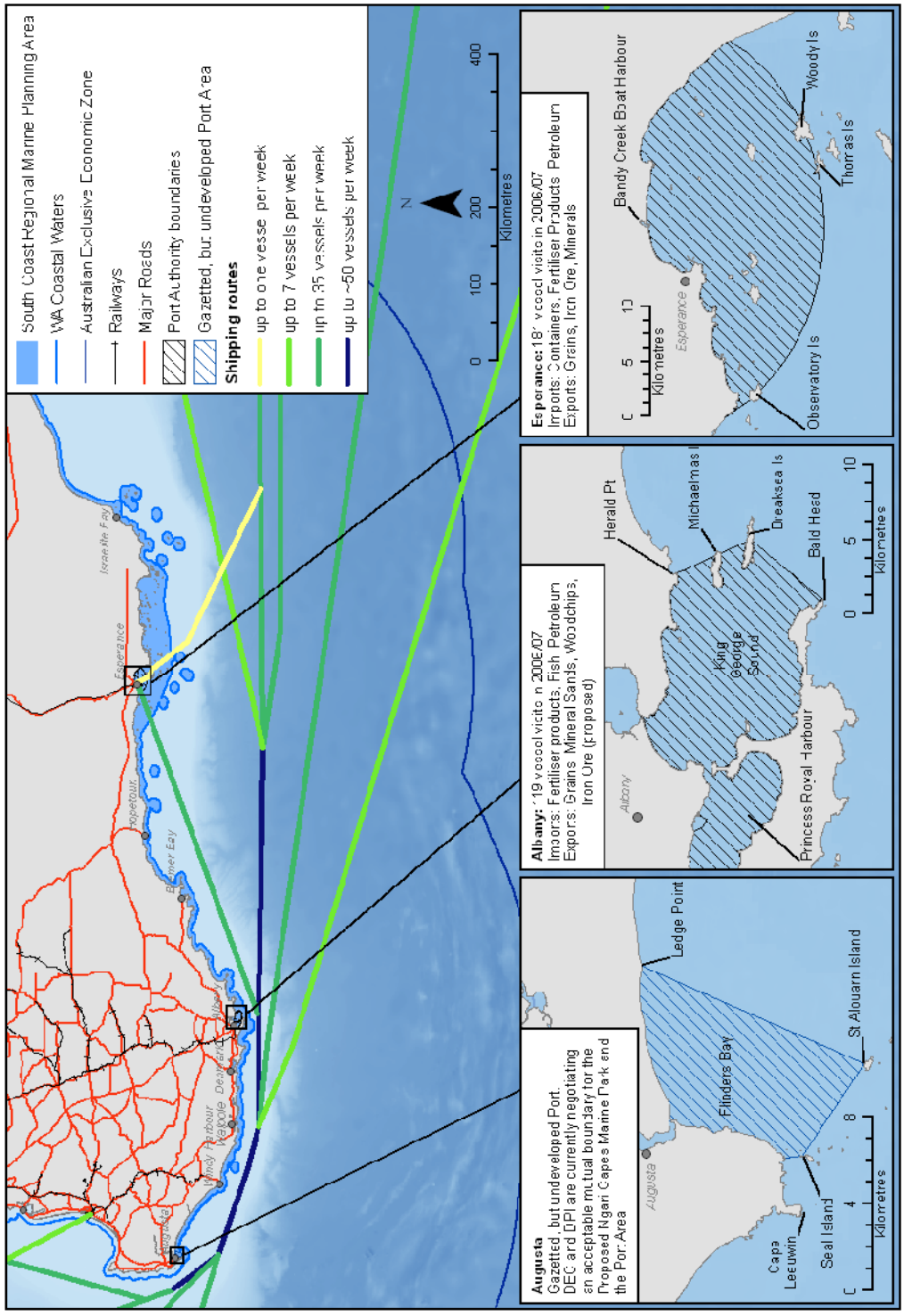


Figure 14: South coast port boundaries and shipping movements

For map source information see Appendix 4

respect, both ports are critical to the continuing economic prosperity of the regions they support, as well as to the State and national economies. Both Albany and Esperance Ports report through their individual Boards to the Minister for Transport under the terms of the *Port Authorities Act 1999*. There is also a gazetted port at Augusta, although this has not been developed.

Ports and their associated user industries are major direct and indirect employers in the region. The Port of Albany imports fuel, fish and fertiliser, with exports including grain, canola, woodchips, silica sand and timber. The main imports through the Port of Esperance for 2007/08 were petroleum, fertiliser and sulphur, while the main exports were iron-ore, nickel, grain, lupins, peas and canola.

Table 3: Albany and Esperance Port Activity

	Port of Albany 2008-09	**Port of Esperance 2007-08**
Total vessel visits	160	192
Total imports (tonnes)	144,368	706,918
Total exports (tonnes)	4,024,311	9,224,365
Agricultural exports (tonnes)	2,210,174	1,559,536
Mineral exports (tonnes)	89,650	7,664,829
Other exports including timber (tonnes)	1,724,487	-
Total revenue	$10,714,000	$40,695,000

Most freight is transported to and from the Ports of Albany and Esperance by rail, with road transport for some products. Freight routes traverse town boundaries and are becoming increasingly constrained due to limited availability of land and impacts on port communities such as noise, dust and traffic congestion. Dredging, disposal of excess dredged material, reclamation and expansions to facilitate trade and maintain competitiveness are all normal activities for both Albany and Esperance Ports. These proposals are considered through the existing Western Australian environmental approval processes and under the *Environmental Protection Act 1986* in particular. Even with expanded capacity in the existing ports, development of new port facilities on the south coast may be required in the future to meet the needs of the region. It is essential that the socio-economic and environmental value of expanding existing ports is reconciled against the higher socio-economic and environmental cost of port developments in previously undeveloped areas. Further, it is important that this fundamental recognition of the value in fully utilising existing port infrastructure is effectively communicated and understood throughout the whole of Government and in the broader community.

Both domestic and overseas ships frequent the ports of the south coast. Figure 14 indicates the main routes used by shipping off the Western Australian south coast. Shipping activity is governed by a raft of international conventions on safety and environmental protection that are implemented through State and Commonwealth laws (see *Marine Water Quality*). Resource development projects along the south coast have led to a rise in the number of ship movements required for associated imports and exports.

The location of marine protected areas in port jurisdictions and in waters adjacent to ports has the potential to limit the normal operation and requisite future growth of the ports and could have significant consequences for current and future south coast port infrastructure and the capacity of ports to cater for additional throughput.

Challenges and Opportunities

Ports

- Increasing demand for maritime transport.
- Increasing numbers and sizes of vessels.
- Balancing environmental, economic and social considerations in normal port operations.
- Management of impacts on marine water quality and habitats from port loading processes.
- Management of port-related development activities such as dredging and dredge spoil disposal which have the potential to affect the marine environment (see *Marine Water Quality*).
- Increasingly complex processes and technical requirements for environmental approvals for port expansion and operations.
- Encroachment and constraint of existing and future available land and freight routes.

- The potential for marine protected areas to constrain normal port activities.
- Constant and rapidly emerging trade opportunities which need to meet critical marketing windows.
- Strategic planning for future associated industrial areas and transport access routes.
- Urban redevelopment of industrial land, urban encroachment, changing socio-economic status and resident expectations adjacent to and near historic port sites.
- Constraints imposed on ports by commercial fishing, aquaculture and other uses.
- Meeting or exceeding increasingly complex environmental, health and safety and community expectations within existing funding frameworks.
- Consideration of social, economic and environmental costs of new ports compared to expansion of existing ports.
- Limited availability of alternative port sites on the south coast due to technical requirements such as deep and sheltered access.

Shipping

- Offers the most efficient form of global bulk material transport with the lowest carbon emissions per tonne equivalent when compared to any other transport mode.
- Potential risks to water quality from ship-sourced pollution incidents such as oil spills and operational related impacts such as product spill and the release of anti-fouling biocides (see *Marine Water Quality*).
- Potential for the introduction of exotic marine organisms from ballast water discharge and hull fouling (see *Introduced Marine Organisms*).
- Potential for increased interaction between vessels and protected species such as whales.

Objectives

- Facilitate the safe and efficient operation of ports and shipping to maximise economic and social benefits to the south coast region and the State.
- Encourage sound planning for the strategic development of critical socio-economic port infrastructure, both current and future.
- Undertake port and shipping activities in a balanced way with a high regard for social, economic and environmental values.

No. C2.8	Proposed Strategies for Ports and Shipping	Responsibility for Initiation	Timing of Initiation
	Sustainability		
S1	Prepare a 20-year plan for ports, freight access and shipping on the south coast including identifying potential new port sites for incorporation into future marine planning and reservation processes.	DoT, Port Authorities, DSD	Years 3-5
S2	Educate key stakeholders and members of the public on the socio-economic benefits derived from and significance of south coast ports.	Port Authorities, DoT	Underway (WAG)
S3	Continue to collect baseline data and develop jurisdictional understanding of port activities through continual improvement of monitoring and management practices.	Port Authorities, DoT	Underway (WAG)
S4	Undertake normal port activities in a manner that minimises the risk to surrounding communities and environments.	Port Authorities	Underway (WAG)
S5	Engage the shipping sector in planning for the management of interactions between ships and threatened species such as whales.	DoT, DEC	Years 3-5
	Inter-sectoral coordination		
C1	Engage the port and shipping sectors in planning and management of all activities and developments that may pose risks to the south coast marine environment or its users (see *Cooperation and Integration*).	ICG	Underway (WAG, Ind)

C2	Identify statutory and priority areas for existing and future ports and shipping through the proposed marine value and usage mapping process (see *Cooperation and Integration*).	Port Authorities, DoT	Underway (WAG)
C3	Encourage consideration of any new ports in town planning processes.	Port Authorities, DoT, DoP, LGA	Years 1-2
C4	Involve Port Authorities early in planning for marine conservation reserves and consider current and future port requirements in reserve design.	Port Authorities, MPRA, DEC	Years 1-2

C2.9 Marine Recreation

Context

Marine recreation is an important part of life on Western Australia's south coast. The beautiful beaches, clear waters and spectacular coastal scenery draw both residents and visitors to the coast in growing numbers. This section covers recreational activities including swimming, diving, surfing, power and sail boating, water skiing, jet skiing and general beach-going. Related topics are covered in *Recreational Fishing*, *Marine Tourism*, *Charter Boats* and *Marine Safety*.

Marine recreational activities necessitate access to the coast. The network of boat ramps, boat harbours and maritime facilities provided by the Department of Transport supports marine recreation by providing safe access to the Southern Ocean (see *Coastal Development*). Boat harbours are usually managed by the Department of Transport, with boat ramps administered by Local Authorities. Figure 19 shows the location of maritime facilities along the south coast. High usage levels of four-wheel-drives, trail bikes and all-terrain vehicles are causing problems with erosion of fragile coastal areas and with the spread of the fungal plant disease known as dieback.

Commercial marine recreational activities include surfing courses, which are run at various locations along the south coast from Walpole to Bremer Bay and around Esperance.

Results for various recreational pursuits from the Community Recreational Marine Usage Survey (see *South Coast Regional Marine Planning Process*) are summarised in Figure 15. Survey respondents were asked to rate the value of different coastal and marine activities to them, in their own marine usage and also to rate how valuable they think these activities are to the wider community. They were asked to use a number from 1 (low) to 5 (high). Table 4 shows the top 10 marine recreational pursuits ranked in order of their value to the individual respondents.

Challenges and Opportunities

- Complexity of planning for and managing the large range of marine recreational activities pursued on the south coast.
- Risks to the safety of visitors posed by the south coast's rugged coastline, wild seas and changeable weather (see *Marine Safety*).
- Responsibilities for recreation management are split across a number of Government agencies.
- Overcrowding of popular sites and areas, particularly at peak times.
- Impact of access and infrastructure on adjacent lands.
- Pressure for re-development of low-key camping areas and caravan parks on the coast.
- Provision of boat ramps concentrates recreational usage in particular areas.
- Anchoring of boats can damage fragile marine habitats.
- Changes to work and recreation patterns as a result of altered employment patterns and higher disposable incomes.
- Lack of community awareness of the impacts of recreational activities on coastal and marine environments.
- Increased community expectation for recreational opportunities and facilities.

Objectives

- To provide adequate opportunities and facilities to enable and enhance sustainable marine recreational experiences.
- To reduce potential adverse environmental and social impacts associated with marine recreation.

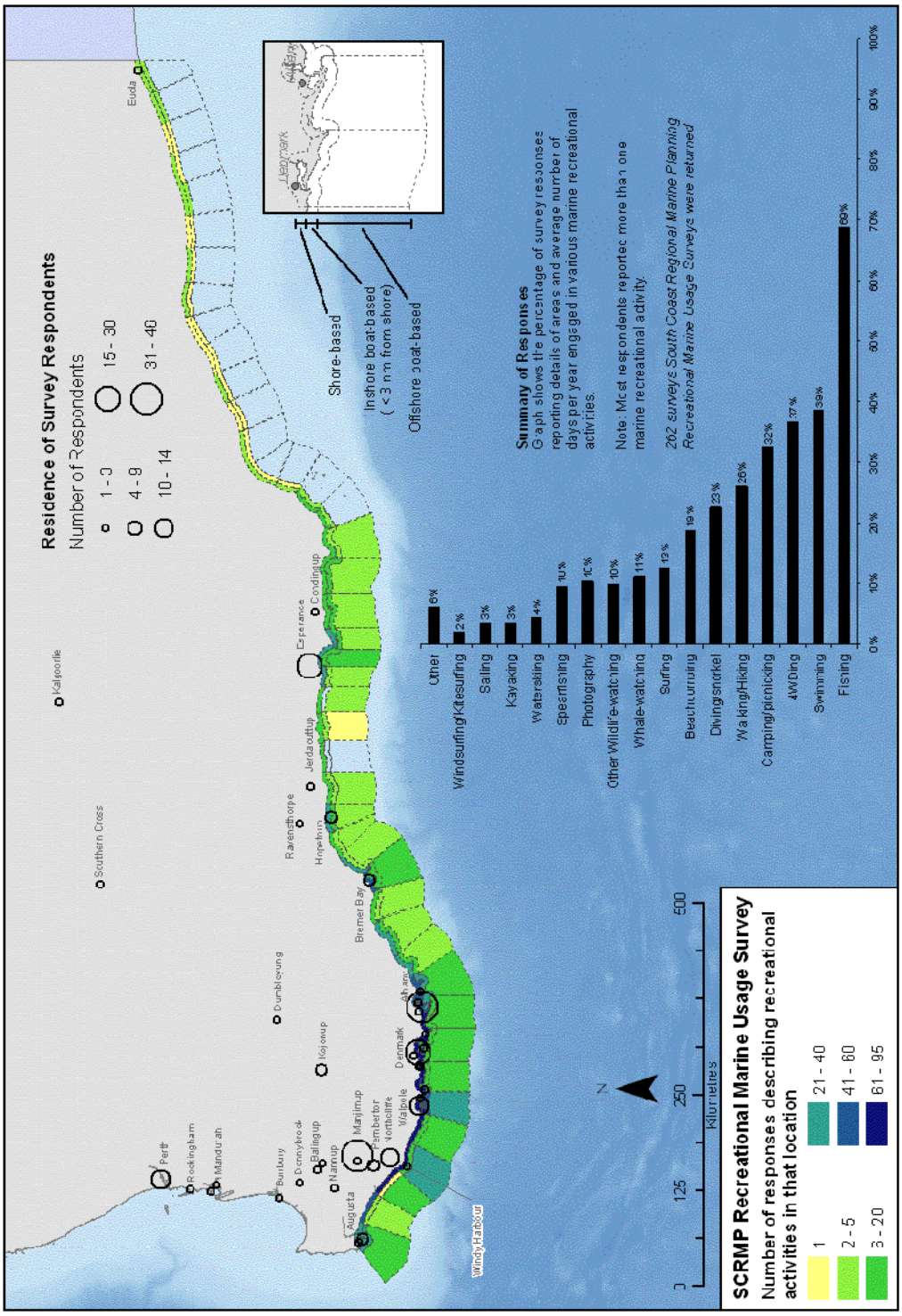


Figure 15: South coast recreational marine usage survey summary

For map source information see Appendix 4

Table 4: Responses to the recreational "values" question of the Community Recreational Marine Usage Survey

Activity	"My Value"			"Wider Value"		
262 responses in total	"Lower"		"Higher"	"Lower"		"Higher"
	0, 1 or 2	3	4 or 5	0, 1 or 2	3	4 or 5
Camping	25.6%	17.9%	56.5%	26.7%	13.7%	59.5%
Swimming	28.6%	20.2%	51.1%	25.2%	10.7%	64.1%
4WDing	39.3%	14.1%	46.6%	30.2%	20.2%	49.6%
Fishing - Shore-based	37.0%	17.2%	45.8%	23.3%	15.6%	61.1%
Walking	44.3%	14.5%	41.2%	33.6%	23.7%	42.7%
Beachcombing	43.9%	19.1%	37.0%	40.5%	23.7%	35.9%
Fishing - Inshore boat-based (< 3 nautical miles offshore)	48.5%	14.9%	36.6%	29.0%	20.6%	50.4%
Wildlife-watching	52.3%	11.8%	35.9%	43.9%	22.5%	33.6%
Fishing - Offshore boat-based (> 3 nautical miles offshore)	61.5%	8.8%	29.8%	42.7%	24.0%	33.2%
Dive - Shore	59.2%	13.0%	27.9%	46.2%	22.9%	30.9%

No. C2.9	Proposed Strategies for Marine Recreation	Responsibility for Initiation	Timing of Initiation
	Sustainability		
S1	Continue to raise awareness of the safety implications of environmental extremes specific to the south coast.	ICG	Underway (WAG)
S2	Ensure continuing engagement of recreational users in planning and management of marine recreational activities and facilities.	ICG, NRMG	Underway (WAG)
S3	Consider the potential influences on recreational use patterns when planning for development of coastal infrastructure.	ICG	Years 1-2
S4	Encourage the retention of family-oriented coastal accommodation, recreational facilities and opportunities.	ICG	Years 3-5
S5	Encourage, where appropriate, the development of high quality, low impact coastal accommodation and other facilities.	TWA, DoP	Years 3-5
S6	Provide adequate permanent moorings in areas of high small boat usage.	DoT, DEC	Years 3-5
S7	Encourage the further development of and adherence to codes of conduct to reduce impacts of recreation on the environment and other users.	DEC, DoF, NRMG	Underway (WAG)
S8	Expand educational programs to encourage environmentally and socially responsible marine recreational use.	ICG, NRMG	Years 1-2
S9	Research and monitor trends in coastal and marine recreation and develop and refine planning and management approaches in response to the findings.	DoT, DoP, DEC, DoF	Underway (WAG)
S10	Plan for spatial and/ or temporal separation of incompatible recreational activities.	ICG	Underway (WAG)
	Inter-sectoral coordination		
C1	Identify priority areas for a range of marine recreational activities through the proposed marine value and usage mapping process (see *Cooperation and Integration*).	ICG	Underway (WAG)

C2	Engage recreational users in planning and management of all activities and developments likely to impact on the south coast marine environment or its users (see *Cooperation and Integration*).	ICG, NRMG	Years 1-2

C2.10 Marine Tourism

Context

Marine tourism is one of the fastest growing tourism sectors world-wide. This section covers a range of marine activities and experiences including diving, surfing, sailing, island visits, windsurfing, beach-going and visits by cruise ships (see Figure 16). Also covered are accommodation and other tourist support sectors. Charter operations are covered in *Charter Boats*.

Tourism Western Australia is the State Government agency whose primary responsibility is to develop, promote and protect Western Australia's iconic tourism experiences, including those in the marine environment. The tourism region known as Australia's South West covers the coastline between Augusta and Bremer Bay. Esperance, which also forms part of the south coast Regional Marine Planning area, is located within Australia's Golden Outback tourism region.

The south coast of Western Australia offers much to the marine tourist. A mild climate, unspoiled white sand beaches, spectacular coastal scenery and wonderful wildlife viewing and water sport opportunities combine to make this region a popular holiday and recreational destination. Tourism is a major industry in Australia's South West Region and the Esperance area, with visitation approaching two million and estimated to contribute in excess of $900 million to regional economies in 2008-09.

Figure 16 indicates the levels of marine tourism in the planning area. No specific data on marine tourism expenditure are kept, however Tourism Western Australia research indicates that the average expenditure per visit by tourists in the South West Tourism Region in 2008-09 was approximately $459 for domestic visitors and $858 for international visitors. In the three years ending in June 2007, the equivalent average expenditures per visit in the Shire of Esperance were $374 and $214 per visit respectively. Research by Tourism Western Australia indicates that in 2008-09, 37% of domestic visitors to Australia's South West went to the beach and 11% went fishing. Tour operators, accommodation and food outlets, as well as the broader retail sector, all benefit from expenditure by the tourism sector.

Coastal towns along the south coast each play host to a "catchment" of inland visitors who head for the coast during holiday periods. Peak visitor levels cause some overcrowding at key access points along the coast, including Augusta, Windy Harbour, Walpole, Denmark, the City of Albany, Bremer Bay, Hopetoun and Esperance.

The network of boat ramps, boat harbours and maritime facilities provided by the Department of Transport supports marine tourism by providing safe access to the Southern Ocean (see *Coastal Development*). Boat harbours are usually managed by the Department of Transport, with boat ramps administered by Local Authorities. Figure 19 shows the location of maritime facilities along the south coast. Dive tourism is increasingly popular along the south coast. In particular, the wreck of the HMAS *Perth* in King George Sound in Albany and the *Sanko Harvest* off Esperance draw many dive tourists.

The ports of Albany and Esperance provide essential infrastructure to the marine tourism industry. Albany received 12 cruise ship visits during the 2008/09 season and this number is expected to increase as cruise ships continue to look to Australia and Western Australia for new and different destinations for their passengers. Cruise ship passengers and crew have the capacity to inject significant contributions into regional economies, especially in the retail sector.

Challenges and Opportunities

- Balancing the provision of tourism opportunities with the need to protect and manage the underlying resource.

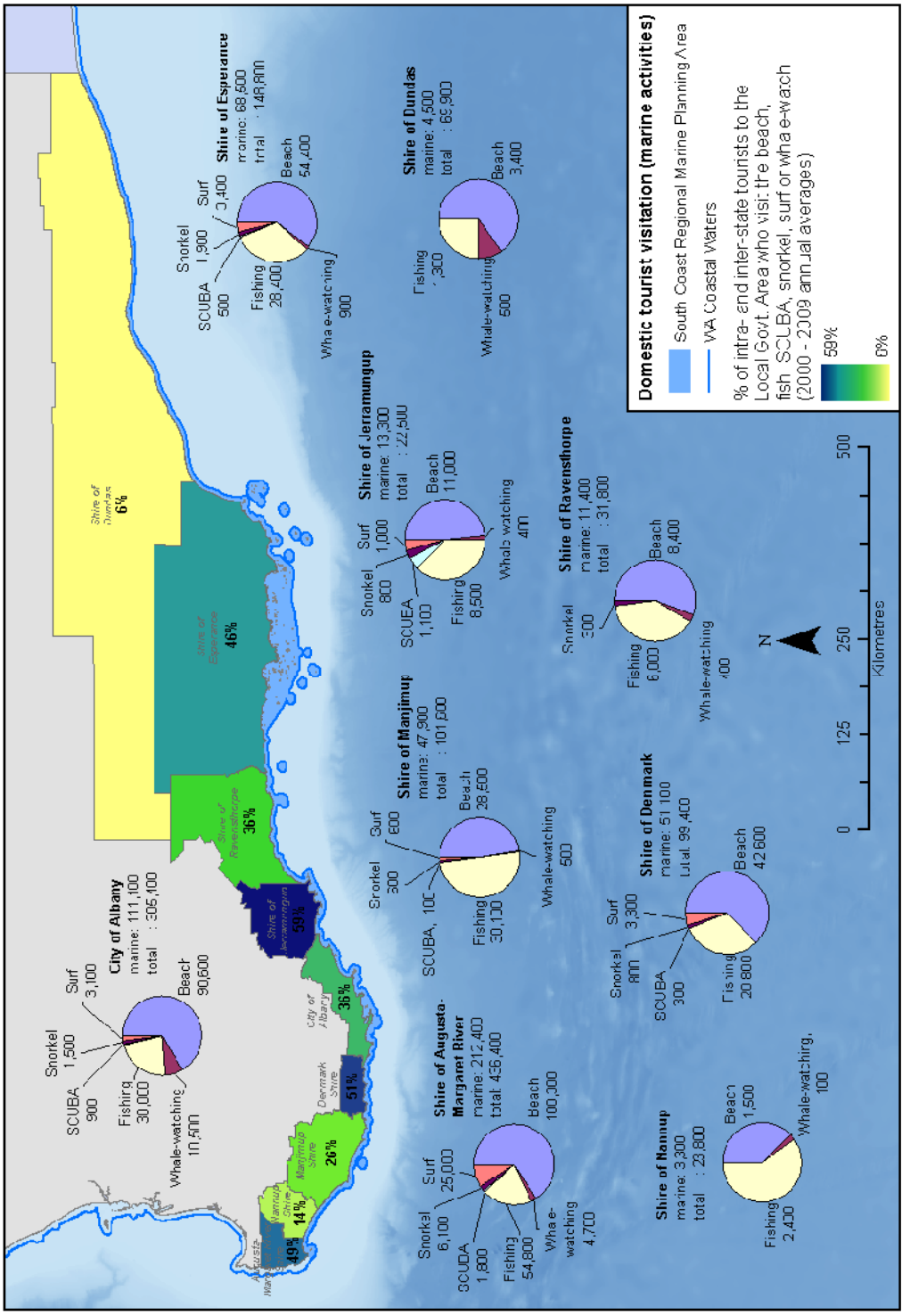


Figure 16: Marine tourism on the south coast

For map source information see Appendix 4

- Provision of infrastructure to match growing tourist numbers.
- Anticipating future activities and needs.
- Difficulty of regulating individual users.
- Management of tourist interactions with wildlife, natural environments and existing uses such as shipping and port operations.
- Visitor safety (see *Marine Safety*).
- Attractiveness of Western Australia's south coast marine environment as a tourist destination.
- Increasing popularity of nature-based tourism experiences world-wide.
- Opportunities for the development of island-based tourism on the south coast.
- Provision of a range of quality, sustainable tourism experiences to suit all requirements.

Objectives
- To provide a safe and sustainable, quality experience for tourists.
- To increase benefits to the economy and to consumers from a sustainable marine tourism sector.

No. C2.10	Proposed Strategies for Marine Tourism	Responsibility for Initiation	Timing of Initiation
	Sustainability		
S1	Encourage, where appropriate, the provision of a range of sustainable marine tourism experiences and activities.	TWA, DEC, DoF	Underway (WAG, Ind)
S2	Educate visitors in low-impact tourism through the development of suitable information programs.	ICG	Years 1-2
S3	Continue to monitor and manage the impacts of tourism on the marine environment.	ICG	Underway (WAG, Ind)
	Inter-sectoral coordination		
C1	Engage the marine tourism sector in planning and management of all activities and developments likely to impact on the south coast marine environment or its users (see *Cooperation and Integration*).	ICG	Underway (WAG, Ind)
C2	Identify priority areas for marine tourism through the proposed marine value and usage mapping process (see *Cooperation and Integration*).	TWA	Underway (WAG, Ind)
C3	Plan collaboratively between service providers and Government to provide quality, sustainable tourism experiences now and in the future.	ICG	Years 3-5
C4	Plan on a whole-of-Government basis for necessary coastal infrastructure to support tourism.	ICG	Years 3-5

C2.11 Charter Boats

Context
Charter boats along the south coast offer a range of non-extractive opportunities including whale watching and other wildlife observation, diving, snorkelling, sightseeing and private functions (see Figure 17). Fishing charters are the main extractive activities.

Other non-charter, boat-based marine tourism activities are covered in *Marine Tourism*. Different charter boat operations are licenced by different Government departments:

Type of Charter Operation	Licensing Agency
Commercial activities in marine parks or reserves	DEC
Operations with the potential to impact on fish stocks or the aquatic environment	DoF
Operations with the potential to disturb marine flora or habitats	DEC
Operations involving interaction with marine mammals, birds or reptiles	DEC
Marine safety – all charter vessels must be surveyed	DoT
Coastal infrastructure – all operators	DoT

Fishing charters licenced by the Department of Fisheries are required to prepare records of catch and other data on a trip by trip basis and submit that data at the end of each month. Information collected forms part of the Department's catch and effort estimates.

Whale watching charters operate from Augusta, Albany and Esperance, with southern right whales and humpback whales being the most commonly observed species. Dolphin watching tours are available in Augusta. Charters also provide wilderness and wildlife experiences, visiting islands to view seals, sealions, seabirds and heritage sites. Diving charters focussing on local reefs and wrecks run from Albany, Bremer Bay and Esperance and sight-seeing charters based on coastal scenery, islands, harbours and estuaries are available in most south coast towns.

The Department of Environment and Conservation provides a Tour Operator's Handbook for commercial operators entering lands and waters managed by the Department. The handbook details operational licence conditions and other essential information. All operators licensed by the Department are required to complete an Online Tour Operator Education Program. Direct interactions between charter patrons, vessels and wildlife are carefully managed under the provisions of the *Wildlife Conservation Act 1950*.

The network of boat ramps, boat harbours and maritime facilities provided by the Department of Transport supports charter boats by providing safe access to the Southern Ocean (see *Coastal Development*). Boat Harbours are usually managed by the Department of Transport with boat ramps administered by Local Authorities. Figure 19 shows the location of maritime facilities along the south coast.

The Tourism Council Western Australia is responsible for administering the National Tourism Accreditation Program in Western Australia. This program is designed to ensure that all tour operators meet accepted industry standards for a tourism business. Accreditation does not involve specific requirements for charter boat tour operations, but modules can be developed if deemed necessary. Another eco-certification program is provided by Ecotourism Australia, which also encourages a sustainable tourism industry and quality assurances to consumers seeking a nature-based tourism experience.

The Department of Transport has the legislative responsibility for survey and certification of charter boats and for the qualifications of operators and crews and is the designated hazard management agency for marine oil spills. The Department actively promotes the use of the *Ferry and Charter Boat Industry Code of Practice* and its underlying safety management systems, which are audited by marine safety officials. It is intended that the use of the Code and Safety Management Systems will be a requirement for tourism accreditation. A user-pays approach exists for the provision of coastal infrastructure (see *Coastal Development*).

Challenges and Opportunities

- The current regulation system is complex, involving a number of Government agencies.
- The welfare of wildlife needs to be protected while providing a quality experience for patrons.
- Charter boat licence numbers are only capped in some instances, though demand is growing.
- There is spare capacity in the charter fishing sector, meaning impacts could increase without the need for increased numbers of operators.
- There is considerable potential for expansion of the charter boat sector along the south coast.
- Provision of adequate shore-based infrastructure for charter boats, especially jetty facilities for whale and dolphin cruises (see also *Coastal Development*).

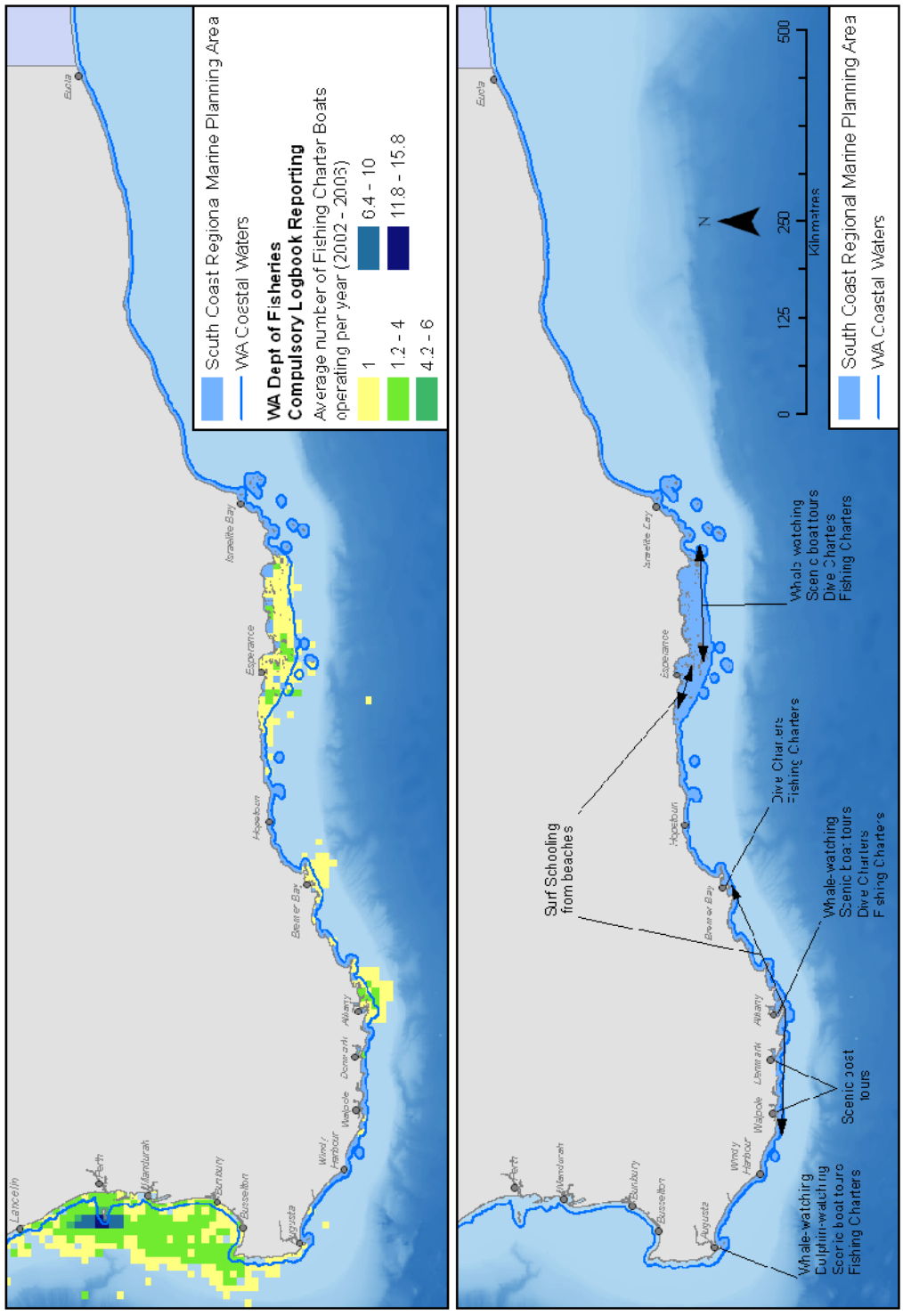


Figure 17: Commercial marine recreation activities

For map source information see Appendix 4

- Charter boat operators can assist in educating patrons about sustainable marine recreation.

Objectives
- To provide a safe, quality, sustainable experience for charter boat patrons.
- To gain benefits to the economy and to consumers from a sustainable charter boat sector.
- To reduce adverse impacts from charter boat operations on marine animals, plants, fish resources and ecosystems.

No. C2.11	Proposed Strategies for Charter Boats	Responsibility for Initiation	Timing of Initiation
	Sustainability		
S1	Continue to monitor and manage impacts and operator compliance with regulations.	DEC, DoF	Underway (WAG, Ind)
S2	Monitor and manage customer satisfaction and safety.	TWA, Industry bodies	Underway (WAG, Ind)
S3	Develop and distribute additional information packages for charter boat operators and crew.	ICG, Industry bodies	Years 3-5
S4	Contribute, with the charter industry, to development and implementation of an accreditation system for all operators.	TWA, Industry bodies	Years 3-5
S5	Promote the ecologically sustainable credentials of charter boat operations on the south coast to potential customers.	TWA, Industry bodies	Years 3-5
	Inter-sectoral coordination		
C1	Establish a multi-agency coordination group for the south coast to work with charter boat operators to ensure effective management of their operations.	ICG	Years 1-2
C2	Identify priority areas for charter boat operations through the proposed marine value and usage mapping process (see *Cooperation and Integration*).	ICG	Underway (WAG, Ind)
C3	Engage the charter boat sector in planning and management of all activities and developments likely to impact on the south coast marine environment or its users (see *Cooperation and Integration*).	ICG	Underway (WAG, Ind)
C4	Encourage consideration of the designation of a lead Government agency for charter boat management.	ICG	Years 3-5
C5	Plan for necessary coastal infrastructure for charter boats on a cross-sectoral basis.	ICG, LGA	Years 3-5

C2.12 Resource Development

Context
Mineral and petroleum (oil and natural gas) resource development is an active sector on the south coast. A number of operating and prospective mining and quarrying ventures are located along the south coast (see Figure 18), many of which supply construction materials for use in maintaining roads and other community and social infrastructure. No seafloor mining is occurring or planned along the south coast at present (2010). Petroleum exploration areas are located offshore in Commonwealth waters between Albany and Esperance (see Figure 18). There is a risk that these operations may have impacts on the marine environment, though they also contribute important information on the biological and physical character in the area of operation. Also, resource developments in this region can contribute to the economy and society, thus contributing to the sustainability of communities.

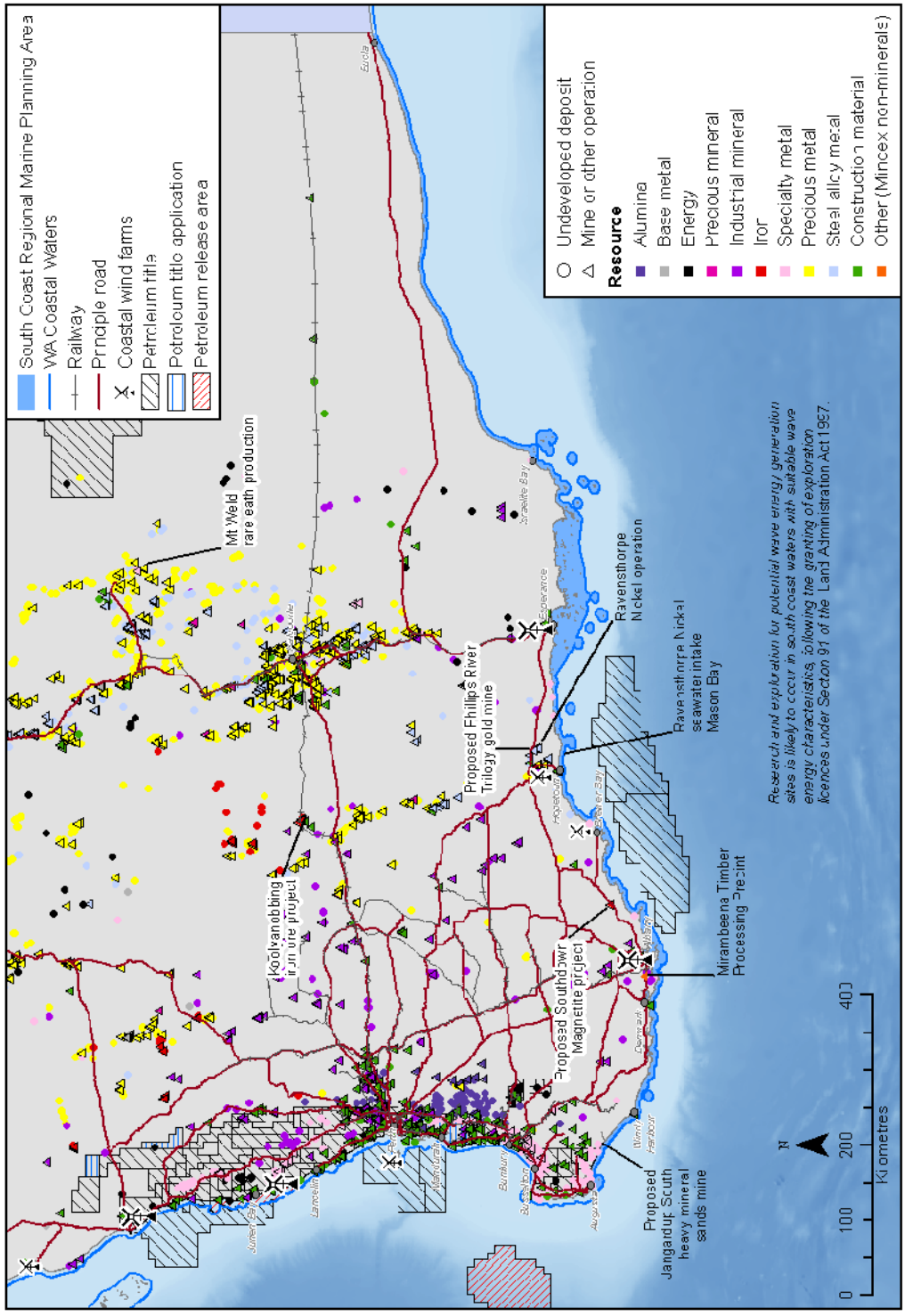


Figure 18: Resource development and renewable energy

For map resource information, see Appendix 4

Most mineral products are railed to ports for export to locations within Australia and overseas, usually for processing. Mine infrastructure includes railways, roads, powerlines and pipelines. These and other development activities, especially within catchments, can have direct impacts on the marine environment. Increased residential workforces can increase urban development and recreational use along with associated risks to the marine environment (see also *Coastal Development*; *Recreational Fishing*; and *Recreation*).

Prospective petroleum areas have been identified in the Bremer Sub-Basin off the Western Australian south coast between Albany and Esperance and inland between Flinders Bay and Geographe Bay. There are two Bremer Sub-Basin exploration licences administered by the Australian Government and several exploration licences in the Flinders Bay region administered by the State (see Figure 18). Some seismic exploration has been conducted and a small number of exploratory holes have been drilled in these areas, but they are yet to be fully explored to prove production capacity. It is expected that the demand for oil and gas will continue until alternative energy is commercially available and thus there is a need for a continued Australia-wide approach to petroleum exploration.

The Bremer Sub-Basin exploration lease areas are in Commonwealth waters, but seismic exploration vessels and related services use the Albany Port which lies within State waters. Should the project proceed to full production, infrastructure may need to traverse State waters and could involve associated land-based infrastructure to support offshore facilities such as production platforms. Further prospective areas for oil and gas may also be identified in the future.

Bioprospecting, which involves the search for biologically active compounds in terrestrial and marine organisms, has generated increasing demand, from both research and commercial organisations, for access to Australia's biological resources. These activities may lead to the development of new and significant human and veterinary pharmaceuticals and agrochemicals, as well as fostering developments in relation to taxonomy and the documentation of the State's biodiversity. The Department of Fisheries develops and implements management arrangements in relation to bioprospecting activities within Western Australia's marine environment.

Bioprospecting may provide a number of socio-economic benefits: the development of new pharmaceuticals and food stuffs from native biota; the licensing of intellectual property rights; and development of new value-adding resource-based industries. Bioprospecting may also lead to enhanced scientific knowledge and research capacity and the training of scientists.

Other resource development projects such as in timber and energy production may affect marine environments and marine users. As in the case of mineral resources, their key impacts occur in catchments and in areas such as transport nodes which are spatially confined and managed.

Environmental approvals for resource development projects include commitments by the companies to fulfil the conditions imposed under the Environmental Protection Act, Mining Act and the petroleum Acts. Conditions of approval can be wide ranging and include penalties and (under the *Mining Act*) environmental performance bonds. The mineral and petroleum production sector has developed sophisticated land management and rehabilitation techniques, which are recognised as being world class and has also developed eco-efficiency in mineral processing.

Access to mineral and petroleum resources, resource production and processing, transport, and access to water and energy are all key issues for the resource development sector. As mineral resources make significant contributions to local, State and national economies, it is important that these activities and services are facilitated appropriately in the south coast marine region. In addition, the potential for processing and value adding to the resources within the south coast should be considered as diversifying and expanding its economic, commercial and employment opportunities.

Some of the key social issues addressed in resource development projects include the accommodation of the workforce, promotion of commercial diversity and the support for local community employment and training. The State is supportive of residential workforces because of the socio-economic benefits accruing to local communities.

The resource development sector is engaged with local communities; employment and training of Aboriginal people; and adding value to public assets such as roads, housing, water supply, sewerage systems and community facilities.

Project Approvals
Assessments of proposed mineral resource developments are conducted under the provisions of the *Environmental Protection Act 1986, Conservation and Land Management Act 1984, Wildlife Protection Act 1950, Mining Act 1976* and, where appropriate, the *Petroleum Pipelines Act 1969* and the *Petroleum (Submerged Lands) Act 1982.* Assessments may also be required under the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* for proposed projects that affect matters of national environmental significance. All these statutes provide stringent conditions of approval which are monitored and audited.

Comprehensive environmental and social data are collected by proponents of complex project proposals for assessment by the Environmental Protection Authority and the Department of Mines and Petroleum before approvals can be granted. Impacts on the marine environment and marine users are evaluated in these processes.

Challenges and Opportunities
- Ensuring access to resources with minimal impact on environmental values.
- Minimising impacts of mineral and petroleum exploration and production on marine life and ecosystems.
- Reducing risks to the environment and marine-related activities.
- Accommodation of residential workforces.
- Planning for climate change impacts on resource projects and support infrastructure such as ports.
- Benefits of economic diversification to the region.
- Potential employment and social benefits.
- Enhancement of environmental data and knowledge through the requirements of environmental approvals processes for resource projects.
- Opportunities for contributions to marine research, monitoring and management through resource industry stewardship programs.

Objectives
- To improve the long term sustainability of south coast communities and economies through resource development.
- To increase support for resource developments from marine stakeholders and members of the public on the basis of their acceptability on environmental, social and cultural and economic grounds.

No. C2.12	Proposed Strategies for Resource Development	Responsibility for Initiation	Timing of Initiation
	Sustainability		
S1	Enhance opportunities for collaborative engagement of marine stakeholders and members of the public in the assessment and ongoing management of resource development projects.	ICG	Years 1-2
S2	Seek access to data collected by the resource sector for inclusion in databases used in marine planning and management.	ICG	Underway (WAG, Ind)
S3	Continue to foster strategic environmental, economic and social assessment of all proposed resource development projects.	ICG, NRMG	Underway (WAG, Ind)
S4	Continue to monitor and manage the marine risks of resource development projects.	DMP, DSD, DEC, EPA	Underway (WAG, Ind)

S5	Encourage innovation in environmental best practice and promote continuous improvements.	DMP, DSD, DEC	Underway (WAG, Ind)
S6	Provide feedback to marine stakeholders and members of the public on the management and performance of resource development projects.	ICG	Years 3-5
S7	Encourage research into the marine aspects of best practice in resource development projects, implement findings and communicate the results to marine stakeholders and members of the public.	ICG	Years 3-5
S8	Plan for the potential risks of climate change on resource development projects.	ICG, OCC	Years 3-5
S9	Identify situations where resource development activities can co-exist with the marine parks and reserves system.	MPRA, DEC, DMP, DSD	Years 3-5
S10	Encourage the further development of employment and training programs for the resource development sector.	DMP, DSD, Development Commissions	Underway (WAG, Ind)
	Inter-sectoral coordination		
C1	Identify priority areas for resource development through the proposed marine value and usage mapping process (see *Cooperation and Integration*).	ICG	Underway (WAG, Ind)
C2	Engage the resource sector in planning and management of all activities and developments likely to impact on the south coast marine environment or its users (see *Cooperation and Integration*).	ICG	Underway (WAG, Ind)
C3	Ensure integrated planning for marine-based infrastructure along the south coast (see also *Marine Aquaculture* and *Renewable Energy*).	ICG	Years 1-2

C2.13 Military Use

Context

There is an extensive military history associated with the south coast region. Albany Port was the last Australian landfall for Gallipoli-bound troops in World War I, with troop ships anchoring in Princess Royal Harbour and King George Sound in November 1914. Albany has strong ANZAC Day connections as the site of Australia's first Dawn Service. Turn-of-the-century forts cover the approaches to Albany, offering a reminder that the region has been identified as a potential military target in the past.

Today, the waters of the region are used for navel exercises. The marine canyons to the south of Albany are used for submarine exercises and navigation practice and a navy submarine mooring buoy is located in King George Sound within Albany Port waters. Both Albany and Esperance Ports are used for Navy "rest and recreation" visits by Australian and foreign navy vessels.

There are no permanent military ranges or live firing areas designated in the region, however, "one off" beach landings, patrol exercises and adventure training is held in coastal areas, usually in Crown land or reserves. There are Reserve and Cadet units in Albany and Esperance.

The Royal Australian Air Force conducts pilot flight training from the Albany Airport.

Challenges and Opportunities

- The details of military exercises are necessarily confidential.
- Potential impacts of military exercises on other marine sectors.
- Sonar and other impacts on marine wildlife and environments.
- The region has a rich and interesting military history.

Objective

- To facilitate military use where it impacts minimally on the south coast marine environment and other marine uses.

No. C2.13	Proposed Strategies for Military Use	Responsibility for Initiation	Timing of Initiation
	Sustainability		
S1	Inform users of the south coast marine environment of the importance of the south coast region for military exercises.	ICG	Years 3-5
S2	Advise the Australian Defence Force of any known or suspected environmental impacts of their activities.	ICG	Underway (WAG, AG)
S3	Encourage the further promotion of the rich military history of the south coast region.	WAM	Underway (WAG, AG)
	Inter-sectoral coordination		
C1	Facilitate the use of the south coast region for military exercises.	ICG	Underway (WAG, AG)
C2	Maintain two-way communication with representatives of the Australian Defence Force regarding the minimisation of environmental impacts and integration of their activities with other uses of the marine environment.	ICG	Underway (WAG, AG)

C2.14 Renewable Energy

Context

Energy is essential for economic and community growth. The south coast marine environment has the potential to provide a range of renewable energy sources including wave energy, tidal power and wind turbines. This is because it is a high energy coast with consistent wind and wave regimes.

Current renewable energy facilities include wind turbines at Albany, Bremer Bay, Hopetoun and Esperance. The Albany and Esperance wind farms have become popular tourist attractions. Additional coastal wind turbines are under consideration at a number of other locations along the coast, including Denmark and Walpole.

Renewable energy facilities may be located in deeper offshore areas and are not restricted to coastal and nearshore areas. Examples include offshore wind farms and floating wind turbines anchored to the seabed. Although these do not currently exist in Australia, the technology is globally available and there may be potential for their use in Australia in the future. Wave-power technology has been successfully trialled in Fremantle and a number of wave energy companies have interests in potential developments in Western Australia.

Bioenergy projects may also be viable in the region and other renewable energy proposals may be considered in the future.

The expansion of the national Mandatory Renewable Energy Target Scheme to achieve 20% by 2020 will be a major driver of investment over the next few years. Western Australia has excellent renewable energy resources and the State's south coast is expected to be a competitive location for new renewable energy projects. While renewable energy sources are encouraged by the Western Australian Government and the community, the location of these facilities (particularly wind turbines) can cause concern among the local community and conservation interest groups. Thus, it is important to ensure that there is full assessment of proposed renewable energy sites within the south coast region.

Challenges and Opportunities

- Visual impacts of renewable energy developments close to the coast.
- Difficulty of predicting impacts of new renewable energy projects on the south coast.
- Potential implications for existing marine uses.
- Potential for disruption to the seabed, entanglement of marine mammals in anchors, impacts on bird and whale migration and other impacts on the marine environment.
- Need for cables from offshore renewable energy facilities to bring power to the shore.
- Potential for new environmentally sensitive socio-economic opportunities in the region such as industry development, new jobs and job diversity.
- Potential flow-on benefits from renewable energy projects (such as tourism at the Albany wind farm).
- Opportunities for the south coast to contribute to the State's renewable energy targets.
- Opportunity to reduce pollution and greenhouse gas emissions.
- Assistance in achieving land use objectives, such as reduction of soil salinity, land degradation and nutrient loading into coastal waters, through trees planted for bioenergy projects.
- More economical power sources once carbon trading is in operation.
- Potential to improve local power supply to areas which are off the main grid or remote.
- Potential for renewable energy marine infrastructure to be used in the creation of Fish Aggregating Devices and other new habitats.

Objective

- To integrate sustainable renewable energy developments with existing marine uses of the south coast.

No. C2.14	Proposed Strategies for Renewable Energy	Responsibility for Initiation	Timing of Initiation
	Sustainability		
S1	Utilise experience in other marine locations in assessing renewable energy proposals for the south coast.	ICG	Years 1-2
S2	Encourage planning of renewable energy developments in conjunction with marine stakeholders and members of the public in a manner which maximises benefits to local communities while minimising adverse environmental and other impacts.	ICG, DoP	Underway (WAG, Ind)
S3	Monitor and manage the impacts of renewable energy developments on the environment and on other marine sectors.	ICG, EPA	Underway (WAG, Ind)
S4	Support the creation of a south coast wind atlas showing feasible regional locations for wind farms both on the coast and inland.	DoP, OCC, SEDO	Years 3-5
S5	Continue to provide educational programs on the costs and benefits of renewable energy projects.	ICG, SEDO	Underway (WAG)
S6	Plan for the potential impacts of climate change on renewable energy projects.	ICG, OCC	Years 3-5
	Inter-sectoral coordination		
C1	Identify priority areas for renewable energy developments through the proposed marine value and usage mapping process (see *Cooperation and Integration*).	ICG	Underway (WAG, Ind)
C2	Engage the renewable energy sector in planning and management of all activities and developments likely to impact on the south coast marine environment or its users (see *Cooperation and Integration*).	ICG	Underway (WAG, Ind)
C3	Ensure integrated planning for marine-based infrastructure along the south coast (see also *Marine Aquaculture* and *Resource Development*).	ICG	Years 1-2

C2.15 Other Marine Uses

Context
This section covers potential new uses of the south coast marine environment, such as desalination.

Desalination plants are under consideration for several locations along the south coast. Issues such as intake and processing infrastructure and disposal of high-salinity wastewater will need to be considered in assessing the potential impacts of such proposals on the marine environment. Carbon capture and storage in under-sea environments (see *Climate Change*) may also be considered for the south coast in the future.

Other new uses of the south coast marine environment will inevitably be proposed during the life of this strategic framework. Proposed new uses should be assessed on the basis of their potential impacts on the marine environment and on other uses.

Challenges and Opportunities
- Difficulty of predicting impacts of uses not yet occurring.
- New uses of the south coast marine region can bring new economic, social and environmental opportunities to the region.
- Coordination of responses to development proposals.

Objective
- To integrate planning and management of new and existing marine uses.

No. C2.15	Proposed Strategies for Other Marine Uses	Responsibility for Initiation	Timing of Initiation
	Sustainability		
S1	Plan new marine uses in conjunction with marine stakeholders and members of the public in a manner which maximises benefits to local communities while minimising adverse environmental and other impacts.	ICG	Underway (WAG)
S2	Monitor and manage the impacts of all marine users on the environment and on other marine sectors.	ICG	Underway (WAG)
S3	Utilise experience in other marine locations in assessing proposals for the south coast.	ICG	Years 3-5
S4	Monitor global trends in new marine uses to assist with predictions of likely proposals on the south coast.	ICG	Years 3-5
	Inter-sectoral coordination		
C1	Ensure cross-sectoral consideration of any proposals for new marine uses.	ICG	Years 1-2

C2.16 Marine Safety

Context
The south coast of Western Australia presents many dangers to people working and pursuing recreational activities on the water and along the coast. Sudden storms, high winds and swells, wave surges, rips, steep rocky shores and dangerous cliffs cause accidents or deaths on the south coast every year.

The safety of both domestic and international visitors to Western Australia is of paramount concern. Australia is generally considered a relatively safe destination by world standards. However, we do have beach, road, bush and outback environments that can provide risks to the unwary. In 2001, all State and Territory Tourism Ministers endorsed the formation of a National Visitor Safety Program to improve the safety of international visitors to Australia and thus reduce the incidence of death and injury. The program involves a two-pronged approach, including direct education of international

visitors on safety issues and the education of tourism operators about visitor safety and their responsibilities.

Safety signage has been installed in coastal national parks and other popular recreational locations along the coast. Other safety approaches such as the "silent sentry" system (which holds a flotation device for release into the water) are also being trialled to reduce drownings along the rocky shore. Statistics from Royal Life Saving indicate a total of 41 drownings in the Goldfields, Great Southern and South West regions of Western Australia between 2003 and 2008. Over one third of those who drowned were fishing at the time.

The Western Australian Police (including the Water Police), the Fire and Emergency Services Authority and the Nathan Drew Memorial Trust, which is dedicated to coastal safety, are all active in coastal and marine safety initiatives on the south coast. The Western Australian emergency management committee system is based on a three tier structure at the State, district and local level and may be called on to coordinate local and regional support for marine emergencies. At a Statewide level, the State Emergency Management Committee is chaired by the Commissioner of Police as State Emergency Coordinator, with the Chief Executive Officer of the Fire and Emergency Services Authority as Deputy Chair. District Emergency Management Committees are based on emergency management districts and chaired by Police District Officers as District Emergency Coordinators, with a Regional Director of the Fire and Emergency Services Authority as Deputy Chair.

At a local level are the Local Emergency Management Committees based on either Local Government boundaries or emergency management sub-districts. These Committees are chaired by the Mayor or Shire President (or a delegated person) with the Local Emergency Coordinator, whose jurisdiction covers the Local Government area concerned, as the Deputy Chair. Local Emergency Management Committees comprise those agencies which have specific emergency management responsibilities or expertise which is essential to developing emergency management arrangements, including for marine emergencies.

Sea Rescue groups based in Esperance, Hopetoun, Bremer Bay, Albany, Denmark, Peaceful Bay, Walpole, Windy Harbour and Augusta (see Figure 19) conduct sea search and rescue operations and promote maritime safety. One hundred and twenty one search and rescue operations were mounted on the south coast in 2006/07.

Surf Life Saving Australia coordinates a national "CoastSafe" program and operates drowning prevention and emergency response services from three volunteer lifesaving clubs on the south coast. These are located at Esperance (Twilight Beach), Albany (Middleton Beach) and Denmark (Ocean Beach). These clubs provide weekend and public holiday surveillance over summer (December to March). In addition, the Australian Lifeguard Service operates in Albany and Denmark from Monday to Friday from late December to early February. In 2006/07, 17 rescues were conducted on south coast beaches by these organisations.

The Department of Transport is responsible for all boating safety in Western Australia including safety equipment compliance, marking of navigation hazards and channels, preparation of nautical charts and investigation of and prosecution relating to boating incidents and accidents. Shipping incidents offshore can have safety implications in State waters. Skippers of recreational boats are now required to obtain a Recreational Skipper's Ticket.

Challenges and Opportunities

- Inherent dangers of the south coastal and marine environments.
- Predicted increase in extreme weather events due to climate change (see *Climate Change*).
- Difficulties with communications and coastal access for emergency rescue personnel.
- Trend towards outdoor recreation among a growing population.
- Competition for access to resources by increasing numbers of different users.
- Move from formal to informal recreational pursuits.
- Increased risk-taking in many recreational activities.
- Commodification of higher risk activities (including through encouragement from tour operators).
- Rise of extreme sports within participant groups which are generally isolated from the mainstream and therefore difficult audiences with whom to communicate.
- Increase in small boat ownership.

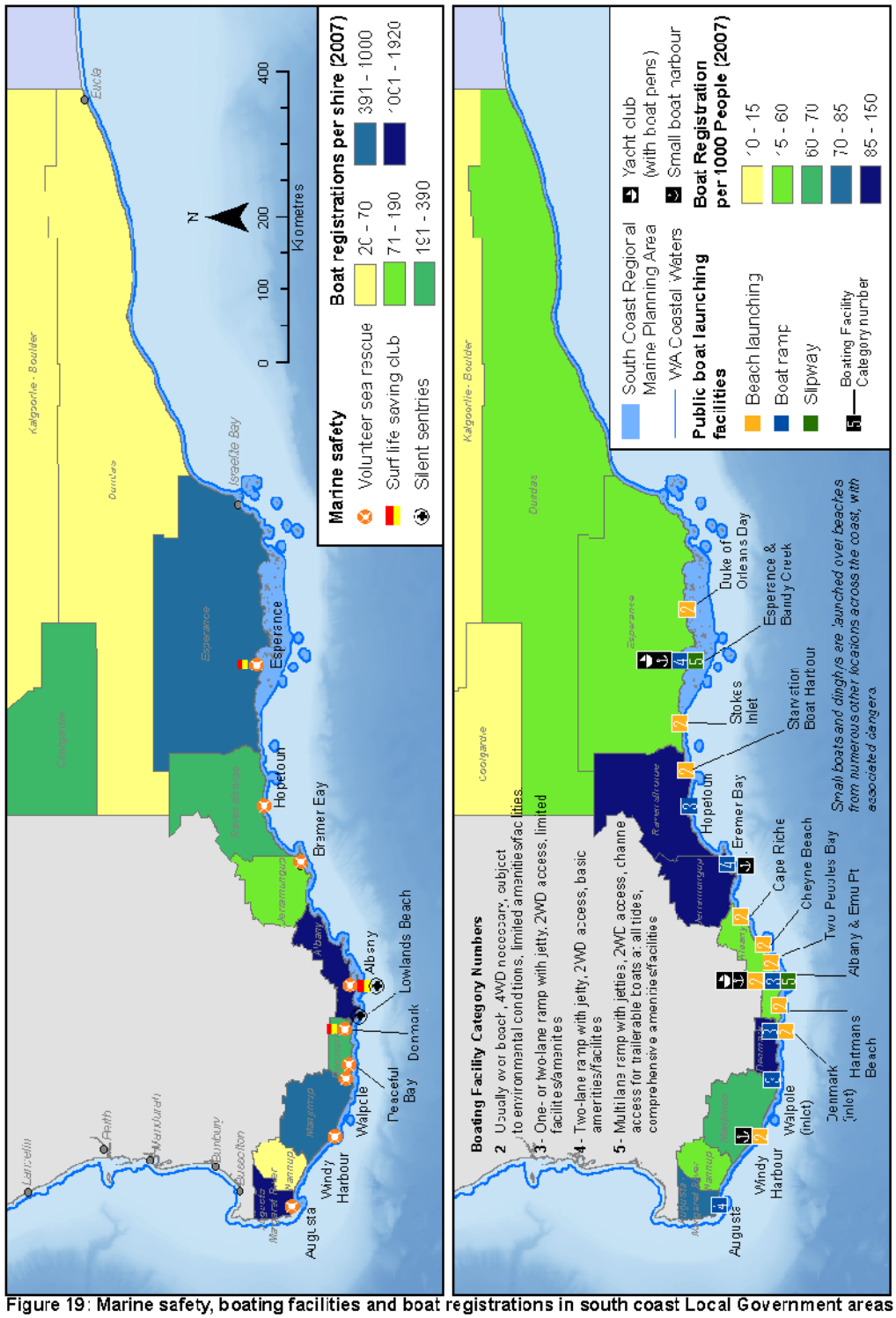


Figure 19: Marine safety, boating facilities and boat registrations in south coast Local Government areas

For map source information see Appendix 4

- Hazards posed by the use of vehicles on beaches.
- Provision of adequate, safe, open water boat launching facilities along the south coast (see *Coastal Development*)

Objectives

- To provide safe and enjoyable recreational experiences on the south coast.
- To ensure the safety of commercial maritime operators and recreational users.
- To reduce the per capita numbers of safety incidents.

No. C2.16	Proposed Strategies for Marine Safety	Responsibility for Initiation	Timing of Initiation
	General		
G1	Continue to monitor trends in coastal and marine use and develop and refine safety programs in response to the findings.	DoT, DEC, LGA	Underway (WAG, NGO)
G2	Continue to provide education programs about coastal safety to users and providers.	DoT, DEC, LGA	Underway (WAG, NGO)
G3	Encourage the further development of codes of conduct for high risk sports.	ICG	Years 3-5
G4	Explore innovative delivery options for educating isolated recreational groups (e.g. internet chat forums).	ICG	Years 3-5
G5	Continue to maintain regular contact with tour operators regarding safety issues, liability issues and codes of practice.	TWA, DEC, DoF	Underway (WAG, NGO)
G6	Work with the Tourism Accreditation Council to address risk management in marine tourism activity provision.	TWA, Tourism industry bodies	Years 3-5
G7	Monitor trends in visitor safety and impacts of safety programs on activities and review safety programs in the light of findings.	DoT, DEC, LGA	Underway (WAG, NGO)
G8	Continue to support the activities of non-Government maritime safety organisations.	ICG, LGA	Underway (WAG)
G9	Review current coastal access and ensure provision of adequate safe access to key sites on the coast for visitors of all abilities.	DoP, DoT, DEC, LGA	Years 1-2
G10	Support improvements in communications and coastal access for use in emergency rescue operations.	ICG, LGA	Underway (WAG, NGO)
G11	Engage the maritime safety sector in planning and management of all activities and developments likely to impact on the south coast marine environment or its users (see *Cooperation and Integration*).	ICG	Underway (WAG, NGO)
G12	Continue to engage marine stakeholders in the planning and management of safety programs and marine emergency responses.	ICG	Underway (WAG, NGO)
G13	Plan collaboratively for marine safety across Government and non-Government organisations.	ICG	Underway (WAG, NGO)
G14	Encourage consistency in safety signage and education programs.	ICG	Underway (WAG, NGO)

C3. EDUCATION AND RESEARCH

C3.1 Marine Education

Context
A vital component of achieving marine management goals is seeking to make all people who interact with the marine environment aware of its intrinsic values and their actual or potential impacts upon it. Education can be delivered through formal channels such as schools and universities, via Government information programs and through community-based projects.

Comprehensive marine education programs include components such as marine biology and ecology; maritime safety; health; fisheries science and management; aquaculture; environmental management; food science; marine research; boating skills; marine tourism; maritime history; maritime employment opportunities; and many others.

A limited number of schools on the south coast, including Albany Senior High School, Esperance Primary School and Great Southern Grammar conduct formal but optional marine education programs for students. Many other schools run informal marine education sessions, many of which are organised in conjunction with representatives of South Coast Natural Resource Management Inc. and the South West Catchments Council. In addition, schools from other parts of Western Australia visit the region to learn about the south coast marine environment (e.g. visits to Albany by St Mary's Girls School in Perth). Marine education is currently viewed as an "enrichment" activity in the school curriculum. Tertiary institutions based on the south coast also offer a number of courses which focus on aspects of the marine environment.

All Government agencies with marine responsibilities conduct outreach programs aimed at providing members of the public with the knowledge required to be responsible users of marine environments. In conjunction with South Coast Natural Resource Management Inc., the Department of Fisheries employs a dedicated marine education officer in Albany. "Fisheries Volunteers" (formerly Voluntary Fisheries Liaison Officers) based at Denmark, Albany and Esperance also provide education in sustainable fishing practices at schools, regional shows, festivals, community group meetings and fishing competitions. The volunteers are supported by the marine education officer who also facilitates other education initiatives on the south coast.

Volunteers are also active in providing education on marine safety (see *Marine Safety*). Sea Rescue groups based in Esperance, Hopetoun, Bremer Bay, Albany, Denmark, Peaceful Bay, Walpole, Windy Harbour and Augusta promote safe marine recreation as well as conducting sea search and rescue operations. Surf Life Saving Western Australia is also active in educating users of the marine environment, with a presence in Esperance, Albany and Denmark.

The natural resource management sector plays a key role in marine education with South Coast Natural Resource Management Inc. and South West Catchments Council both employing coastal and marine staff specialising in this area. Marine education activities, such as the South Coast Natural Resource Management "Saltwater Treasures" program, promote active participation of members of the public in collecting information about the south coast marine environment. Coastcare, Coastwest and "Caring for Our Country" programs are also active along the south coast and play an important role in coastal and marine education.

Challenges and Opportunities
- Fragmentation of educational activities.
- Resourcing of school-based and community education programs.
- Coordination of educational approaches across sectors and various media.
- Determining the optimal mix of educational messages and approaches.
- Availability and currency of suitable educational resources.
- Cost effectiveness of Government education programs.
- Educational resource availability to schools.
- Regionalising the marine curriculum for the south coast.
- Availability of suitably qualified teachers for school-based marine education programs.
- Acceptance of the importance of ocean literacy in the science teaching community.

- Communicating the results of marine research (see *Marine Research*).
- Monitoring the success of education programs.
- Opportunities for resource sharing.
- Scope for partnerships (e.g. with the charter industry).

Objectives
- To coordinate and integrate coastal and marine education programs across the south coast.
- To improve understanding of marine values and risks among south coast marine users.
- To improve levels of compliance with marine regulations.

No. C3.1	Proposed Strategies for Marine Education*	Responsibility for Initiation	Timing of Initiation
	General		
G1	Develop and implement a comprehensive regional level marine and coastal education plan incorporating curriculum-based, Government agency and community elements.	ICG	Years 1-2
G2	Continue existing marine education programs on the south coast.	ICG, DET, NRMG	Underway (WAG, NRMG)
G3	Encourage inclusion and promotion of a comprehensive marine component in the core school curriculum from Kindergarten to Year 12.	ICG, DET, NRMG	Years 1-2
G4	Develop regionally-based education resources for teachers.	ICG, DET	Years 1-2
G5	Encourage integration of marine and coastal education with programs covering estuarine and catchment issues.	ICG, DET, NRMG	Years 3-5
G6	Involve research staff in developing and implementing marine education programs.	ICG	Years 3-5
G7	Ensure clear messages about management decisions are included in education programs.	ICG	Years 3-5
G8	Expand education programs for non-resident users of the south coast.	ICG	Years 3-5
G9	Monitor the effectiveness of education programs.	ICG	Underway (WAG, NRMG)

* See also education strategies in individual sections of this strategic framework.

C3.2 Marine Research

Context
Knowledge is an essential prerequisite for effective marine (and coastal) planning and management, with environmental, economic, social and cultural research all required. An impressive body of knowledge about the marine waters of the south coast has already been gathered, as indicated in other sections of this document. There is a need, however, for continuing effort to fill information gaps, to ensure integration and to keep up with changing circumstances.

Scientific research has been conducted on Western Australia's south coast by tertiary institutions, State Government entities, private companies, natural resource management bodies, individual scientists and community volunteers. There is potential to better utilise the knowledge and expertise of residents of the south coast to help guide and support research efforts. Information has been gathered in a wide range of areas, including benthic habitats, marine plants and animals, oceanography, water chemistry and quality, geology and mineral and petroleum resources.

Information about the economic and social circumstances of the region is gathered by the State and Australian Governments, tertiary institutions and the private sector. Cultural information appears less comprehensive, with a limited number of surveys of Aboriginal heritage undertaken along the coast.

While much excellent research has been conducted in the region, there is a clear and ongoing need for further work to underpin planning and management of the south coast marine environment and its many uses. Facilities such as "iVEC", Western Australia's advanced computing hub for researchers and industry, are important in the storage and analysis of marine data. There is also a need to ensure the accessibility of data for planners, managers, marine stakeholders and members of the public. Web-based applications such as the BlueNet Metadata Entry and Search Tool are being developed to assist with locating maps, datasets, imagery, documentation and related applications for marine science.

Challenges and Opportunities

- Lack of comprehensive research coverage across the region in all disciplines.
- Lack of a coordinated approach to information gathering in the region.
- Need for alignment of research and monitoring programs with clear policies and management imperatives.
- Relative remoteness and lack of available researchers.
- Changing circumstances requiring continuous updating of existing information.
- Current focus on research in the north of the State particularly in connection with resource projects.
- A need to carry out management actions in the absence of complete information.
- Data access and security requirements.
- Restricted public access to existing data.
- Providing for adequate data storage in a manner which is accessible to planners, managers, marine stakeholders and members of the public.
- Management of potential adverse impacts of marine research on the marine environment.
- Communicating the results of marine research (see *Marine Education*).
- Numerous opportunities for worthwhile and challenging research projects.
- Prioritising research tasks.
- Potential for the participation of schools, community groups and interested individuals in research projects.

Objectives

- To improve knowledge of the south coast marine environment, its uses and the factors which influence it.
- To facilitate access to existing information by planners, managers and members of the public.

No. C3.2	Proposed Strategies for Marine Research*	Responsibility for Initiation	Timing of Initiation
	General		
G1	Develop an integrated marine research plan for the south coast.	ICG, WAMSI	Years 1-2
G2	Encourage the establishment of multi-disciplinary project teams including planners, managers and researchers.	ICG, WAMSI	Years 1-2
G3	Seek access to data held by corporations, consultants and Non-Government Organisations.	ICG, WAMSI	Underway (WAG, TI, NRMG, Ind, NGO)
G4	Coordinate intra-State as well as State and Commonwealth research efforts.	ICG, WAMSI	Underway (WAG, AG, TI, NRMG)
G5	Develop, maintain and disseminate a central register of research projects for south coast marine waters.	ICG, WAMSI	Years 3-5
G6	Encourage the conduct of further baseline research.	ICG, WAMSI	Years 3-5
G7	Conduct regular reviews of research requirements based on predictions of future information needs.	ICG	Years 6-10

G8	Continue to identify and approach potential funding sources for south coast research.	ICG, WAMSI	Underway (WAG, AG, TI, NRMG)
G9	Maintain a central register of available research expertise.	ICG	Years 3-5
G10	Identify and develop facilities to support research along the south coast.	ICG	Years 3-5
G11	Expand the structured involvement of schools and members of south coast communities in research activities.	ICG, DET	Years 3-5
G12	Make research results publicly available where possible.	ICG, WAMSI	Underway (WAG, AG, TI, NRMG)
G13	Base decisions on management of marine usage on the best available information, applying the Precautionary Principle.	ICG	Underway (WAG, AG)
G14	Continue to develop and maintain a Geographic Information System housing all available data relevant to south coast marine waters for use by planners, managers and members of the public.	ICG	Underway (WAG, NRMG)
G15	In conjunction with researchers, ensure that potential adverse impacts of marine research are considered in project designs.	ICG	Years 3-5
G16	Restrict access to sensitive research data where there is potential for its inappropriate use.	ICG	Years 1-2
G17	Encourage the development of suitable systems for housing and dissemination of research results.	ICG, WAMSI	Years 1-2

* See also research strategies in individual sections of this strategic framework.

C4. ADJACENT LANDS AND WATERS

C4.1 Adjacent Lands

Context

The south coast marine region is bounded by land from a wide range of tenures, including private and leasehold land, conservation reserves and Local Authority land. Each tenure has an existing planning and management regime (see also *Coastal Development*).

Twenty two national parks and nature reserves abut the south coast. From west to east, these are:

- Leeuwin-Naturaliste National Park;
- D'Entrecasteaux National Park;
- Walpole-Nornalup National Park;
- Quarram Nature Reserve;
- William Bay National Park;
- West Cape Howe National Park;
- Torndirrup National Park
- Gull Rock National Park
- Two Peoples Bay Nature Reserve;
- Waychinicup National Park;
- Mount Manypeaks Nature Reserve;
- Arpenteur Nature Reserve;
- Fitzgerald River National Park;
- Lake Shaster Nature Reserve;
- Stokes National Park;
- Un-named Nature Reserve (27888);
- Un-named Nature Reserve (26885);

- Mullet Lake Nature Reserve;
- Cape Le Grand National Park;
- Cape Arid National Park;
- Nuytsland Nature Reserve; and
- Eucla National Park.

Most south coast islands are also nature reserves. These lands are managed by the Department of Environment and Conservation under the *Conservation and Land Management Act 1984*. They are covered by a series of regional and area management plans which detail the operations and other approaches required to protect conservation values and provide for appropriate use. The Department of Environment and Conservation is currently (2010) preparing management plans for the conservation reserves of the Albany coast and the Esperance coastal reserves.

Privately owned land on the south coast includes both residential and agricultural land. Planning and management of this land is subject to a range of statutes, regulations and policies (see *Coastal Development*). At the eastern end of the south coast marine region, one pastoral lease borders the coast. This land is managed under the *Land Administration Act 1997* through the Pastoral Lands Board.

A variety of Local Authority Reserves lie along the south coast, with purposes including reserves for public open space, recreation, conservation and roads. Each reserve is managed under relevant State and/ or local legislation and policy. Unallocated Crown lands are administered by the Department of Regional Development and Lands under the *Land Administration Act 1997*. Some management tasks are carried out by the Department of Environment and Conservation under a Memorandum of Understanding.

A number of disused submarine cables once provided power to facilities on offshore islands on the south coast. New submarine cables may be required to take power from offshore renewable energy facilities to the coast (see *Renewable Energy*).

Coastal lands and islands provide important habitat for many marine and terrestrial species of mammals, birds, reptiles and invertebrates (see *Marine Conservation*). Further inland, land use practices in catchments can also impact on the marine environment (see *Catchment Management*).

Challenges and Opportunities

- Integrating planning and management of the south coast marine region with terrestrial planning and management processes including Local Government planning schemes and reserve management.
- Ensuring strategies to minimise marine impacts are incorporated in terrestrial planning and management approaches.
- Complexity of land tenure along the south coast.
- Provision of a range of visitor experiences along the coast from those requiring more highly developed areas to those requiring wilderness.

Objective

- To integrate terrestrial and marine planning and management.

No. C4.1	Proposed Strategies for Adjacent Lands	Responsibility for Initiation	Timing of Initiation
	Sustainability		
S1	Coordinate stakeholder engagement processes in terrestrial and marine planning processes where possible.	ICG	Years 1-2
	Inter-sectoral coordination		
C1	Engage marine sectors in planning and management of all terrestrial activities and developments likely to impact on the south coast marine environment or its users (see *Cooperation and Integration*).	ICG	Underway (WAG, NRMG)

C2	Integrate planning and management of visitor facilities and opportunities in the marine and terrestrial environments.	ICG	Years 3-5
C3	Coordinate marine planning inputs to terrestrial planning processes through a cross-sectoral Implementation Coordinating Group (see *Cooperation and Integration*)	ICG	Years 1-2

C4.2 Coastal Development

Context
The attractive coastline, rise of the "sea change" phenomenon and commercial and residential developments are combining to increase the demand for development on the south coast. Greater disposable income and more flexible working hours are also contributing to increased recreational use of coastal and marine resources.

By national standards, the south coast of Western Australia is not highly developed and major impacts are largely confined to areas in close proximity to existing settlements. Some 54% of the southern coastline is located within conservation reserves managed by the Department of Environment and Conservation. However, coastal land for housing, tourist accommodation and facilities for recreational and commercial uses is currently in strong demand, resulting in pressures on coastal areas, resources and traditional developments such as caravan parks. There is a need for a good understanding of natural variability when planning and managing developments on the south coast.

Along with the visible population pressures on the coast, growing evidence of climate change foreshadows additional impacts on coastal resources in the region. Wetlands, estuaries, beaches, dune systems, seagrass meadows and other sensitive coastal ecosystems are all vulnerable. The risks of rising sea levels, decreasing rainfall and increased frequency and intensity of extreme weather events have implications for developments on the coastline. Additionally, increased coastal hazards are expected from changes in coastal processes, with potential impacts on coastal reserves, infrastructure and the economic base of many coastal communities (see *Climate Change*). While some progress has been made in accommodating these issues in coastal planning and development, further work is required.

The Australian Centre of Climate Change Adaptation, in conjunction with relevant jurisdictions, has undertaken a "first pass" national assessment of Australia's coastal vulnerability to the impacts of climate change. The project has identified, among other things, areas of Australia's coast with high, medium or low potential impacts arising from climate change. As part of this assessment, three-dimensional maps of ground surface topography, or Digital Elevation Models, have been produced to assess the potential impacts of storm surges. The outputs of this assessment will provide valuable guidance for development along the south coast.

Long term planning for the coast is essential to ensure its continued socio-economic and environmental health. The *National Cooperative Approach to Integrated Coastal Zone Management, Framework and Implementation Plan*, agreed by the Australian Government and all States and Territories, sets the scene for national cooperation in five areas, including:

- land and marine-based sources of pollution;
- managing climate change;
- introduced pest plants and animals;
- allocation and use of coastal resources; and
- capacity building.

The Western Australian Planning Commission prepares State Planning Policies under the *Planning and Development Act 2005* to provide broad land use planning controls and guide development around the State. It is beyond the scope of this document to propose changes to the land use planning system. *State Planning Policy No.2: Environment and Natural Resources* sets out the broad environment and resource management policies for sustainability and includes mechanisms to safeguard and enhance areas of environmental significance on the coast, while ensuring use and development on or adjacent to the coast is compatible with conservation and recreation.

The State Coastal Planning Policy (State Planning Policy No.2.6) was gazetted in 2003 to guide regional and local coastal planning throughout the State. It deals with the widespread development pressures on coastal regions resulting from growing populations. The policy also includes guidance on coastal setback requirements in relation to the potential impacts of climate change, sea level rise and the dynamic nature of coastal processes, including the calculation of:

- S1: distance for absorbing extreme storm sequences;
- S2: distance to allow for historic trends (100 x annual rate);
- S3: distance to allow for sea level change (38m).

Under the policy, a foreshore reserve must also be established to allow for recreational use, visual amenity, cultural and Aboriginal heritage, protection of ecological values and conservation of biodiversity and landforms. The policy recommends building height limits for development on the coast and requires the preparation of foreshore management plans to provide guidance on factors such as rehabilitation, coastal hazards and protection of environmental values of the foreshore.

The Country Coastal Planning Policy (Development Control Policy 6.1) was adopted in 1989 and applies to the whole State, rather than just country areas. The policy is intended to assist local authorities, developers and planning consultants by providing a set of general guidelines which set out the Western Australian Planning Commission's approach to coastal development. The objectives of the policy are to:

- encourage orderly and balanced development on and adjacent to the coast;
- provide guidance on the protection, conservation and enhancement of coastal resources; and
- ensure that public access is consistent with the protection of coastal resources.

The policy relates primarily to new developments and subdivisions and may not always be applicable to areas previously developed and subdivided.

The Coastal Planning and Coordination Council is a statutory body established in 2003 under the *Western Australian Planning Commission Amendment Act 2003* to provide guidance on the development of policy, to encourage strategic relationships and to highlight priorities and actions to ensure an integrated and sustainable coastal system.

Strategic guidance for coastal development can also be provided by coastal planning strategies developed by Local Government authorities. The Western Australian Planning Commission maintains an inventory of coastal planning projects throughout the State. The *Annual Status of Coastal Planning Report* includes an audit of current and outstanding coastal planning documents for the south coast region. The Shire of Nannup, for example, has prepared a site specific coastal plan from Black Point to the boundary of the Augusta-Margaret River Shire. Local Government Town Planning Schemes and Structure Plans are also important mechanisms in guiding coastal development decisions on the south coast.

There are a number of regional planning documents relating to development of stretches of the south coast. The Augusta Walpole Coastal Strategy sets out broad directions for the Augusta-Walpole coastal region. It provides a framework for coastal planning, management and sustainable use of the coast, while tackling issues such as coastal access, development, tenure and retention of environmental values.

The *Lower Great Southern Strategy* (2007) addresses land use, transport and infrastructure requirements for the City of Albany and Shires of Denmark, Plantagenet and Cranbrook. The Strategy provides a number of recommendations to guide coastal development in the region and acknowledges potential conflicts arising from provision for regional infrastructure, priority agricultural land, minerals and resources, water sources, conservation and tourism facilities.

Similarly, the *Goldfields – Esperance Regional Planning Strategy* (2000) provides a policy framework to guide future land use, transport and infrastructure development in the region. The Strategy contains a Coastal and Marine Environment Protection and Conservation Strategy for the future management of the waters and coastal environs within the Goldfields-Esperance Region.

Land development proposals, including for coastal lands, are considered within a statutory framework established by Region Schemes (where they exist) and Local Planning Schemes, under the provisions

of the *Planning and Development Act 2005*. A Local Planning Scheme may include, but not be limited to, considerations such as:

- key coastal development nodes and zones;
- coastal reserves and recreational/ conservation areas;
- access;
- allocation of facilities and amenities; and
- sewerage and drainage.

Local authorities from Esperance to Denmark (and formerly the Shire of Dundas) are members of the "South Coast Management Group", which fosters integration and coordination of coastal planning and management. *Southern Shores 2009-2030: A strategy to guide coastal and marine planning and management in the south coast region of Western Australia* was produced by the group in 2009. This document is a revised version of an earlier document produced in 2001 and which was the first to provide an integrated coastal and marine strategy for a significant proportion of the south coast (see *Context for South Coast Regional Marine Planning*).

There is currently a large demand for coastal access for small craft, ranging from windsurfers to large commercial fishing boats, along the southern coast. Based on recreational boat registration trends and predictions, this will continue to increase. At present, there are a number of established small craft harbours in the region (managed by the Department of Transport) and formal boat launching facilities under Local Government control (see Figure 19). Many of the existing harbours were established for commercial purposes but are now becoming recreationally focussed.

Several factors affect the suitability of a coastal site for development of boating facilities (either recreational or commercial), including:

- the availability of natural protection from storm conditions (shelter from both swell and storm waves);
- safe access to nearshore sheltered waters as well as a safe route to the open sea;
- availability of adequate water depths (including freedom from hidden hazards);
- proximity to desirable boating activity destinations;
- proximity to centres of present and future population;
- compatibility of adjacent land and water uses; and
- environmental acceptability.

The *Australian Pilot Guide Volume 1*, published by the Australian Hydrographic Service of the Royal Australian Navy, details safe anchorages along the southern coast of Australia. Where anchorages are identified, land access is sought to the adjacent coastal sites. Local authorities provide public boat launching facilities and, with assistance from the Department of Transport's Recreational Boating Facilities Scheme, have implemented upgrades in many areas. However, very few new facilities have been established over recent years, as suitable sites have already been developed. It has become commonplace for access and boat launching to occur across beaches along the southern coast. This is often uncontrolled and sea conditions frequently make this a dangerous exercise (see *Marine Safety*).

The provision of moorings for recreational boating is the responsibility of the Department of Transport, except in marine parks and reserves where it is managed by the Department of Environment and Conservation and within port controlled areas where it is the responsibility of the relevant Port Authority. There has been a growth in recreational demand for pens and fixed moorings on the south coast. Commercial fishers have also been seeking to moor vessels in more remote areas to access lesser utilised fishing areas. The construction of marinas has not kept pace with demand and in some areas they are not an option for environmental or engineering reasons, so moorings have become a cost effective option in some areas. The Department of Transport operates mooring control areas, with fees, at high-demand locations. The Department also reviews the placement of moorings in other areas, but does not charge fees.

In 2002, a joint policy was developed by the Marine Parks and Reserves Authority and the Department of Environment and Conservation for the management of moorings in marine parks and reserves of Western Australia. This policy is currently being reviewed, specifically analysing the legislation under which moorings are managed in marine parks and reserves. In conjunction with this, the Department

of Environment and Conservation is developing a Statewide strategy for the management of public and private moorings in marine parks and reserves.

Opportunities exist for the development of key partnerships between community groups and Local and State Governments involved in planning and management activities along the south coast. The three natural resource management groups along the south coast are active in strategic planning and management projects and their activities need to be integrated with those of Government and the private sector.

The Coastwest program, supported by the Western Australian Planning Commission, provides funding for community groups to work in partnership with Local Governments and coastal managers to undertake work that will improve the condition and amenity of the coastline. This includes restoration of degraded coastal areas, improving beach access and increasing awareness of the natural and heritage values of the coast. There are currently a number of Coastwest-funded projects being undertaken on the south coast.

Challenges and Opportunities

- The nature of the coastal landscape of the south coast, such as rugged topography, valuable agricultural land, the high number of inlets and estuaries and the limited existing infrastructure which places constraints on development.
- The impacts of natural variability in conditions on the south coast.
- The impacts of climate change, particularly rising sea levels, decreasing rainfall and predicted increased frequency and intensity of extreme weather events.
- Increasing pressures on existing development and infrastructure from influxes of new residents from the sea change/ tree change trend.
- Increasing recreational use of coastal and marine resources and associated impacts on coastal and marine areas.
- Limited sources of information on visitor numbers.
- Competition for land between the increasingly popular nature-based tourism industry and the demand for permanent residential development.
- Funding for Local Government authorities to undertake adequate coastal planning activities.
- Limited resources available for the acquisition and management of foreshore reserves compared to the length of the southern coastline.
- Increasing pressure on existing small craft facilities due to population growth, higher numbers of visitors and increased numbers and range of water craft and marine activities.
- Moorings can impact on scenic values, have poor density yields, reduce common use of marine areas and lead to disputes when they are used by unauthorised vessels.
- Difficulty of providing safe, environmentally sensitive access to popular beaches in isolated locations, especially given the rugged nature of coastline.
- Over-beach launching is in many areas environmentally unacceptable and dangerous.
- Limited availability of land for maritime facilities and infrastructure, including ports and land for parking and associated commercial activity.
- Unsatisfactory outcomes caused by some coastal developments.
- Limited resources available for management of the south coast.

Objectives

- To improve integration of planning and management for marine and coastal areas and developments.
- To incorporate a range of environmental, community and social benefits into coastal facilities.
- To base coastal development decisions on adequate coastal and marine information.
- To maintain the current cultural and environmental character of the south coast through sensitive and sustainable coastal development.
- To reduce adverse marine impacts from coastal development.

No. C4.2	Proposed Strategies for Coastal Development*	Responsibility for Initiation	Timing of Initiation
	Sustainability		
S1	Continue to assess, monitor and manage the marine implications of coastal development activities.	DoP, DEC, LGA	Underway (WAG, Ind)
S2	Maximise the potential of existing maritime facilities in preference to establishing new infrastructure.	DoT, LGA	Underway (WAG)
S3	Encourage consideration of inland sites for developments for which coastal locations are not essential.	DoP	Underway (WAG)
S4	Identify, where necessary, future sites for the development of coastal infrastructure to support marine activities, according to the anchorages identified in the *Australian Pilot Volume 1* and encourage their inclusion in Town Planning Schemes.	DoT	Underway (WAG)
S5	Review existing moorings and mooring policies on the south coast and modify them as required.	ICG, LGA	Years 3-5
S6	Gather and disseminate information on trends in marine environments and their usage, to assist in the formulation of robust projections of other coastal development needs for the entire south coast.	ICG	Underway (WAG)
S7	Consider the cumulative impact of proposed coastal developments on the character of the south coast.	ICG	Years 1-2
S8	Encourage continual review of approval processes for coastal developments.	ICG	Underway (WAG)
S9	Continue to engage both coastal and marine stakeholders and members of the public in coastal planning and development activities.	ICG	Underway (WAG, NRMG, Ind)
S10	Facilitate the further education of catchment managers in the marine impacts of development decisions inland from the coast.	DoW, NRMG	Years 3-5
S11	Provide education programs to raise public awareness of the marine implications of coastal development decisions.	ICG	Underway (WAG, NRMG)
S12	Support public engagement in coastal planning and management through programs such as Coastwest.	DoP, LGA, NRMG	Underway (WAG)
S13	Seek additional resources for the acquisition and management of foreshore reserves.	DoP, DEC, LGA	Years 1-2
S14	Encourage financial contributions from developers to assist in the ongoing management of coastal and marine areas affected by development.	DoP, LGA	Underway (WAG, Ind)
S15	Ensure the potential impacts of climate change and natural variability are factored into all coastal planning and management activities.	DoP, LGA, OCC	Underway (WAG, Ind)
S16	Continue to prepare coastal and foreshore management plans as soon as existing and/ or potential use indicates a need.	DoP, LGA	Underway (WAG)
S17	Encourage further research to inform sustainable coastal development and disseminate results to coastal planners and managers.	ICG, NRMG	Years 3-5
S18	Encourage research into the natural variability of the south coast marine environment.	ICG	Years 3-5
	Inter-sectoral coordination		
C1	Identify priority areas for coastal development through the proposed marine value and usage mapping process (see *Cooperation and Integration*).	ICG, LGA	Underway (WAG)

C2	Integrate planning for coastal development across all tenures and levels of Government.	ICG	Underway (WAG)
C3	Continue to engage the natural resource management sector in coastal development planning.	ICG, NRMG	Underway (WAG, NRMG)
C4	Integrate the implementation of this strategic framework with the activities of community-based organisations such as the South Coast Management Group.	ICG, NRMG, LGA	Underway (WAG, NGO)
C5	Encourage Local Government authorities to incorporate consideration of marine impacts and issues in their local planning and coastal development strategies.	DoP, LGA, NRMG	Underway (WAG)

* A number of the strategies in this section are existing requirements under the State Coastal Planning Policy (SPP2.6). They are reiterated here for completeness.

C4.3 Catchment Management

Context

A total of 66 catchments enter the ocean along the south coast, with many of the rivers entering the sea through estuaries. Although outside the direct scope of this strategic framework, land use practices in catchments along the south coast can have a significant impact on the marine environment and thus consideration of catchment management is required.

Catchment drainage waters can contain nutrients, sediments and pollutants, all of which can make their way to sea (see also *Marine Water Quality*). Changed hydrology in the form of increased run-off due to clearing of vegetation can alter estuary connections with the Southern Ocean. Catchment management activities are being conducted by Government agencies, landholders and natural resource management groups with the intention of improving land, biodiversity and other natural resources within catchments as well as the quality and quantity of catchment outflows (see also *Estuaries*).

Considerable on-ground effort is being directed at the following Strategic Catchments: Bremer; Fitzgerald River; Frankland-Gordon; Lake Warden; Oyster Harbour (Kalgan River); middle Pallinup; Stokes (Young River); Torbay; West River; and Wilson Inlet (Upper Hay River). The Ramsar-listed wetlands of Lake Warden and Lake Gore and their catchments are the focus of other land management programs.

The rapid expansion of so-called “lifestyle blocks” on the fringe of urban areas is having a significant impact on the management of catchments and their receiving water bodies. These peri-urban areas, as they have become known, are often associated with altered hydrology due to clearing of native vegetation and increased levels of nutrient, sediment and pesticide runoff to water bodies and the sea. Management of peri-urban impacts is receiving increased attention from regional natural resource management bodies, through initiatives such as small landholder advisory services and grant programs.

Extreme weather events in heavily cleared south coast catchments, such as the 2007 floods in the Esperance area which filled the Bandy Creek Boat Harbour with sediment, are likely to occur more frequently as a result of climate change.

Challenges and Opportunities

- Extensive catchments (with hundreds of individual landowners) drain to the south coast, making it difficult to significantly alter the quality and quantity of outflows.
- Resources are limited and therefore need to be targeted.
- Climate change and increased water use may reduce freshwater inputs to estuaries and coastal waters, affecting salinity levels and frequency of sand bar openings as well as reducing social and environmental values.
- Increased likelihood of extreme weather events in catchments causing damage to coastal and marine infrastructure and marine environments.
- Current natural resource management structures are enabling progress in integrating terrestrial and marine planning and management.

- A network of catchment groups which already exists, supported by regional and sub-regional natural resource management groups and agencies, is seeking to change land use practices in the region.
- Priority and strategic catchments have been identified and are receiving targeted action to improve natural resource management outcomes.

Objective
- To reduce adverse marine impacts from the altered drainage, water quality and outflow from catchments.

No. C4.3	Proposed Strategies for Catchment Management	Responsibility for Initiation	Timing of Initiation
	Sustainability		
S1	Extend monitoring of the quality and quantity of catchment outflows and the resulting marine impacts and advise catchment managers of the results, to assist in design of appropriate management measures.	ICG	Years 1-2
S2	Encourage further research into the impacts of catchment outflows on marine environments and users and use results in the design of catchment management approaches.	ICG, NRMG	Years 3-5
S3	Provide education programs for catchment managers on the impacts of their activities on marine environments and users.	ICG, NRMG	Underway (WAG, NRMG)
S4	Encourage research on the impacts of climate change on estuary condition and values.	DoW, NRMG, OCC	Years 3-5
S5	Continue to support targeted catchment restoration initiatives aimed at improving water quality in priority estuaries and marine waters.	ICG, NRMG	Underway (WAG, NRMG)
	Inter-sectoral coordination		
C1	Engage catchment managers in planning and management of all activities and developments likely to impact on the south coast marine environment or its users (see *Cooperation and Integration*).	ICG, NRMG	Underway (WAG, NRMG)
C2	Encourage coordinated catchment planning and management by Government agencies, natural resource management groups and landowners.	ICG, NRMG	Underway (WAG, NRMG)

C4.4 Adjacent Waters

Context
The south coast Regional Marine Planning region comprises over 1.75 million hectares of State waters and covers some 2,600 kilometres of coastline. “State waters” extend three nautical miles (approximately five kilometres) from the mainland coast, but extend further where there are islands close to the coast (as they fall under State jurisdiction). Hence, in the Recherche Archipelago group of islands, for example, State waters extend some 30 nautical miles from the mainland (see Figure 1). The south coast marine region is bordered by Commonwealth waters to the south, South Australian waters to the east and Western Australia’s west coast waters to the west.

Commonwealth territorial waters extend from the three nautical mile limit of State waters to 12 nautical miles. From here to 200 nautical miles is Australia’s “Exclusive Economic Zone”, also under the jurisdiction of the Australian Government. Adjacent to the eastern boundary of the Regional Marine Planning study area is South Australia’s Great Australian Bight Marine National Park. The Australian Government’s Great Australian Bight Marine Park includes waters immediately south of the South Australian marine reserve.

State and Commonwealth marine jurisdictions are defined under Australia’s “Offshore Constitutional Settlement”. The approval of the Offshore Constitutional Settlement in 1979 was the culmination of a

series of agreements between the Australian and State and Northern Territory Governments regarding jurisdiction of coastal waters. The Offshore Constitutional Settlement was the precursor to the following Commonwealth Acts:

- The *Coastal Waters (State Title) Act 1980* (Commonwealth) which gives States and the Northern Territory title to an area called "coastal waters" consisting of all waters landward of the three nautical mile limit, but not including internal waters that are within the constitutional limits of a State; and
- The *Coastal Waters (State Powers) Act 1980* (Commonwealth) which gives States and the Northern Territory concurrent legislative power over coastal waters; that is, they were given the same power to legislate over coastal waters as they would have over their land territory.

The implementation of the Offshore Constitutional Settlement required the amendment of legislation that affects coastal waters, in areas such as fisheries management, regulation of offshore petroleum activities and shipping.

The legislative basis of the current Offshore Constitutional Settlement for fisheries, *Offshore Constitutional Settlement 1995, Fisheries Management Paper No. 77*, falls under the *Fisheries Management Act 1991* (a Commonwealth statute) for fisheries under Commonwealth jurisdiction and the *Fisheries Resource Management Act 1994* (a Western Australian statute) for fisheries under State and Joint Authority jurisdiction.

Under the *Petroleum (Submerged Lands) Act 1982* and *Petroleum (Submerged Lands) Amendment Act 1980* (Commonwealth) a similar arrangement exists for the Western Australian Government to regulate petroleum activities. The *Navigation Amendment Act 1980* delegates responsibility of all shipping other than that travelling interstate and internationally to the State.

The Australian Government has been undertaking Marine Bioregional Planning around Australia including preparation of a plan for the South West Marine Region which encompasses all Commonwealth waters adjacent to the State waters of the south coast. A Memorandum of Understanding for a cooperative, strategic approach to marine planning in waters adjacent to south west Australia was signed by the Commonwealth Department of the Environment, Water, Heritage and the Arts and the Western Australian Departments of Fisheries and Environment and Conservation. A Marine Planning Government Working Group has been operating since September 2006 to help integrate the activities of the Australian Government south west and Western Australian south coast marine planning processes. Joint stakeholder liaison has been conducted where feasible.

In 2009, the South Australian Government released provisional boundaries for 19 multiple-use marine parks comprising 46% of State waters for public comment. The proposed Far West Coast Marine Park abuts Western Australian waters at the border. South Australia has also commenced Regional Marine Planning for its waters, having released a Draft Marine Plan for the Spencer Gulf Region in 2006. Contact has been established with the marine planners in the South Australian Department of Environment and Heritage.

The Western Australian Government may consider Regional Marine Planning for other areas of Western Australia's State waters in the light of experience with the south coast process.

Challenges and Opportunities

- Planning for adjacent Commonwealth waters has been occurring concurrently with the south coast Regional Marine Planning process and both processes need to be integrated.
- The Australian Government Marine Bioregional Planning process has been delineating a marine conservation reserve system outside State waters. This provides an opportunity for pursuing complementary conservation outcomes in those instances where adjoining State and Commonwealth reserves are desirable and possible (see also *Marine Conservation*).
- Western Australia will complete Regional Marine Planning for the south coast before commencement of Regional Marine Planning for the adjacent Eucla region of South Australia.
- Regional Marine Planning for State waters north of Cape Leeuwin may follow the completion of the south coast process.
- Government stakeholder engagement activities run the risk of overlapping with each other.

Objective

- To integrate planning and management for State waters of the south coast with that for the west coast and for adjacent waters in other jurisdictions.

No. C4.4	Proposed Strategies for Adjacent Waters	Responsibility for Initiation	Timing of Initiation
	Sustainability		
S1	Seek cooperative management agreements with Governments having jurisdiction over adjacent waters where appropriate.	ICG	Underway (WAG, AG, SAG)
S2	Facilitate the continued exchange of marine information among the Western Australian, South Australian and Australian Governments.	ICG	Underway (WAG, AG, SAG)
S3	Monitor the impacts of marine activities occurring in adjacent waters and negotiate management arrangements with the South Australian and Australian Governments where required.	ICG	Underway (WAG, AG, SAG)
	Inter-sectoral coordination		
C1	Continue close liaison with the Australian Government planners to ensure integration of the respective marine planning processes and their implementation.	ICG	Underway (WAG, AG)
C2	Coordinate marine planning stakeholder engagement processes concurrently among the Western Australian, South Australian and Australian Governments where possible.	ICG	Years 1-2
C3	Advise the Australian Government on the State implications of any marine reserve network they may propose adjacent to Western Australian waters of the south coast.	DEC, DoF, WAM	Years 1-2
C4	Maintain contact with the South Australian Government and coordinate marine planning processes for the Western Australian south coast and South Australian Eucla marine regions.	ICG	Underway (WAG, SAG)
C5	Integrate any future Regional Marine Planning for the west coast with this strategic framework for the south coast.	ICG	Years 3-5

C5. COORDINATION

C5.1 Cooperation and Integration

Context

At present, the various marine sectors on the south coast carry out their own planning and management activities in relative isolation and at different scales and engaging with discrete stakeholder groups. To better integrate planning and management for the wide range of marine sectors, it will be necessary to characterise in space or in time the many sectoral values and uses of the south coast marine region. It is proposed that this be accomplished through the mapping of values and uses of the marine waters of the south coast (see also *Scope of the Document*). The purpose of the marine value and usage mapping process will be to facilitate the protection and management of identified values, including environmental, social, economic, cultural and other values, as well as to assist in the allocation of marine resources among multiple users. The mapping process will be independently coordinated by a process to be determined by State Government independent of sectoral issues and will involve an assessment of risk to all identified values in the area of interest.

All Western Australian Government agencies with marine responsibilities need to work closely with each other and to coordinate their combined efforts with other levels of Government as well as with the commercial sector, expert groups, other marine stakeholders and members of the public in implementing this strategic framework (see also *Implementation*). Regional Marine Planning is

overseen by an inter-departmental committee of agency Chief Executive Officers (see *Context for South Coast Regional Marine Planning*).

A cross-sectoral group is proposed to coordinate implementation of this strategic framework and to guide the integration of marine planning and management activities across all levels of Government, the commercial sector, marine stakeholders and members of the public. This Implementation Coordinating Group will need to be empowered by the Western Australian Government to perform a coordinating role within and outside Government. It must engage all marine stakeholders and members of the public in the delivery of integrated marine planning and management on the south coast. Adequate resources will be required by the coordinating group and its member organisations to ensure it is able to fulfil its proposed role in implementing this strategic framework over its 10-year life.

Challenges and Opportunities

- Different marine uses have different spatial and temporal ranges and priorities, which have not been explored in the Regional Marine Planning process.
- Better integrated planning for marine sectors will involve a degree of compromise to ensure the needs of all sectors can accommodated sustainably on the south coast.
- Potential for better coordination across all agencies and levels of Government for effective implementation of this strategic framework.
- Opportunity for coordination of Government activities in implementing this strategic framework with those of the commercial sector, marine stakeholders and members of the public.
- Need for consistency of implementation of this strategic framework with State-level marine policies.

Objectives

- To integrate planning and management of marine uses across all affected sectors.
- To develop a cooperative approach to the resolution of spatial and temporal conflicts among marine sectors.

No. C5.1	Proposed Strategies for Cooperation and Integration	Responsibility for Initiation	Timing of Initiation
	General		
G1	Ensure implementation of this strategic framework is consistent with State-level marine policies.	ICG	Years 1-2
G2	In conjunction with marine stakeholders and members of the public, carry out an independently coordinated marine value and usage mapping process to assist in the allocation of marine resources among multiple users.	WA Government	Years 1-2
G3	Designate a cross-sectoral Implementation Coordinating Group to oversee implementation of this strategic framework and to guide the integration of marine planning and management activities across all levels of Government, the commercial sector, marine stakeholders and members of the public.	WA Government	Years 1-2
G4	Seek sufficient resources to enable the effective operation of the Implementation Coordinating Group.	ICG	Years 1-2
G5	Engage all marine sectors in planning and management of marine activities and developments likely to impact on the south coast marine environment or its users.	ICG	Underway (WAG, AG, Ind, NRMG)
G6	Engage with all marine sectors in planning for any future marine protected areas on the south coast.	ICG	Underway (WAG, AG)

C5.2 Legislation and Policy

Context
Marine natural resources, uses and influences are administered through a plethora of Commonwealth, State and Local Government legislation, regulations and policies (see *Appendix 2*). At the State level, a large number of agencies have marine responsibilities (see *Administrative Frameworks*) and each is responsible for specific pieces of legislation which are listed within this document. This strategic framework complements (rather than duplicating or replacing) the existing legislative responsibilities and sectoral planning processes of individual agencies (see *The South Coast Regional Marine Planning Process*).

Western Australia is faced with the critical challenge of balancing the regional interests of land and marine development projects and the protection of the environment. The *Environmental Protection Act 1986* is Western Australia's prime environmental legislation and is the basis of most environmental approvals.

In addition to legislation, the Western Australian Government also has a range of statutory documents and policies relevant to marine planning and management, including:

- State Coastal Planning Policy (see *Coastal Development*);
- Ecosystem-based Fisheries Management (see *Fishing – General*);
- Integrated Fisheries Management (see *Fishing – General*);
- Aquaculture Plan for the Recherche Archipelago;
- Management Plan for the Walpole and Nornalup Inlets Marine Park.
- Creation of a marine protected area system in State waters (see *Marine Conservation*);
- Approach to creation of Marine Parks and Reserves outlined in the 1998 document titled *New Horizons - the way ahead in marine conservation and management* (see *Marine Conservation*);
- Provision of additional shore-based infrastructure such as boat pens (see *Coastal Development*)
- Joint State and Local Government funding for boat ramps (see *Coastal Development*).

An *Albany Harbours Planning Strategy* was produced in 1997 and covers appropriate uses for Albany's harbours (including Oyster Harbour, Princess Royal Harbour and King George Sound). Seven key policy areas are identified and primary supported activities identified in each of these. Other appropriate uses are detailed in guidelines to the strategy and an integrated approval process is documented for all activities in the harbours. A Planning Committee still meets regularly to discuss research, planning and development proposals for these areas. Members of the Committee are the Departments of Water, Fisheries, Environment and Conservation and Transport as well as the Albany Port Authority and the City of Albany.

A similar group, the Wilson Inlet Management Advisory Group, is an independent group, serviced at present by the Department of Water and the Shire of Denmark. Formed in 2004, the group has community and agency representation and provides advice on any matter in relation to Wilson Inlet. Prior to that it operated as a formal sub-committee of the Water and Rivers Commission Board, but chose to become independent in order to provide a wider range of views to all stakeholders.

The Wellstead Estuary Management Group is serviced by the Fitzgerald Biosphere Group and implements the estuary management plan, as well as providing a forum for all matters concerning Wellstead estuary, located at Bremer Bay. The group has existed since 2005 when the plan was completed and receives external funding for a project officer. The group now provides a forum for the discussion of all matters in relation to the Inlet.

Management groups have also been established for Stokes and Culham Inlets, to implement plans prepared for both. It is expected the groups will provide forums for discussion of all management issues concerning these inlets.

Australian Government legislation applies in State waters in some instances, including in the regulation of export fisheries (see *Commercial Fishing*) and historic shipwrecks (see *Maritime Heritage*). In addition to Australian Government legislation and regulation (listed in various sections of this strategic framework) there are a number of national policies and agreements relevant to marine planning and management:

- Australia's Oceans Policy, released in 1998, which promotes the development of regional marine plans in all Australian jurisdictions;
- Marine Bioregional Planning for Commonwealth waters (see *Adjacent Waters*); and
- Offshore Constitutional Settlement (see *Adjacent Waters*).

Challenges and Opportunities
- The State, Local and Australian Governments all have marine responsibilities.
- A large number of acts, regulations and policies apply to marine and coastal planning and management.
- Lack of understanding within and outside Government of the roles and responsibilities of various levels of Government in marine planning and management.
- Historical lack of a regional planning framework for coordinated and strategic decision making in the marine south coast region.

Objective
- To integrate implementation of marine legislation, regulation and policy across all levels of Government.

No. C5.2	Proposed Strategies for Legislation and Policy	Responsibility for Initiation	Timing of Initiation
	General		
G1	Coordinate the integration on the south coast of State, Local and Commonwealth marine legislation, regulation and policy through a cross-sectoral Implementation Coordinating Group (see *Cooperation and Integration*).	ICG	Years 1-2
G2	Contribute to ongoing Government reviews of relevant legislation, regulations and policies through provision of a south coast perspective on matters such as the scope for changes to facilitate integrated decision-making and strengthen strategic planning.	ICG	Years 3-5
G3	Develop cross-sectoral approaches for particular geographic areas or issues on the south coast as required.	ICG	Underway (WAG, AG, Ind, NRMG, NGO)
G4	Encourage strategic environmental, economic and social assessment of proposals to reduce complexity and increase timeliness and clarity in strategic decision making processes in regional planning and management.	ICG	Years 3-5
G5	Raise awareness and understanding of the legislation, regulations and policies applying to marine planning and management.	ICG	Underway (WAG, AG)

C5.3 Administrative Frameworks

Context
The current administrative framework for marine issues is based on separate agencies dealing with sectoral issues, with interagency groups being formed for consultation and collaboration as required. One of the major aims of this strategic framework is to better integrate and coordinate the activities of the many organisations involved.

Numerous State Government agencies have a role in marine planning and management on the south coast including:
- Department of Fisheries;
- Department of Environment and Conservation;
- Environmental Protection Authority;
- Department of Mines and Petroleum;

- Department of State Development;
- Department of Planning;
- Department of Transport;
- Tourism Western Australia;
- Albany Port Authority;
- Esperance Port Authority;
- Department of Water;
- Department of Indigenous Affairs;
- Goldfields-Esperance Development Commission;
- Great Southern Development Commission;
- South West Development Commission; and
- Western Australian Museum.

Each agency is responsible for the implementation of legislation, policy and guidelines in its area of operation. Many other State Government agencies have responsibilities which directly influence marine environments and usage. The Australian Government also has administrative responsibilities in State waters and vice versa (see *Legislation and Policy* and *Adjacent Lands and Waters*).

State Government marine planning and management is administered through a combination of Statewide and spatially explicit legislation. For example, fisheries and charter boat operations are governed by Statewide legislation, while ports and marine reserves are spatially defined and have legislation which applies only within their boundaries. Uses governed under spatially explicit legislation can come into conflict at times.

Nine Local Government areas border the Western Australian south coast. From west to east these are:

- Shire of Augusta-Margaret River;
- Shire of Nannup;
- Shire of Manjimup;
- Shire of Denmark;
- City of Albany;
- Shire of Jerramungup;
- Shire of Ravensthorpe;
- Shire of Esperance; and
- Shire of Dundas.

Local authorities on the south coast do not have significant jurisdiction over marine waters. However, many decisions taken by Councils have a direct bearing on the marine environment and its uses and thus it is imperative that they be integrated into marine planning and management processes.

The various marine sectors also carry out planning and management of their activities under the guidance of legislation, policy and guidelines, as well as internal policies such as industry codes of practice. Project proponents can face complex approval processes in negotiating the many State, Local and Australian Government requirements. State Agreement Acts are used to ensure integration of legislation for complex development projects.

Natural resource management groups play a role in resourcing and coordinating marine resource planning and management through regional natural resource management strategies and investment plans. Three such groups operate on the south coast (see Figure 1):

- South West Catchments Council;
- South Coast Natural Resource Management; and
- Rangelands Natural Resource Management Coordinating Group.

Regional natural resource management planning and implementation seeks to integrate natural resource management activity across the three levels of Government, industry and community. When coordinated effectively, this work across the catchment to coast continuum can significantly benefit the marine environment, by reducing pollution to the ocean at a scale that is difficult for individual resource management sectors to achieve.

Challenges and Opportunities

- Administrative arrangements for marine planning and management are complex and largely uncoordinated at present.
- Regional Marine Planning offers an approach that aims to better integrate the activities of the many organisations and individuals involved with marine issues.

Objective

- To develop a coordinated and integrated administrative framework for marine planning and management.

No. C5.3	Proposed Strategies for Administrative Frameworks	Responsibility for Initiation	Timing of Initiation
	General		
G1	Coordinate administrative arrangements for marine planning and management through a cross-sectoral Implementation Coordinating Group (see *Cooperation and Integration*).	ICG	Years 1-2
G2	Incorporate this strategic framework in Government and natural resource management sector planning, management and reporting processes.	ICG	Years 1-2
G3	Incorporate this strategic framework in industry and sectoral planning and management.	ICG	Years 1-2
G4	Engage local authorities in relevant marine planning and management processes.	ICG	Underway (WAG)
G5	Develop performance monitoring and reporting processes for implementation of this strategic framework (see also *Monitoring and Review*).	ICG	Years 3-5
G6	Raise awareness and understanding among marine stakeholders and members of the public of the administrative processes used in marine planning and management.	ICG	Years 3-5
G7	Coordinate and integrate State and Commonwealth marine planning and management processes (see also *Legislation and Policy* and *Adjacent Waters*).	ICG	Underway (WAG, AG)

PART D

IMPLEMENTATION, MONITORING AND REVIEW

D1. IMPLEMENTATION

Context
Timeframes for initiating implementation of strategies have been nominated throughout this strategic framework.

Challenges and Opportunities
- Implementation of this strategic framework will require resources additional to those currently allocated to the planning and management of the south coast marine region.
- Coordinated effort will be required across all levels of Government, non-Government organisations, the commercial sector, marine stakeholders and members of the public to implement this strategic framework.
- Timeframes for implementation may change during the life of this document.
- Management of public expectation that all strategies in this document will be able to be resourced and implemented within a short time frame.
- Resources for framework implementation could be obtained from both Government and non-Government sources.
- Should significant changes to this strategic framework be required during the 10-year period of its currency, public comment on the proposed revisions should be sought.

Objectives
- To implement this strategic framework over the period of its currency (see *Monitoring and Review*).
- To deploy sufficient human, financial and logistical resources to enable implementation of the strategic framework over a 10-year period.

No. D1.	Proposed Strategies for Implementation	Responsibility for Initiation	Timing of Initiation
	General		
G1	Oversee implementation of this strategic framework and ensure integration of marine planning and management activities across all levels of Government, the commercial sector, marine stakeholders and members of the public through a cross-sectoral Implementation Coordinating Group (see *Cooperation and Integration*).	ICG	Years 1-2
G2	Seek resources for the implementation of this strategic framework from all available sources including State, Australian and Local Governments, the natural resource management sector, the commercial sector and granting bodies.	ICG	Years 1-2
G3	Allocate priorities to the strategies contained within this strategic framework.	ICG	Years 1-2
G4	Implement the management actions detailed in this strategic framework in order of priority, subject to availability of resources.	ICG	Years 1-2
G5	Involve marine stakeholders and members of the public in the development and review of priorities and make changes as required.	ICG	Years 3-5
G6	Involve marine stakeholders and members of the public in implementation of this strategic framework.	ICG	Years 1-2

D2. RELATIONSHIPS TO OTHER PLANNING

Context

Planning for the complex array of components of the south coast marine region has been traditionally conducted on a sectoral basis. Regional Marine Planning on the south coast aims to provide a framework which can assist more detailed sectoral planning.

Western Australian Government agencies and Statutory Authorities with marine responsibilities each have a range of existing statutory and non-statutory planning processes. This strategic framework complements (rather than duplicating or replacing) the existing legislative responsibilities and sectoral planning processes of individual agencies (see *The South Coast Regional Marine Planning Process*).

This strategic framework aims to complement Local Government planning processes by seeking to integrate these with planning and management of the marine environment (see *Coastal Development*). Consideration of the interrelationships of Town Planning Schemes, Local Authority Coastal Management Plans, other Local Authority planning policies and individual area plans with the marine environment will be facilitated through this strategic framework.

The Australian Government has been undertaking a Marine Bioregional Planning process for the South West Marine Region which encompasses all Commonwealth waters adjacent to the State waters of the south coast (see *Context for South Coast Regional Marine Planning* and *Adjacent Waters*). The South Australian Government has commenced a Regional Marine Planning process in State waters and in 2009, released provisional boundaries for 19 multiple-use marine parks for public comment. This strategic framework aims to complement Australian and South Australian Government processes.

The commercial sector conducts its own planning processes and while these are regulated by the three levels of Government, there is an opportunity to achieve early integration of such planning processes under the guidance of this strategic framework.

Challenges and Opportunities

- Implementation of the State, Australian and South Australian Government marine planning needs to be integrated to the greatest possible extent.
- The three regional natural resource management groups adjacent to the south coast marine region (South West, South Coast and Rangelands) each have in place a strategy incorporating planning and management of marine issues (see *Context for South Coast Regional Marine Planning* and *Administrative Frameworks*). These strategies are being progressively reviewed in the light of experience with their implementation.
- A document titled *Southern Shores 2009-2030: A strategy to guide coastal and marine planning and management in the south coast region of Western Australia* (see *Context for South Coast Regional Marine Planning*) was released in 2009 and specifically addresses the need for integration with this strategic framework.
- This strategic framework provides a mechanism for early integration of a wide range of marine planning processes.
- Integration with other planning processes will provide opportunities for joint resourcing of mutually compatible strategies.

Objectives

- To implement this strategic framework in a manner which complements and assists with other marine planning processes.
- To implement mutually compatible marine strategies in different planning documents through joint resourcing.

No. D2.	Proposed Strategies for Relationships to Other Planning	Responsibility for Initiation	Timing of Initiation
	General		
G1	Ensure integration of marine planning and management activities across all levels of Government, the commercial sector, marine stakeholders and members of the public through a cross-sectoral Implementation Coordinating Group (see *Cooperation and Integration*).	ICG	Years 1-2
G2	Work with the Australian and South Australian Governments to integrate implementation of this strategic framework with the related processes for adjacent waters.	ICG	Underway (WAG, AG, SAG)
G3	Coordinate stakeholder and broader public engagement processes in the implementation of State and Commonwealth marine planning processes for the south coast.	ICG	Years 1-2
G4	Use this strategic framework to assist in integrating marine planning and management by natural resource management groups.	ICG, NRMG	Years 1-2
G5	Seek opportunities for joint resourcing of mutually compatible marine strategies.	ICG, NRMG	Years 3-5
G6	Ensure implementation of *Southern Shores 2009-2030* is consistent with this strategic framework.	ICG, LGA, NRMG	Underway (WAG, NGO)

D3. MONITORING AND REVIEW

Context
This strategic framework will have effect for a period of 10 years. Progress with implementation of the strategic framework will require ongoing monitoring and review during its life and will be coordinated by a cross-sectoral Implementation Coordinating Group (see *Cooperation and Integration*).

Factors such as success of the strategies, scientific research advances and changes in community attitudes will be evaluated throughout the life of this strategic framework. The need for changes in approach will be assessed on the basis of the evaluation.

Challenges and Opportunities
- Circumstances may require adjustments to the strategies in this strategic framework during its tenure.
- The strategic framework will need to be reviewed after five years and fully revised at the end of its 10-year life.

Objective
- To implement this strategic framework while maintaining the currency of the approaches outlined in response to changing circumstances.

No. D3.	Proposed Strategies for Monitoring and Review	Responsibility for Initiation	Timing of Initiation
	General		
G1	Monitor the effectiveness of this strategic framework and use adaptive management approaches to adjust to changing circumstances.	ICG	Years 3-5
G2	Conduct an annual review of progress with implementation of this strategic framework and refine the implementation approach as required.	ICG	Years 1-2

G3	Engage marine stakeholders and members of the public in reviews of progress with implementation of this strategic framework and report publicly on the results.	ICG	Years 1-2
G4	Review both the approach outlined in this strategic framework and progress with its implementation after five years and plan continuing implementation over the second five-year period of its currency.	ICG	Years 3-5
G5	Seek public comment if significant changes to this strategic framework are required during the 10-year period of its currency.	ICG	Years 6-10
G6	Develop a revised strategic framework with full stakeholder engagement after 10 years.	ICG	Years 6-10

APPENDICES

APPENDIX 1 – Acronyms

AG	Australian Government
AO	Aboriginal Organisations
APA	Albany Port Authority
CSIRO	Commonwealth Science and Industrial Research Organisation
DEC	Western Australian Department of Environment and Conservation
DET	Western Australian Department of Education and Training
DIA	Western Australian Department of Indigenous Affairs
DoF	Western Australian Department of Fisheries
DoW	Western Australian Department of Water
DMP	Western Australian Department of Mines and Petroleum
DoP	Western Australian Department of Planning
DoT	Western Australian Department of Transport
DRDL	Western Australian Department of Regional Development and Lands
DSD	Western Australian Department of State Development
EPA	Western Australian Environmental Protection Authority
EsPA	Esperance Port Authority
FRDC	Fisheries Research and Development Corporation
GA	Geoscience Australia
ICG	Implementation Coordinating Group
IMCRA	Integrated Marine and Coastal Regionalisation of Australia
Ind	Industry
JASDGL	Joint Authority Southern Demersal Gillnet and Longline fishery
LGA	Local Government Authorities
MPRA	Marine Parks and Reserves Authority
NGO	Non-Government Organisations
NLWRA	National Land and Water Resource Audit
NRMG	Natural Resource Management Groups (SWCC, SCNRM, RNRMC)
OCC	Western Australian Office of Climate Change
PA	Port Authorities (APA, EsPA)
RNRMC	Rangelands Natural Resource Management Council Inc.
SAG	South Australian Government
SCNRM	South Coast Natural Resource Management Inc.
SEDO	Sustainable Energy Development Office
SSTs	Sea Surface Temperatures
SWCC	South West Catchments Council
TI	Tertiary Institutions
TWA	Tourism Western Australia
UWA	University of Western Australia
WA	Western Australia
WAG	Western Australian Government (including Local Government)
WAM	Western Australian Museum
WAMSI	Western Australian Marine Science Institution

APPENDIX 2 – Key Legislation and Policies

LEGISLATION

State Legislation

- *Aboriginal Heritage Act 1972*
- *Conservation and Land Management Act 1984*
- *Electricity Act 1945*
- *Electricity Industry (Western Australian Renewable Energy Targets) Amendment Bill 2005*
- *Energy Coordination Act 1994*
- *Environmental Protection Act 1986*
- *Fish Resources Management Act 1994*
- *Fisheries Adjustment Schemes Act 1987*
- *Fishing and Related Industries Compensation (Marine Reserves) Act 1997*
- *Harbours and Jetties Act 1928*
- *Jetties Act 1926*
- *Land Administration Act 1997*
- *Lights (Navigation Protection) Act 1938*
- *Local Governments Act 1995*
- *Marine and Harbours Act 1981*
- *Marine Navigational Aids Act 1973*
- *Maritime Archaeology Act 1973*
- *Mining Act 1978*
- *Mooring regulations*
- *Museum Act 1969*
- *Native Title (State Provisions) Act 1999*
- *Navigable Water Regulations 1958*
- *Occupier's Liability Act 1985*
- *Offshore Minerals Act 2003*
- *Petroleum (Submerged Lands) Act 1982*
- *Petroleum and Geothermal Energy Resource Act 1967*
- *Petroleum Pipelines Act 1969*
- *Planning and Development Act 2005*
- *Pollution of Waters By Oil and Noxious Substances Act 1987*
- *Port Authorities Act 1999*
- *Shipping and Pilotage Act 1967*
- *Soil and Land Conservation Act 1945*
- *Swan and Canning Rivers Management Act 2006*
- *Water Corporation Act 1995*
- *Waterways Conservation Act 1976*
- *Western Australian Marine (Sea Dumping) Act 1981*
- *Western Australian Marine Act 1982*
- *Wildlife Conservation Act 1950*

Commonwealth Legislation

- *Coastal Waters (State Powers) Act 1980*
- *Coastal Waters (State Title) Act 1980*
- *Environment Protection and Biodiversity Conservation Act 1999*
- *Environment Protection and Biodiversity Conservation Regulations 2000*
- *Environment Protection (Sea Dumping) Act 1981*
- *Fisheries Administration Act 1991*
- *Fisheries Management Act 1991*
- *Historic Shipwrecks Act 1976*
- *National Greenhouse and Energy Reporting Act 2007 (No. 175, 2007)*
- *Native Title Act 1993*
- *Natural Heritage Trust of Australia Act 1997*

- *Natural Resources Management (Financial Assistance) Act 1992*
- *Navigation Act 1912*
- *Navigation Amendment Act 1980*
- *Petroleum (Submerged Lands) Act 1982*
- *Petroleum (Submerged Lands) Amendment Act 1980*
- *Petroleum (Submerged Lands) (Management of Environment) Regulations 1999*
- *Protection of the Sea (Prevention of Pollution from Ships) Act 1983*
- *Protection of the Sea (Powers of Intervention) Act 1981*
- *Renewable Energy (Electricity) Act 2000*
- *Sea Installations Act 1987*
- *Seas and Submerged Lands Act 1973*

KEY POLICIES

State Policies

- Assessment of applications for authorisations for aquaculture and pearling in coastal waters of Western Australia, Ministerial Policy Guideline No. 8.
- Assessment of applications for the granting, renewal or transfer of fishing tour operators licences and aquatic eco-tourism operators licences, Ministerial Policy Guideline No. 12.
- Coastal protection policy for Western Australia.
- Commonwealth fisheries harvest strategy policy and guidelines.
- Development control policy 6.1 country coastal planning policy.
- Draft policy on the granting, renewal and regulation of aquaculture leases in Western Australia.
- Foreshore policy 1: identifying the foreshore area.
- Integrated fisheries management Government policy.
- Intergovernmental agreement on a national system for the prevention and management of marine pest incursions.
- Liberal Plan for Environmental Sustainability and Water Management.
- Mandatory renewable energy target overview.
- Policy for the implementation of ecologically sustainable development for fisheries and aquaculture in Western Australia.
- Statement of planning policy No. 2 environment and natural resources policy.
- Statement of planning policy No. 2.6 state coastal planning policy.
- Amendment to statement of planning policy No. 2 .6 state coastal planning policy.

Commonwealth Policies

- Australia's national programme of action for the protection of the marine environment from land-based activities 2006.
- Australia's ocean policy 1998.
- Australia's ocean policy: specific sectoral measures 1998.
- Australian and New Zealand guidelines for fresh and marine water quality 2000.
- Commonwealth coastal policy 1995.
- EPBC Act policy statement 2.1 - Interaction between offshore seismic exploration and whales.
- Heads of agreement on Commonwealth and State roles and responsibilities for the environment 1997.
- Intergovernmental agreement on the environment 1992.
- National cooperative approach to integrated coastal zone management 2006.
- National greenhouse strategy 1998.
- National objectives and targets for biodiversity conservation 2001–2005.
- National policy on fisheries bycatch 1999.
- National principles for the provision of water for ecosystems 1996.
- National representative system of marine protected areas 1999.
- National strategy for ecologically sustainable development 1992.
- National strategy for the conservation of Australia's biological diversity 1996.
- National water quality management strategy 1994.
- Securing Australians energy future 2004.

International Instruments

- Agreement for the protection of migratory birds and birds in danger of extinction and their environment between the Government of Australia and the Government of Japan 1974 (JAMBA)
- Basel convention on the control of transboundary movements of hazardous wastes and their disposal 1989.
- Convention for the conservation of southern blue fin tuna 1993.
- Convention for the suppression of unlawful acts against the safety of navigation 1988.
- Convention of the World Meteorological Organisation 1947.
- Convention on biological diversity 1993.
- Convention on conservation of migratory species of wild animals 1979 (Bonn Convention).
- Convention on facilitation of international maritime traffic 1965.
- Convention on international civil aviation 1944.
- Convention on international trade in endangered species of wild fauna and flora 1973 (CITES Convention).
- Convention on the International Maritime Organisation 1948 as amended
- Convention on the international regulations for preventing collisions at sea 1972.
- Convention on the prevention of marine pollution by dumping of wastes and other matter (London Convention) 1972.
- Convention on wetlands of international importance especially as waterfowl habitat (Ramsar) 1971.
- Declaration of the UN Conference on Environment and Development (Rio Declaration) 1992.
- Declaration of the UN Conference on the Human Environment 1972.
- Global programme of action for the protection of the marine environment from land-based activities 1995.
- International convention for the control and management of ships' ballast water and sediments 2004.
- International convention for the prevention of pollution from ships 1973.
- International Convention for the Control and Management of Ships' Ballast Water and Sediments 2004.
- International convention for the regulation of whaling 1946.
- International convention for the safety of life at sea 1974.
- International convention on civil liability for oil pollution damage 1992.
- International convention on load lines, 1966 and its protocol of 1988.
- International convention on maritime search and rescue 1979.
- International convention on oil pollution preparedness, response and co-operation 1990.
- International convention on salvage 1989.
- International convention on the establishment of an international fund for compensation for oil pollution damage 1992.
- International convention relating to intervention on the high seas in cases of oil pollution casualties 1969.
- Intervention convention and protocol relating to marine pollution other than oil 1973.
- Protocol for the suppression of unlawful acts against the safety of fixed platforms located on the continental shelf 1988.
- United Nations Conference on Environment and Development 1992 (Agenda 21).
- United Nations convention against illicit traffic in narcotic drugs and psychotropic substances 1988.
- United Nations convention on the law of the sea, 1982
- Conservation and management of straddling fish stocks and highly migratory fish stocks 1995.

APPENDIX 3 – Selected References

▪ PART A - INTRODUCTION

• A1 CONTEXT

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▪ PART B - MARINE VALUES

• B1 SOUTH COAST MARINE REGION

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APPENDIX 4 – References from Figures

The information presented within the maps in this document has been compiled through the South Coast Regional Marine Planning GIS and Resource Compilation project, funded by South Coast Natural Resource Management Inc. and the Department of Environment and Conservation, with funding contributions from the South West Catchments Council.

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Figure 1: WA south coast marine region and administrative boundaries

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APPENDIX 5 – Key Website Links

Australian and New Zealand Environment Conservation Council	http://www.environment.gov.au/about/councils/anzecc/index.html
Albany Port Authority	http://www.albanyport.com.au/
Aquaculture Council of Western Australia	http://www.aquaculturecouncilwa.com/
Australian Institute of Marine Science	http://www.aims.gov.au/
Australian Institute of Maritime Archaeology	http://aima.iinet.net.au/
Australian Legal Information Institute	http://www.austlii.edu.au/
Australian Marine Conservation Society	http://www.amcs.org.au/
Australian Marine Safety Authority	http://www.amsa.gov.au/
Australian Marine Sciences Association	http://www.amsa.asn.au/
Australian Petroleum Production and Exploration Association	http://www.appea.com.au/
Bureau of Meteorology	http://www.bom.gov.au/
Charter Boat Owners and Operators Association of Western Australia	http://www.charterboatswa.com.au/
City of Albany	http://www.albany.wa.gov.au/
Climate Change Australia	http://www.climatechange.com.au/
Coastwest	http://www.planning.wa.gov.au/Plans+and+policies/Statewide+planning/Coastwest/default.aspx
ComLaw	http://www.comlaw.gov.au/
Commonwealth Scientific and Industrial Research Organisation Marine and Atmospheric Research	http://www.cmar.csiro.au/
Conservation Council of Western Australia Inc.	http://www.conservationwa.asn.au/
Curriculum Council of Western Australia	http://www.curriculum.wa.edu.au/
Curtin University Centre for Marine Science and Technology	http://www.cmst.curtin.edu.au/
Department of Climate Change	http://www.climatechange.gov.au/
Department of Education and Training (Marine and Maritime Technology)	http://www.det.wa.edu.au/education/cmis/eval/curriculum/courses/marine/index.htm
Department of Environment and Conservation	http://www.dec.wa.gov.au/
Department of Fisheries	http://www.fish.wa.gov.au/
Department of Indigenous Affairs	http://www.dia.wa.gov.au/
Department of Local Government	http://.dlg.wa.gov.au/
Department of Planning	http://www.planning.wa.gov.au
Department of Mines and Petroleum	http://www.dmp.wa.gov.au
Department of the Premier and Cabinet	http://www.dpc.wa.gov.au/
Department of Regional Development and Lands	http://www.rdl.wa.gov.au
Department of State Development	http://www.dsd.wa.gov.au
Department of the Environment, Water, Heritage and the Arts (Marine Bioregional Planning)	http://www.environment.gov.au/coasts/mbp/index.html
Department of Transport	http://www.transport.wa.gov.au/
Department of Water	http://www.water.wa.gov.au
Ecotourism Australia	http://www.ecotourism.org.au/
Environmental Protection Authority	http://www.epa.wa.gov.au/
Esperance Port Authority	http://esperanceport.com.au/
Fire and Emergency Services Authority of Western Australia	http://www.fesa.wa.gov.au/
Goldfields Esperance Development Commission	http://www.gedc.wa.gov.au/
Great Southern Development Commission	http://www.gsdc.wa.gov.au/
Indian Ocean Climate Initiative (Climate change)	http://www.ioci.org.au/
Intergovernmental Panel on Climate Change	http://www.ipcc.ch/
Marine and Coastal Community Network	http://www.mccn.org.au/
Marine Education Society of Australia	http://www.mesa.edu.au/
National Aquaculture Council	http://www.australian-aquacultureportal.com/nac/contact.html
National Maritime Safety Committee	http://www.nmsc.gov.au/
Nautical Archaeological Society of the UK	http://www.nasportsmouth.org.uk/

Office of Climate Change	http://www.dec.wa.gov.au/content/view/3435/2186/
Office of Energy	http://www.energy.wa.gov.au/
OzCoast and OzEstuaries	http://www.ozcoasts.org.au/
Primary Industries Ministerial Council and Natural Resource Management Ministerial Council	http://www.mincos.gov.au/home
Rangelands NRM Co-ordinating Group	http://www.rangelandswa.info/
Recfishwest	http://www.recfishwest.org.au/
Recreational Fishing Advisory Committee	http://www.fish.wa.gov.au/docs/macs/rfac/index.php?0001
Regional Marine Planning	http://rmp.dec.wa.gov.au/
Royal Life Saving Society Australia	http://www.royallifesaving.com.au/
Shire of Augusta-Margaret River	http://www.amrsc.wa.gov.au/
Shire of Denmark	http://www.denmark.wa.gov.au/
Shire of Dundas	http://www.dundas.wa.gov.au/
Shire of Esperance	http://www.esperance.wa.gov.au/
Shire of Jerramungup	http://www.jerramungup.wa.gov.au/
Shire of Manjimup	http://www.manjimup.wa.gov.au/
Shire of Nannup	http://www.nannup.wa.gov.au/
Shire of Ravensthorpe	http://www.ravensthorpe.wa.gov.au/
South Australia Department for Environment and Heritage	http://www.environment.sa.gov.au/coasts/index.html
South Coast Natural Resource Management Inc	http://www.southcoastnrm.com.au/
South West Catchments Council	http://www.swcatchmentscouncil.com/
South West Development Commission	http://www.swdc.wa.gov.au/
State Law Publisher	http://www.slp.wa.gov.au/Index.html
Surf Life Saving Australia	http://www.slsa.asn.au/
Sustainable Energy Development Office	http://www.sedo.energy.wa.gov.au
Sustainable Tourism Cooperative Research Centre	http://www.crctourism.com.au/default.aspx
The Climate Institute	http://www.climateinstitute.org.au/
Tourism Accreditation Australia Ltd	http://www.tourismaccreditation.org.au/
Tourism Council of Western Australia	http://www.tourismcouncilwa.com.au/site/
Tourism Western Australia	http://www.tourism.wa.gov.au/
Western Australian Maritime Museum	http://www.museum.wa.gov.au/maritime/
Water Corporation	http://www.watercorporation.com.au/
Western Australian Fishing Industry Council	http://www.wafic.org.au/
Western Australian Marine Science Institution	http://www.wamsi.org.au/
Western Australian Museum	http://www.museum.wa.gov.au/
Western Power	http://www.westernpower.com.au

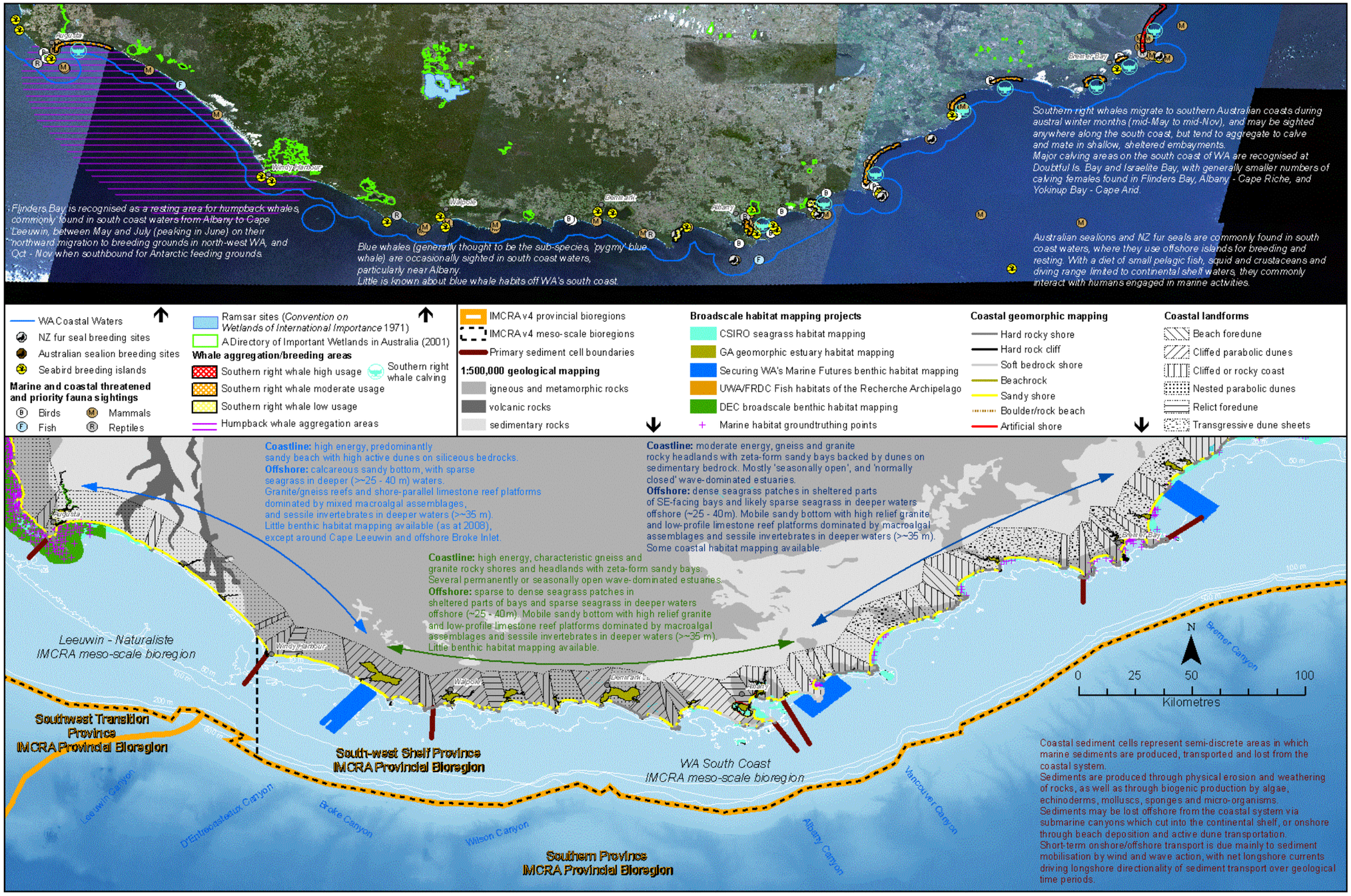

Figure 20: South coast marine environmental values - Augusta to Bremer Bay

For map source information, see Appendix 4

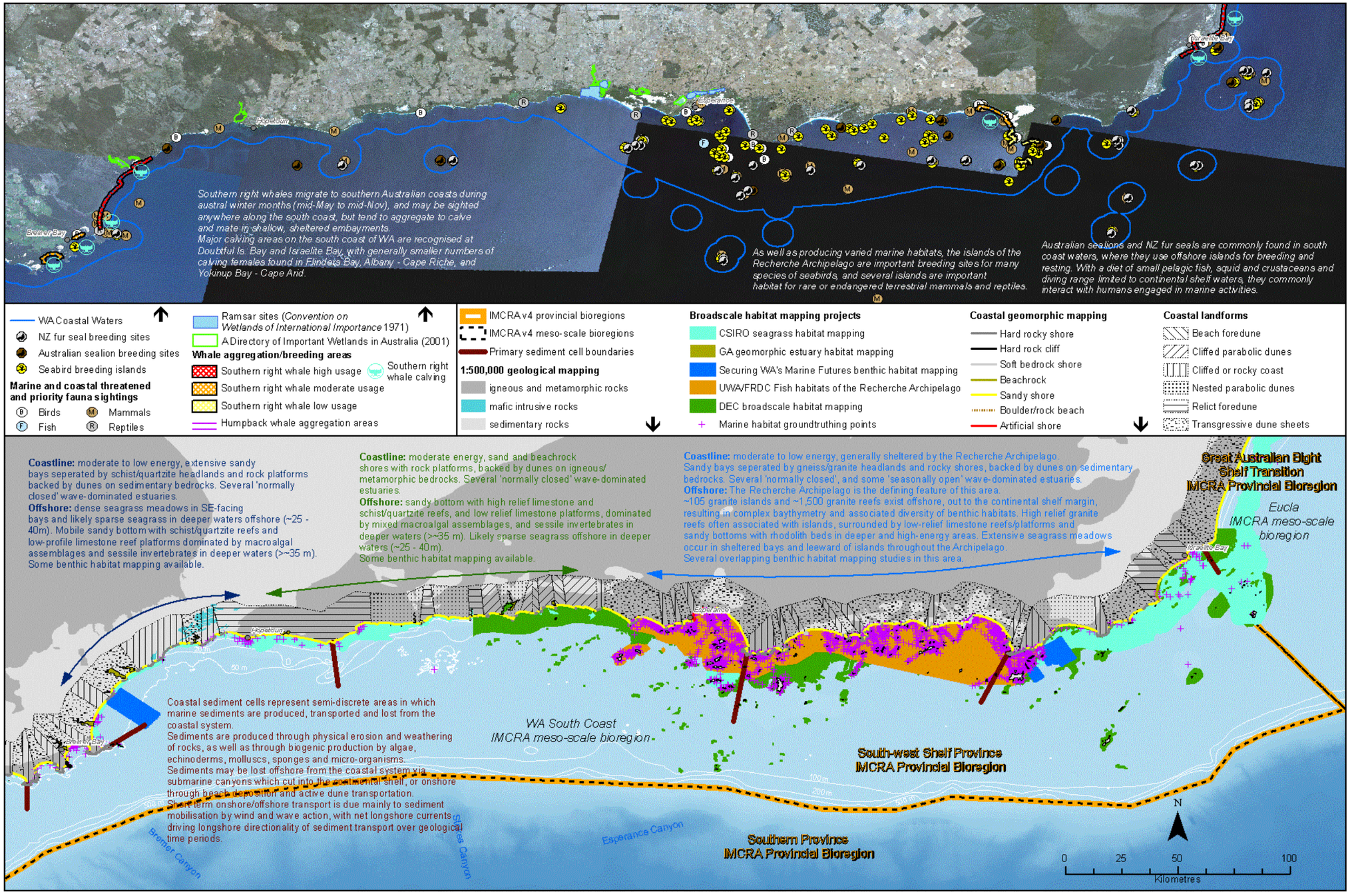

Figure 21: South coast marine environmental values - Bremer Bay to Israelite Bay

For map source information, see Appendix 4

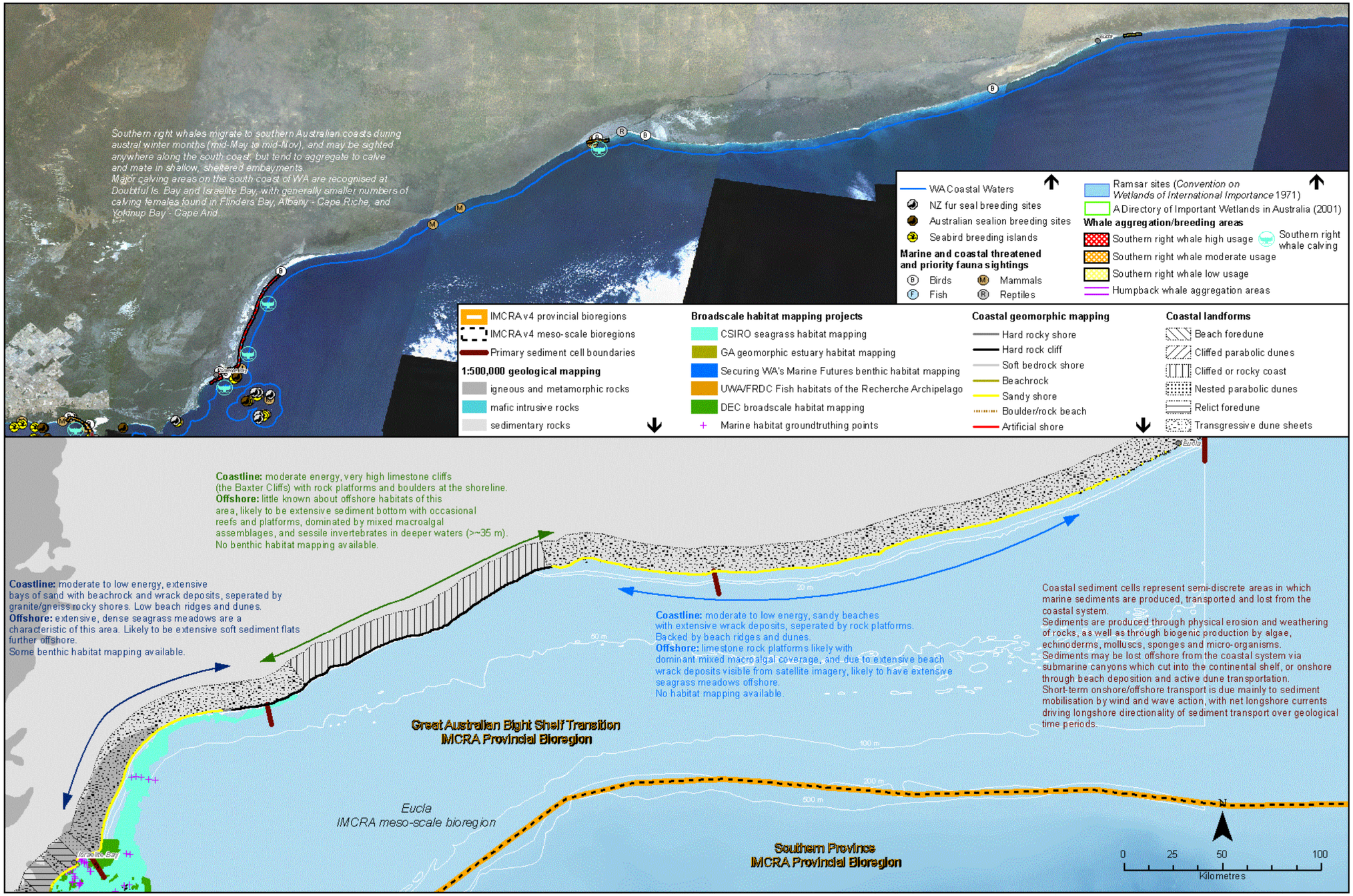

Figure 22: South coast marine environmental values - Israelite Bay to Eucla

For map source information, see Appendix 4