

# Living Coast Strategy for South Australia



2004



Government  
of South Australia

Prepared by Natural and  
Cultural Heritage  
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Front Cover (clockwise): Leafy Seadragon  
(*Phycodurus eques*) (Marine Life Society of SA);  
Oyster farm (PIRSA); Reefwatch diver  
(G Adams, The Advertiser); Child on beach  
(DEH); North Haven Marina (A Eaton, CPB);  
and Beach fisher (P Canty).

Back cover: Nullabor Cliffs; Zoanthids (*Zoanthus  
robustus*), Baudin Rocks Conservation Park  
(D Muirhead, Marine Life Society of SA).

## LIVING COAST STRATEGY - FOREWORD

South Australia's unique coastal, estuarine and marine environments are a precious resource. Our marine and estuarine waters are some of the most biologically diverse in the world. They support fisheries and aquaculture as well as huge populations of migratory birds, tourism, recreation and mining - all important to the South Australian economy. With more than 90 per cent of South Australians living on or near the coast and so many people working on the coast or visiting it, we are in danger of 'loving it to death'. Our coastal waters are under pressure from development and overuse, pollution and the introduction of pest species.

The *Living Coast Strategy* is a plan to preserve our coast - its land, its water, its valuable ecosystem - for many years into the future.

The *Living Coast strategy* will support the:

- sustainability of coastal, estuarine and marine environments along with their natural resources and cultural heritage;
- reduction of land-based and marine pollution;
- better development control over the whole coastal environment;
- security for small business and regional economies by providing a sustainable base for fishing, tourism and recreation;
- partnerships with the community.

For this Strategy to be successful, all levels of Government, industry and the community need to share responsibility for the management and protection of our coast. The protection of marine biodiversity is also included in the State Strategic Plan, with a target of establishing 19 multiple-use Marine Protected Areas by 2010.

The State Government is pleased to present the *Living Coast Strategy* to you.



The Hon. Mike Rann, MP  
Premier of South Australia



The Hon. John Hill, MP  
Minister for Environment and Conservation



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Premier of South Australia



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Child on beach (DEH); Walking along the boardwalk, Seal Bay, Kangaroo Island (SATC); Underwater algae community dominated by *Ecklonia radiata*, near Granite Island (A. Melville, University of Adelaide); Lighthouse at Cape du Couedic, Flinders Chase National Park (S. Barker).

## CONTENTS

FOREWORD.....	1
EXECUTIVE SUMMARY.....	4
SIGNIFICANCE OF SOUTH AUSTRALIA'S COASTAL, ESTUARINE AND MARINE ENVIRONMENTS .....	13
KEY CHALLENGES.....	14
THE STRATEGY .....	16
Goal .....	17
Guiding Principles .....	17
Objectives.....	17
ACHIEVING OUR OBJECTIVES.....	18
OBJECTIVE 1. TO PROVIDE A LEGISLATIVE AND POLICY FRAMEWORK FOR ECOLOGICALLY SUSTAINABLE DEVELOPMENT AND USE OF OUR COASTAL, ESTUARINE AND MARINE ENVIRONMENTS .....	18
STRATEGIES	
1.1 Develop and Implement New Coast and Marine Legislation .....	18
1.2 Develop a Marine Planning Framework.....	19
1.3 Ensure Linkages with the Planning Strategy for South Australia and State Natural Resource Management Plan .....	19
1.4 Develop an Estuaries Policy .....	20
1.5 Facilitate Integration of Coastal, Estuarine and Marine Resource Management Legislation.....	21
1.5.1 Crown Lands.....	21
1.5.2 Aquaculture.....	22
1.5.3 Fisheries .....	22
1.5.4 Mineral and Petroleum Exploration.....	23
1.5.5 Environment Protection.....	24
1.5.6 Native Vegetation.....	24
1.5.7 Heritage .....	24
1.5.8 Native Title .....	24
1.5.9 Development.....	25
1.5.10 Harbors and Navigation .....	25
1.5.11 Tourism.....	26
1.5.12 Coast Protection .....	26
1.6 Maintain Effective Inter-Governmental Relations.....	27
OBJECTIVE 2. TO CONSERVE AND SAFEGUARD THE NATURAL AND CULTURAL HERITAGE OF OUR COASTAL, ESTUARINE AND MARINE ENVIRONMENTS .....	28
STRATEGIES	
2.1 Establish Effective Conservation Strategies.....	29
2.1.1 Develop and Implement Marine Plans.....	29
2.1.2 Establish Marine Protected Areas.....	29
2.1.3 Establish the Adelaide Dolphin Sanctuary.....	30
2.1.4 Improve Protection of Threatened and Rare Species.....	31
2.1.5 Develop NatureLinks.....	31
2.1.6 Protect Fish Breeding Grounds.....	31
2.1.7 Protect Estuarine Habitats.....	32
2.1.8 Protect and Manage Coastal Wetlands .....	32
2.1.9 Protect Significant Coastal Habitats .....	32
2.2 Provide Formal Legislative Protection .....	33
2.2.1 Develop and Implement New Biodiversity Legislation .....	34
2.3 Rehabilitate Degraded Habitat .....	34
2.4 Mitigate and Manage Invasive Species.....	34
2.4.1 Manage Coastal Pest Plants.....	34
2.4.2 Manage Marine Pest Species and Aquatic Animal Disease Emergencies .....	35
2.5 Protect Indigenous Heritage.....	37
2.5.1 Maintain Effective Partnerships with Indigenous Communities.....	37
2.5.2 Facilitate Compliance with Relevant Indigenous Heritage Legislation .....	38
2.6 Protect European Heritage.....	38
2.6.1 Protect Maritime Heritage Assets .....	38
2.6.2 Improve Public Awareness of Maritime Heritage .....	39

OBJECTIVE 3. TO CONTROL POLLUTION OF OUR COASTAL, ESTUARINE AND MARINE ENVIRONMENTS .....40  
 STRATEGIES  
 3.1 Conduct Risk Assessments.....40  
 3.2 Reduce Land-Source Pollution.....41  
 3.3 Minimise Marine Pollution .....42  
     3.3.1 Improve Environmental Management of Aquaculture .....42  
     3.3.2 Manage Ballast Water and Oil Spills .....43  
     3.3.3 Control Sea Dumping.....45  
     3.3.4 Control Dredging .....45

OBJECTIVE 4. TO PROTECT OUR COASTAL, ESTUARINE AND MARINE ENVIRONMENTAL ASSETS .....46  
 STRATEGIES  
 4.1 Develop a Strategic Vision for Coastal Development.....46  
 4.2 Protect Coastal Assets .....47  
 4.3 Establish Effective Development Controls.....49  
 4.4 Establish Effective Management of Coastal Lands.....50

OBJECTIVE 5. TO IMPROVE UNDERSTANDING OF OUR COASTAL, ESTUARINE AND MARINE ENVIRONMENTS.....51  
 STRATEGIES  
 5.1 Increase Knowledge to Inform Decision-Making.....51  
 5.2 Monitor and Share Information.....53  
 5.3 Raise Community Awareness and Education .....54

OBJECTIVE 6. TO DEVELOP AND MAINTAIN PARTNERSHIPS BETWEEN STATE AND LOCAL GOVERNMENTS, COMMUNITY AND INDUSTRY .....57  
 STRATEGIES  
 6.1 Establish Management Responsibilities Between State and Local Government .....57  
 6.2 Maintain Partnerships and Joint Responsibility .....57  
 6.3 Promote Support and Ownership Across the Community.....58

IMPLEMENTATION .....59

ABBREVIATIONS .....60

GLOSSARY .....61

APPENDIX 1: Ecologically Sustainable Development .....63

APPENDIX 2: List of International Treaty Obligations.....64  
 List of National Obligations .....64  
 List of South Australian Coast and Marine Legislation .....65

APPENDIX 3: A National Cooperative Approach to Integrated Coastal Cone Management .....66

APPENDIX 4: Responsibility for Actions .....70



Barcoo Outlet (EPA); Sand management on the Adelaide metropolitan coast (A Eaton, CPB); Wreck of the SS Australian, a feature of the Wardang Island Maritime Heritage Trail (B Jeffery, DEH); Head of Bight meeting (Yalata Land Management).



The marine and estuarine waters of South Australia have high biological diversity.

A range of habitats is evident, from warm salty waters in the gulfs to cool-water kelp forests in the south-east, from the low productivity waters of the Great Australian Bight to the nutrient rich upwellings of the south-east.

These waters support more than 6000 invertebrates, 1200 algae, 350 fish species, 16 breeding seabird species, 33 mammal species and 12 seagrass species. In the Southern Ocean, 75 per cent of the red algae, 85 per cent of the fish species and 95 per cent of the seagrasses are found nowhere else in the world, giving them local, national and international significance.

Leafy Seadragon (*Phycodurus eques*)  
(Marine Life Society of SA).

## EXECUTIVE SUMMARY

The *Living Coast Strategy* sets out the State Government's environmental policy directions for sustainable management of South Australia's coastal, estuarine and marine environments. While it focuses on promoting environmental stewardship, the Strategy also supports development of industries operating within sustainable frameworks.

## SIGNIFICANCE OF COASTAL, ESTUARINE AND MARINE ENVIRONMENTS

South Australia's coastline and offshore waters have significant environmental, economic, social, and cultural values.

Our coast supports a wide variety of ecosystems through a mixture of sheltered water, within Gulfs and embayments, and open ocean coast. Our marine and estuarine waters, with their high levels of endemism, represent some of the most biologically diverse waters in Australia and the world. South Australia has 24 coastal wetlands that regularly support significant populations of migratory birds of international conservation significance.

Our coastal, estuarine and marine environments also represent a highly valuable resource for both State and regional economies, supporting a wide range of activities including:

- recreation;
- tourism and marine-based industries;
- urban development;
- commercial fisheries and aquaculture;
- recreational and charter fishing;
- shipping and transportation;
- coastal agriculture;
- mining;
- manufacturing and trade; and
- science and education.

In particular, fishing (both commercial and recreational) and aquaculture industries are becoming increasingly important to the State.

With more than 90 per cent of South Australians living on or near the coast, socially and culturally the coast and marine environment is valued for its recreational opportunities, amenity, tourism potential, rich cultural heritage, conservation and scientific significance.

## KEY CHALLENGES

The integrity of South Australia's coastal, estuarine and marine environments are under significant pressure from development and use, pollution and the introduction of pest species. Continuing pressure on the coast for the development of housing, industry and support infrastructure is having cumulative impacts on coastal systems and amenity values. We must deal effectively with these pressures to ensure ongoing opportunities for marine industry development, tourism, recreation and biodiversity conservation.

South Australia has a high level of endemism, but our knowledge of marine environments and the impacts arising from our use of these environments, is extremely limited. All users have a responsibility to improve our understanding of these environments.

Strategic planning and integrated management is needed for the long-term conservation, development and productivity of these environments. There is a need for adequate environmental and planning frameworks to manage the increasing and often competing demands on coastal, estuarine and marine environments.

## THE STRATEGY

The *Living Coast Strategy* addresses the Government's environmental policy commitments for coastal, estuarine and marine environments. It encompasses a range of environmental initiatives and programs and sets out the policy directions that the State Government will be taking over the next five years to help protect and manage South Australia's coastal areas, estuaries and marine ecosystems for their conservation and sustainable use.

The following **principles** will guide the sustainable use of South Australia's coastal, estuarine and marine environments:

- coastal, estuarine and marine environments are a valuable and common resource;
- Ecologically Sustainable Development is fundamental to the long-term conservation and productivity of coastal, estuarine and marine environments;
- ecosystem-based management is essential to achieve conservation and Ecologically Sustainable Development;
- the conservation of biological diversity and protection of ecological integrity, supported by a precautionary approach to avoid threats of serious or irreversible environmental damage, are critical to decision-making;
- the economic benefits derived by the State from the use of coastal, estuarine and marine resources are recognised;
- indigenous cultural values of our coastal, estuarine and marine environments are fundamental;
- community involvement is essential for balanced and transparent decision-making; and
- actions are consistent with South Australia's obligations under domestic inter-governmental agreements, international treaties and conventions to which Australia is a signatory.

The *Living Coast Strategy* identifies and addresses six key **objectives** for our coastal, estuarine and marine environments. A number of actions for State Government and lead agencies are also identified.



Northhaven Marina (A Eaton, CPB).



## **OBJECTIVE 1. TO PROVIDE A LEGISLATIVE AND POLICY FRAMEWORK FOR ECOLOGICALLY SUSTAINABLE DEVELOPMENT AND USE OF OUR COASTAL, ESTUARINE AND MARINE ENVIRONMENTS**

Planning, resource allocation and control of activities in coastal, estuarine and marine environments are achieved through legislation administered by State and local government agencies. Whilst existing legislation generally addresses environmentally sound principles, without integration there is an increasing risk of sectoral interests addressing immediate needs to the detriment of overall community interests and long-term benefits.

One of the Government's major actions is the development of a Marine Planning Framework for the protection and sustainable use of coastal areas, estuaries and the marine environment. Marine Plans, covering the eight marine bioregions across State waters, will establish zones based on particular environmental values and set goals, objectives and strategies to ensure activities are compatible with the ecological values of each zone.

The objectives and strategies from these Marine Plans will be reflected in the *Planning Strategy for South Australia* reinforcing the role of the Planning Strategy in the coastal and marine zone.

Another significant action is the development of a Coast and Marine Act to replace the *Coast Protection Act 1972*. This Act will reinforce integrated planning and sustainable use of coastal, estuarine and marine environments and ensure their use and development is consistent with the principles of Ecologically Sustainable Development. The Act will facilitate informed decision-making across jurisdictions based on sound knowledge and understanding of South Australia's coastal and marine ecosystems. It will also provide the statutory basis for Marine Plans. The Act will also establish a Coastal and Marine Authority.

Other major actions discussed in this section include the development of an Estuaries Policy to provide clear direction for the sustainable use and conservation of estuaries and amendments to resource management legislation to ensure planning and actions are consistent with Marine Plans and the *Planning Strategy for South Australia*.

## **OBJECTIVE 2. TO CONSERVE AND SAFEGUARD THE NATURAL AND CULTURAL HERITAGE OF OUR COASTAL, ESTUARINE AND MARINE ENVIRONMENTS**

### *Natural Heritage*

The South Australian coastline and adjacent seas are recognised internationally as having great biodiversity value with very high levels of endemism. However, improved understanding of local species and ecosystems is required to ensure their continued protection. Greater representation of coastal and marine habitats, species assemblages and individual species is also required in areas protected and managed for biodiversity conservation.

Assessment of the ecological significance of coastal, estuarine and marine habitats and the status of the State's management arrangements for these habitats will ensure that efforts are directed toward adequate protection of the State's species and ecosystems. The process for regularly reviewing and assessing the ecological status of coastal, estuarine and marine environments through the Government's State of Environment (SoE) Reporting will be improved.

Major Government initiatives for protecting our natural heritage include the development of Marine Plans and establishing a representative system of multi-use Marine Protected Areas (MPAs). A proposed dolphin sanctuary in the Port River and Barker Inlet will improve protection for the dolphins and the quality of this environment.

The Government is committed to a *No Species Loss Strategy* for South Australia that will

Seal Bay Conservation Park (DEH).

provide additional protection for threatened marine species, some of which are protected under national and international obligations. A list of threatened, rare and vulnerable marine species for legislative protection will be developed. South Australia will cooperate with the Commonwealth and other States to develop and implement threatened species recovery plans for priority species.

The designation of significant coastal wetlands as Shorebird Sites of International Importance (on the East Asian-Australasian Shorebird Site Network) will be investigated by the Government. Operational policies and management plans will be prepared for priority coastal, estuarine and marine wetlands in South Australia.

The Government is also investigating a proposal for a Biodiversity Conservation Act for South Australia and a *State Biodiversity Strategy*, which encompass coastal, estuarine and marine environments. The *State Biodiversity Strategy* will identify the management, research and monitoring policies required to protect South Australia's coastal, estuarine and marine habitats.

The State Natural Resource Management Plan under the proposed *Natural Resources Management Act* will address the coastal, estuarine and marine environments.

Some pest species have already established themselves along South Australia's coastline and represent a significant threat to coastal biodiversity. A strategy is being formulated to manage the spread of coastal pest plants and to prevent new species from establishing.

The risks and consequences of marine pest incursions can be catastrophic for biodiversity conservation, fisheries and aquaculture. The risk can be minimised through effective barrier control, detection and response, and monitoring and management of existing pest species. The South Australian Government is committed to the Australian Ballast Water Management Strategy at the State level and supports the development of Port Management Plans, which should assist in the early detection of introduced marine pests.

The State Response Plan for managing aquatic animal diseases will be revised to include a greater number of species in surveillance programs and to support research to identify and control pathogens of aquatic animals including those under aquaculture. Local response plans based on the National Introduced Marine Pest Response Plan and local emergency management practices will be formalised.

#### *Indigenous Heritage*

The Government will work to ensure compliance with the *Aboriginal Heritage Act 1988* and to promote best practice in conserving indigenous heritage in coastal and marine environments.

Strong working relationships with relevant indigenous communities and heritage committees will be established and maintained to support to the protection of significant sites.

#### *Non-indigenous Heritage*

It is important to maintain the values of maritime heritage places. The Government will continue to encourage the conservation of the State's maritime buildings, structures and sites, and is committed to ensuring linkages between actions in State and Commonwealth waters and compliance with the provisions of both State and Commonwealth historic shipwreck legislation.



Sea Star (P. Canty).



### OBJECTIVE 3. TO CONTROL POLLUTION OF OUR COASTAL, ESTUARINE AND MARINE ENVIRONMENTS

Pollution affects the water quality, habitat health and biodiversity of coastal, estuarine and marine environments. The impacts of pollution on commercial and recreational fishing are a serious concern. Pollutants also diminish the recreational and amenity values of the coastal waters. There is a need for close planning and operational linkages between coastal and inland water management agencies to address diffuse pollution sources.

A comprehensive risk assessment is required to identify and prioritise pollution risks to coastal, estuarine and marine environments to ensure effective management, remediation. The Adelaide Coastal Waters Study will provide new knowledge and understanding of chemical, physical and biological processes to support sustainable management options. It will identify key threatening processes and options to minimise impacts.

The Government is also committed to reducing land-based point and diffuse source pollution and exploring innovative wastewater reuse to protect estuarine and marine water quality. SA Water is undertaking statutory Environment Improvement Programs (EIPs) that involve upgrading wastewater treatment plants to minimise high nutrient discharges into the marine environment.

The Government will increase the use of recycled effluent and reduce marine discharges through continuing partnerships with local government, CSIRO and industry. Catchment Water Management Boards, Regional Natural Resource Management Boards and local government will be actively encouraged to develop integrated water quality and stormwater management strategies, including beneficial re-use programs to minimise discharge into the marine environment. Increasing emphasis is required on whole-of-catchment management involving local communities and on-property use or disposal of waters.

In addition, the Government will be developing Codes of Practice linked to the *Environment Protection (Water Quality) Policy* to address the management of diffuse pollution sources and improve the quality of stormwater discharging into the coastal, estuarine and marine environments.

Investigations into the environmental impacts of aquaculture activities will continue. The Government will ensure environmental considerations are paramount in assessing new aquaculture ventures.

The Government is committed to implementing the Australian Ballast Water Management Guidelines to reduce the risk of marine shipping incidents and pollution events in South Australia's ports and in State waters. Implementation will be in conjunction with the Commonwealth, States and New Zealand.

The Inter-governmental Agreement on the National Plan to Combat Pollution of the Sea by Oil and Other Noxious Substances 2002, includes the process for recovering clean-up costs from the polluter. The Government is committed to ensuring that all costs from oil spills, including environmental rehabilitation and monitoring, are met by those responsible.

The South Australian *Environment Protection (Sea Dumping) Act*, which was passed by Parliament in 1984 to mirror Commonwealth legislation, has not been proclaimed. Therefore, the regulation of sea dumping in coastal waters currently rests with the Commonwealth. The Environment Protection Authority (EPA) is currently reviewing the South Australian Act to align it, with subsequent modifications, to the Commonwealth's sea dumping legislation. The Government will negotiate with the Commonwealth to bring 'coastal waters' within the control of the South Australian Government by demonstrating compliance with the London Protocol.

Tanker at Port Adelaide,  
Australian Bulk Handling (EPA).

#### **OBJECTIVE 4. TO PROTECT OUR COASTAL, ESTUARINE AND MARINE ENVIRONMENTAL ASSETS**

South Australia has a history of coastal development resulting in major habitat loss, particularly of coastal wetlands, dune systems and seagrass communities. Developments too close to the shoreline along the metropolitan coast have caused seagrass loss with significant ecological and economic consequences. The loss of seagrass has exacerbated the natural process of beach erosion, which has resulted in the need for sand replenishment and engineering works along the coast.

Coastal development is subject to the hazards of flooding, erosion and acid sulfate soils. The level of risk will change over time, in part as a response to climate change (global sea level rise and the increased magnitude and frequency of extreme events, such as storm surge) and part from natural uplifting and subsidence of land.

There are significant problems for dunes and beaches where development and land division occurs in a linear fashion along the coast. This pattern of development requires high protection costs to prevent coastal erosion and flooding and also affects public access to beaches. It is therefore important to manage existing development and prevent further inappropriate coastal development. Resolving these issues must be a joint responsibility for State and local governments as well as the community.

The *Living Coast Strategy* proposes the development of a clear, strategic vision for the State on coastal planning and development. The vision, to be developed in conjunction with local government and the Commonwealth, will provide policy directions and principles addressing a range of coastal land management aspects including view scapes, significant ecosystems, coastal hazards, sea level rise, public access, indigenous and non-indigenous heritage values and linkages with the marine environment.

Ongoing monitoring of physical change to the coastal environment is critical to identify coastal hazards and enable remediation of any impacts. High-risk areas will be identified and used to guide planning, development and protection in conjunction with local government. State and local governments will work with owners of at-risk properties to develop coast protection strategies and identifying funding sources.

Effective control is fundamental to prevent and manage inappropriate coastal development. In particular, greater controls are needed to govern rebuilding in coastal hazard areas.

The Government is committed to proposed amendments to the *Crown Lands Act 1929*, which provide for single ministerial responsibility for care control and management of Crown lands and improve administration and management of marine, coastal and river front Crown holdings.

The proposed Natural Resource Management (NRM) legislation will ensure strategic and integrated management and use of coastal lands.

The *South Australian Tourism Plan 2003-2008* identifies strategies to develop integrated coastal experiences predicated on the values of sustainability, innovation and the appreciation of coastal environments. The Government is committed to implementing an environmentally responsible framework for coastal and marine tourism development. Individual Users' Codes of Conduct will be required to encourage the adoption of environmentally friendly and safety conscious behaviour in State waters and to promote sensitive and responsible use of marine and coastal environments.



Zoanthids (*Zoanthus robustus*),  
Baudin Rocks Conservation Park  
(D Muirhead, Marine Life Society of SA).



Spinifex sericeus (P. Canty).

## OBJECTIVE 5. TO IMPROVE UNDERSTANDING OF OUR COASTAL, ESTUARINE AND MARINE ENVIRONMENTS

Knowledge of our coastal, estuarine and marine habitats and species, ecosystems, bio- and geo-physical systems and processes is very incomplete. The sustainable management of South Australian aquatic habitats and resources is critically dependent upon the continued development and application of our knowledge about the structure and function of these ecosystems. The sustainable use of these resources underpins the generation of wealth for regional, State and national communities and industries.

Understanding local impacts on the coastal, estuarine and marine environments from all uses is also necessary. This includes monitoring and mapping coastal and marine biological and physical environments.

Successful delivery of the Government's marine conservation programs relies on access to best available ecological, geological and oceanographical information at scales appropriate to conservation planning.

The systematic identification and description of species and ecosystems, and the review and understanding of threatening processes underpins decision-making for the ecologically sustainable use of coastal, estuarine and marine environments.

The Government is committed to increasing understanding of ecological processes and ecosystems in coastal, estuarine and marine environments to enable planning and decision-making to be supported by a sound information base. Research must be coupled with longer-term monitoring programs about the health of these environments.

Currently, the deployment of research and development capabilities is strongly influenced by cost-recovery arrangements with industry. There is a lack of resources to address fundamental questions in relation to the management of the broader coast and marine environment. There is a need for a long-term strategy to fund integrated research programs to support the broader management and planning agenda for the State's marine and coastal environments.

The Government has recently launched the Marine Innovation SA (MISA) proposal in conjunction with Flinders University, the University of Adelaide and the South Australian Museum. MISA is an initiative for the ecologically sustainable development of South Australia's fisheries, aquaculture and marine eco-tourism industries and to ensure the knowledge base to conserve and protect the natural resources, habitats and environments on which these industries rely.

The Government is committed to identifying indicators and assessment methodologies to enable effective monitoring and reporting of the ecological, social and economic changes in the coast, estuarine and marine environment for SoE Reporting. The South Australian Representative System of Marine Protected Areas (SARSMIPA) Program incorporates explicit objectives to monitor and assess the performance of protected areas.

The Government is committed to engaging non-government organisations and the broader community in marine ecosystem monitoring programs, such as 'Reef Watch' and 'Feral or in Peril', in South Australian waters.

The *Living Coast Strategy* proposes the investigation of an integrated system for the management and access of coastal and marine data collected by agencies and organisations.

Community understanding and support is crucial to the success of the *Living Coast Strategy*. The Government is committed to supporting the Coast and Marine Education Framework to encourage responsibility and effective stewardship of the marine environment through education. An explicit objective of the Government's marine conservation programs is the delivery of enhanced community awareness and education regarding the importance of conservation and the delivery of the principles of Ecologically Sustainable Development within the marine environment.

**OBJECTIVE 6. TO DEVELOP AND MAINTAIN PARTNERSHIPS BETWEEN STATE AND LOCAL GOVERNMENTS, COMMUNITY AND INDUSTRY**

Local government and the community are stakeholders in the protection and management of coastal, estuarine and marine environments. Local government, in particular, is a key player in coastal management in South Australia.

The significance of allocating management responsibilities equitably between local and State governments is recognised. These responsibilities include coast protection, land management, stormwater management and maintenance of coastal biodiversity as well as identifying cost-sharing arrangements. It is proposed that management and funding responsibilities will be reviewed during the development of the proposed Coast and Marine Act.

Once agreement is reached on allocation of responsibilities, support South Australian coastal councils in exercising their responsibilities through regional and local coastal strategies to guide management of the coastal areas in their jurisdictions.

The Government is committed to encouraging community and industry involvement in decision-making on local marine issues to facilitate a greater sense of responsibility, understanding and 'ownership' of marine environment decisions. As a result of several initiatives such as the Spencer Gulf Marine Plan, the Marine Protected Areas program and the Adelaide Dolphin Sanctuary, the community and industry have become more involved in these decision-making processes. Also many other community initiatives such as Coastcare, Reef Watch, Water Watch and Fishwatch continue to be successful.



Hindmarsh Island Coastcare project  
(R Sandercock, DEH).



## SIGNIFICANCE OF SOUTH AUSTRALIA'S COASTAL, ESTUARINE AND MARINE ENVIRONMENTS

South Australia's coast, estuaries and marine waters have significant environmental, economic, social, and cultural value to all South Australians. Our coast supports a wide variety of ecosystems through a mixture of sheltered water within Gulfs and embayments and open ocean coast. The coast varies from cliffs, rocky shores and sandy beaches in the South-East and West Coast to mud flats, seagrass, samphire and mangrove habitats in the upper Gulf St Vincent and Spencer Gulf. Parts of the coast are spectacular.

Our marine and estuarine waters, with their high levels of endemism, represent some of the most biologically diverse waters in Australia and the world. A range of different habitats is evident in this marine environment, from warm salty waters in the gulfs to cool-water kelp forests in the south-east, from the low productivity waters of the Great Australian Bight to the nutrient rich upwellings of the south-east.

The waters support more than 6000 invertebrates, 1200 algae, 350 fish species, 16 breeding seabird species, 33 mammal species and 12 seagrass species. In the Southern Ocean, 75 per cent of the red algae, 85 per cent of the fish species and 95 per cent of seagrasses are found nowhere else in the world, giving them local, national and international significance. In comparison, the Great Barrier Reef shares more than 80 per cent of its fish, coral reefs and other marine organisms with other countries in the tropics.

Adelaide has wild dolphins living within its harbour. Like many marine species these communities of bottlenose dolphins are under threat from human beings and pollution.

South Australia has one coastal area listed as a Wetland of International Importance under the International Ramsar Convention: 'The Coorong and Lakes Alexandrina and Albert'. The Coorong has also been designated as a Shorebird Site of International Importance on the East Asian-Australasian Shorebird Site Network. The Coorong annually supports populations of five migratory bird species of conservation significance at the international level. There are 23 other coastal wetlands in South Australia that regularly support populations of one or more species of migratory birds of conservation significance that would meet the criteria to be nominated to the East Asian-Australasian Shorebird Site Network. These shorebirds breed in Alaska, northern China and Russia, and migrate up to 12 000 kilometres to East Asia, Australia and New Zealand. In South Australia, sand, mud and salt flats along the coastline and in estuaries - including the constructed salt fields in northern Adelaide and on Yorke Peninsula - are also important habitats for these migratory shorebirds.

Our coastal, estuarine and marine environments also represent a highly valuable economic resource. Activities such as recreation, tourism and marine-based industries, urban development, commercial fisheries and aquaculture, recreational and charter fishing, shipping and transportation, coastal agriculture, mining, manufacturing and trade, and science and education benefit the State and regional economies in many ways. In particular, South Australia's coastal, estuarine and marine habitats sustain high levels of fishing (both commercial and recreational) and aquaculture industries of increasing economic importance to the State. Fishing and aquaculture are second only to wine among developing industries contributing to the State economy.

With more than 90 per cent of South Australians living on or near the coast, socially and culturally the coastal and marine environment is valued for its recreational opportunities, amenity, tourism potential, rich cultural heritage, conservation and scientific significance. The South Australian coastline includes high quality landscapes with high amenity and scenic value. The significance or quality of landscapes is derived from a combination of landform, land cover, land use, water, diversity, naturalism and colour. Features that have particular visual significance include undeveloped prominent landforms (such as cliffs / rocky headlands), undeveloped areas, unique features (such as lighthouses) and specific elements of vegetation cover.



Innes National Park.



Coastal land is highly sought after and the potential for increased coastal development and marine-based tourism is well recognised. The coast ranks as the most popular holiday destination for 52 per cent of domestic travellers. The growth of the 'coastal tourism' market is a reflection of continued affection for the coast by Australians.

The Colonial Commissioners responsible for the settlement of South Australia recognised the importance of public rights to the coast in their instructions to the first Surveyor-General, Colonel Light. These instructions required the provision of a 'one chain road' along the extent of the coastline within the State. While it may have been impractical to create such a road, the land was set aside for public access to, and along, the coast (the '150 link reserve'). The concept of public waterfront land is not unique to South Australia but is largely preserved within the State.

Aboriginal occupation of South Australia was at its densest around the coast. Coastal, estuarine and marine environments provided valuable food and other resources and are of significant cultural value for indigenous people. Early European settlers were whalers and sealers, and these groups left little in the way of relics to mark their passing. Many shipwrecks lie off some of the most treacherous coastlines, serving as a reminder of the importance coastal shipping once held. It was the main way of servicing early settlements, especially in the gulfs. Other maritime heritage sites include jetties, wharves, buildings and navigational aids, which give the coastline non-indigenous cultural significance as well.

## KEY CHALLENGES

With such a large proportion of the population living on or near the coast, the integrity of South Australia's coastal, estuarine and marine environments is under significant pressure from development and use, pollution and the introduction of pest species.

Recent **environmental trends** are:

- area of seagrass along the Adelaide coastline is decreasing, with 720 hectares lost between 1995 and 2002;
- areas of mangroves are decreasing in some locations along the South Australian coastline;
- development along the South Australian coastline is increasing;
- pollutant loads in wastewater discharged into Gulf St Vincent are decreasing; and
- Marine Protected Areas have increased from 3.5 per cent of total State waters in 1996 to 4.4 per cent in 2002.

Reference: State of the Environment Report for South Australia 2003, Environment Protection Authority (2003).

Inappropriate coastal development in South Australia has resulted in major habitat loss, particularly coastal wetlands, dune systems, and seagrass communities. The natural movement of sand along the Adelaide coast has been significantly altered by the loss of seagrass and construction on the sand dunes and foreshore. This has resulted in significant ecological and economic consequences, including the need for protection works and ongoing active management of sand to maintain the foreshore. Continuing pressure on the coast for the development of housing, industry and support infrastructure needs to be addressed, as these activities are having cumulative impacts on coastal systems and their social, economic and cultural values.

The fate of coastal environments cannot be divorced from actions that occur in the catchments that feed these areas. Water flows, levels of turbidity and nutrients and salinity are all critical factors in keeping coastal environments, especially estuaries and embayments, healthy.

Pollutants, including sewage, stormwater, industrial effluent, anti-foulants, ballast water and catchment discharges that contain nutrients, organic sediments, heavy metals, and agricultural chemicals, impact on coastal, estuarine and marine habitats and species. Pollution causes the death of seagrasses and mangroves and also damages the health of entire ecosystems. The introduction of exotic marine pests via ballast water, hull fouling

Arno Bay, Eyre Peninsula (A Eaton, CPB).

and potentially via the aquarium trade, is a major concern. The high-priority pest species include the European fan worm, New Zealand green-lip mussels, *Caulerpa taxifolia* (aquarium Caulerpa), *Undaria pinnatifida* (wakame), *Asterias amurensis* (Northern Pacific sea star) and Japanese pearl oysters. Some species are already causing problems whilst others are a potential threat to South Australia. The potential introduction of toxic dinoflagellates via ballast water is of particular concern. Degradation of the marine environment can severely affect fisheries and aquaculture production, as well as reducing amenity, lowering biodiversity and being a nuisance.

We must deal effectively with these pressures to ensure ongoing opportunities for marine industry development, tourism, recreation and biodiversity conservation.

Although South Australia has a high level of endemism, our knowledge of marine environments is extremely limited. All users have a responsibility to improve our understanding of these environments.

Management of South Australia's coastal, estuarine and marine environments is addressed through focussed pieces of legislation, although there are some linkages between the *Coast Protection Act 1972*, *Environment Protection Act 1993*, *Aquaculture Act 2001*, *Native Vegetation Act 1991* and the *Development Act 1993*. Strategic planning and integrated management is needed for the long-term conservation, development and productivity of these environments.

There is a need for adequate environmental and planning frameworks to manage the increasing, and often competing, demands on coastal, estuarine and marine environments arising from development and use. The State has obligations under the *Aboriginal Heritage Act 1988* and the Commonwealth's *Native Title Act 1993*, which must be complied with.

It is important to seek a balance between natural, economic, landscape, and cultural heritage values. Coastal, estuarine and marine biodiversity and sites significant to indigenous and other Australians must be protected.

The development of *Our Seas and Coasts: A Marine and Estuarine Strategy for South Australia (1998)* was the first policy direction by the South Australian Government to provide an integrated management framework. This initiative referred to the Commonwealth Government's *State of the Environment Report 1996*, which identified the top five national concerns for the marine environment as:

- declining marine and coastal water quality;
- loss of marine and coastal habitat;
- unsustainable use of marine and coastal resources;
- lack of marine science policy and lack of long-term research; and
- lack of strategic, integrated planning.

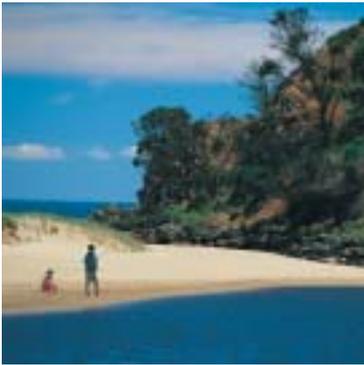
These concerns are still relevant today.

In October 2003, the Commonwealth, States and Territories - through the National Resource Management Ministerial Council - endorsed *A Framework for a National Cooperative Approach to Integrated Coastal Zone Management*. The Integrated Coastal Zone Management (ICZM) framework highlights all Australian governments' commitment to a national approach to coastal issues. This approach builds on efforts to implement the 1993 Resource Assessment Commission's (RAC) Coastal Zone Inquiry Report's recommendations to achieve long-term ecologically sustainable development of the coastal zone for present and future generations.

The ICZM framework sets the scene for national cooperation in managing coastal issues and achieving ecologically sustainable development outcomes in the coastal zone over the next decade. Whilst it is recognised that jurisdictions have different legislative and administrative frameworks for managing the coastal zone, adopting a national cooperative approach will address cross-border and sectoral issues; harmonise joint action towards management of common issues; and build on existing and encouraging potential new investments from all jurisdictions.



Lobster fishing boat (PIRSA).



The two major outcomes to be achieved through the framework at the national, State, regional and local levels are:

- managing coastal issues that are of national scale and scope; and
- managing coastal issues where complementary arrangements will work better.

Issues of national scale and scope require national efforts to maximise returns to the nation as a whole. The main coastal issues identified of national importance within the ICZM framework are:

- land and marine based sources of pollution;
- Climate Change – opportunities and threats;
- introduced pest plants and animals;
- allocation of coastal resource use; and
- capacity building.

It is also recognised that there are specific coastal issues that would benefit further from complementary arrangements between jurisdictions under a national approach. The framework provides a mechanism to encourage complementary arrangements to build on the successes and the momentum established through current State and Territory coastal management initiatives.

A detailed implementation plan is to be prepared to achieve the ICZM framework outcomes and ensure the key actions identified under the themes are implemented within nominated time frames. These actions will build on existing coastal management initiatives at the Commonwealth, State and local levels. A precis of the ICZM framework is provided in Appendix 3.

## THE STRATEGY

The *Living Coast Strategy* addresses the Government's environmental policy commitments for coastal, estuarine and marine environments. It encompasses a range of environmental initiatives and programs and sets out the policy directions that the State Government will be taking over the next five years to help protect and manage South Australia's coastal areas, estuaries and marine ecosystems for their conservation and sustainable use. The Strategy builds on the South Australian Government's previous *Our Seas and Coasts: A Marine and Estuarine Strategy for South Australia* and integrates with the State's commitment to the National Cooperative Approach to Coastal Zone Management (October 2003). Gaps in the current management of South Australia's coastal, estuarine and marine environments are identified and actions proposed to address these deficiencies.

The *Living Coast Strategy* presents an integrated framework to manage and coordinate the wide range of competing uses of South Australia's coastal and marine resources consistent with Ecologically Sustainable Development principles (see Appendix 1). This integrated approach will ease the increasing conflicts between the broad range of uses (such as conservation, primary production, transport, development, tourism, recreation, mineral exploration, coast protection and heritage). It will also protect key areas of ecological and economic significance.

The actions in the *Living Coast Strategy* are consistent with South Australia's obligations under the ICZM framework and other domestic inter-governmental agreements and international treaties, conventions and agreements to which Australia is a signatory (refer Appendix 2).

Actions and responsible agencies are contained in Appendix 4.

## GOAL

The conservation of coastal, estuarine and marine ecosystems and the sustainable use of these ecosystems.

## GUIDING PRINCIPLES

The following principles will guide the sustainable use of South Australia's coastal, estuarine and marine environments:

- Coastal, estuarine and marine environments are a valuable and common resource.
- Ecologically Sustainable Development is fundamental to the long-term conservation and productivity of coastal, estuarine and marine environments.
- Ecosystem-based management is essential to achieve conservation and Ecologically Sustainable Development.
- The conservation of biological diversity and protection of ecological integrity, supported by use of a precautionary approach to avoid threats of serious or irreversible environmental damage, are critical to decision-making.
- The economic importance to the State from the use of coastal, estuarine and marine resources is recognised.
- Recognising Aboriginal heritage and the indigenous cultural values of our coastal, estuarine and marine environments is fundamental.
- Community involvement is essential for balanced and transparent decision-making.
- Actions are consistent with South Australia's obligations under domestic inter-governmental agreements and international treaties and conventions to which Australia is a signatory.

## OBJECTIVES

The *Living Coast Strategy* identifies and addresses six key objectives:

- To provide a legislative and policy framework for ecologically sustainable development and use of our coastal, estuarine and marine environments.
- To conserve and safeguard the natural and cultural heritage of our coastal, estuarine and marine environments.
- To control pollution of our coastal, estuarine and marine environments.
- To protect our coastal, estuarine and marine environmental assets.
- To improve understanding of our coastal, estuarine and marine environments.
- To develop and maintain partnerships between State and local governments, community and industry.



Glenelg beach (SATC).



Oyster farm (PIRSA).

## ACHIEVING OUR OBJECTIVES

### OBJECTIVE 1. TO PROVIDE A LEGISLATIVE AND POLICY FRAMEWORK FOR ECOLOGICALLY SUSTAINABLE DEVELOPMENT AND USE OF OUR COASTAL, ESTUARINE AND MARINE ENVIRONMENTS

The vast majority of the marine environment and the immediate coastal lands fronting the shore vested in the Crown. The land below high water mark is currently freehold in the name of the Minister for Transport (under the *Harbors & Navigation Act 1993*) and land above that mark that has not been alienated into private ownership is unallotted Crown Land or public reserve administered by local government (under the *Crown Lands Act 1929*).

Planning, resource allocation and control of activities including development in coast, estuarine and marine environments are achieved through a range of legislation administered by various State and local government agencies. Whilst individual pieces of legislation address environmentally sound principles, they do not necessarily operate in an integrated manner. Historically, the management of the coast and marine environment has been based on 'sectoral' planning, which is typically characterised by agencies executing their roles and responsibilities without full consideration of other existing or potential uses. To date, integrated decision making and resulting actions have been limited to the *Development Act 1993*, for development or administrative arrangements.

Without integration and, more importantly, a clearer responsibility within the Government for integration, there is an increasing risk of sectoral interests addressing immediate needs to the detriment of overall community interests and long-term benefits; a situation that parallels the 'Tragedy of the Commons'.

Presently, there is neither cohesive State Coast and Marine Policy nor coordinating decision-making authority. An integrated approach to planning and ecologically sustainable development and management, which takes account of any Aboriginal heritage and native title issues, would ease the increasing conflicts between user groups and ensure key areas of ecological and economic significance are adequately protected.

### STRATEGIES

#### 1.1 Develop and Implement New Coast and Marine Legislation

A Coast and Marine Act is proposed to replace the existing *Coast Protection Act 1972*. The Act will reinforce integrated planning and sustainable use of coastal, estuarine and marine environments through a framework that ensures their use and development is consistent with the principles of Ecologically Sustainable Development (ESD).

The Act will facilitate informed decision-making across jurisdictions based on sound scientific and other specialist knowledge and understanding of South Australia's coastal and marine ecosystems. It is anticipated that the new Act will provide the statutory basis for Marine Plans and the proposed Marine Planning Framework. It is also anticipated that the new Act will establish a Coastal and Marine Authority and an Advisory Board to provide specialist management, understanding and knowledge.

The new Act would interact with and inform the *Development Act 1993*, the proposed Natural Resource Management Act and other coast and marine resource use legislation.

#### **ACTION:**

Develop Coast and Marine legislation, which establishes a Coast and Marine Authority to assist with the integrated, multiple-use management of the coast and marine environment by providing specialist management, understanding and knowledge.

## 1.2 Develop a Marine Planning Framework

The Government is investigating an integrated policy framework for the management and protection of coastal areas, estuaries and the marine environment. This framework will guide ecosystem-based management to help achieve ecologically sustainable use via individual Marine Plans that will cover the eight marine bioregions across State waters. A plan will establish zones based on particular environmental values and set goals, objectives and strategies to ensure activities within each zone are compatible with the ecological values of that zone.

The overarching vision and strategies from the Marine Plans will be reflected in the *Planning Strategy for South Australia* under the *Development Act 1993* and be incorporated into relevant Development Plans. In this way, the Marine Planning Framework integrates coastal and marine planning to provide for sustainable use of the broad range of marine resources.

Documents prepared under existing resource management legislation will be required to relate to relevant objectives contained in Marine Plans and the *Planning Strategy for South Australia*. Coastal and marine development would continue to be regulated through the *Development Act 1993* and the Development Plans under that Act. Development-related Marine Plan policies should be adopted under relevant Development Plans through the Plan Amendment Report (PAR) process.

Control of activities not defined as development under the *Development Act 1993* continues via other resource management legislation (fisheries, mineral and hydrocarbon exploration and extraction, local government, native vegetation and aquaculture in some cases). Resource management legislation or plans would be amended, where necessary, to ensure that documents prepared under these Acts (such as Coastal Management Plans, Fisheries Management Plans, and National Parks Management Plans) have regard to the relevant Marine Plan.

### **ACTIONS:**

Use the Marine Planning Framework to strengthen and integrate coastal and marine planning for sustainable use of marine resources and related activities.

In consultation with stakeholders, develop statutory Marine Plans, covering the marine bioregions of South Australia, that establish zones based on particular environmental values and set out objectives and strategies to ensure activities within each zone are compatible with those values.

## 1.3 Ensure Linkages with the Planning Strategy for South Australia and State Natural Resource Management Plan

The *Planning Strategy for South Australia* outlines the key economic, social and environmental objectives for a well-planned State. The current review of the Adelaide Metropolitan and the Inner Regional volumes of the *Planning Strategy for South Australia* will include references to the Marine Planning process and the need to fully integrate land and marine planning to protect both the coastal and the marine environments. Further information on the marine environment will be incorporated into future updates of the *Planning Strategy for South Australia* (Adelaide Metropolitan, Inner Regional and Regional volumes) as a result of the Marine Planning Framework and following the completion of Marine Plans throughout the State.

Under the *Development Act 1993*, amendments to Development Plans (through PARs) must be consistent with the provisions of the Planning Strategy. The Improved Policies and Procedures (IPAP) program currently being undertaken by Planning SA will further strengthen the linkages between the *Planning Strategy for South Australia* and Marine Plans. This will further assist in ensuring that the strategies and objectives of the Marine Plans are incorporated into the relevant Development Plans.



Port Lincoln prawn boats (PIRSA).



## MANAGEMENT OF ESTUARIES

In South Australia, an estuary is defined as:

*'A partially enclosed coastal body of water, including its ecosystem processes and associated biodiversity, which is either permanently, periodically, intermittently or occasionally open to the ocean within which there is a measurable variation in salinity due to the mixture of seawater with water derived from on or under the land.'*

Estuaries, as transition zones between river catchments and the ocean, provide important social, economic and ecological services. They provide important ecological functions (such as breeding, spawning and nursery habitats for many fish species and drought refuge for waterbirds), maintain biodiversity and water quality, are highly productive, provide storm and erosion protection to shorelines and inland areas, support commercial and recreational interests (such as fishing, development, harbours and ports, tourism and recreation), have important cultural value and provide an educational resource. Many impacts arising from the use of estuaries reduce their capacity to continue to provide these functions.

Coastal developments and infrastructure can result in estuary habitat destruction both above and below low water mark. Industries, sewage and stormwater outputs often result in a decline in water quality, while unregulated fishing practices can impact on the population stability of particular species. Land clearance, agricultural activities and regulation of rivers throughout a catchment also affect the quality, quantity and frequency of freshwater entering an estuary. Actions at sea, such as oil spills and ballast water discharges, can also degrade estuaries. Although many statutory and non-statutory bodies are involved in activities that affect estuaries, South Australian estuaries require coordinated management.

Coorong (River Murray Urban Users Committee).

The proposed Natural Resource Management (NRM) legislation, currently before the Parliament, makes provision for the establishment of a NRM Council and Regional NRM Boards. The NRM Council must seek to have an integrated and strategic view of NRM over the whole State, including State Waters.

Regional NRM Boards will produce regional NRM plans and investment strategies dealing with land to the low water mark and also land-based impacts on the marine environment. Regional NRM plans and investment strategies will be consistent with the advice of statutory bodies such as the Coast Protection Board, or any successor, and with relevant statutory plans such as Marine Plans under the new Coast and Marine Act. It is envisaged that the goals, objectives and strategies from Marine Plans would be reflected in the State NRM Plan in a similar fashion to the *Planning Strategy for South Australia*. NRM Plans will inform planning policy as part of the proposed revisions to the *Development Act 1993* and therefore influence coastal development.

### **ACTION:**

Incorporate marine objectives from Marine Plans into the Planning Strategy for South Australia and the State NRM Plan thereby reinforcing the role of these documents in the coastal and marine zone.

## 1.4 Develop an Estuaries Policy

All Catchment Water Management Plans developed by Catchment Water Management Boards (CWMBs) refer to plans to improve the quality of stormwater discharges into estuaries. The Regional Integrated Resource Management Plans address management issues for estuaries.

In December 2001, the Coast Protection Board developed a report entitled: *The Status of South Australia's Estuaries: A Proposal for a State Estuary Program*. The Government is now developing an Estuaries Policy, an initiative of the State Water Plan, outlining clear objectives and actions for the sustainable use and conservation of estuaries in South Australia. Recommendations specific to estuary management will also be developed for incorporation into Regional NRM Plans.

### **ACTION:**

Develop an Estuaries Policy that identifies issues, objectives and principles and recommends actions for the management and conservation of estuaries in South Australia.

## 1.5 Facilitate Integration of Coastal, Estuarine and Marine Resource Management Legislation

Coastal, estuarine and marine resources are managed through a range of legislation.

### 1.5.1 Crown Lands

A significant length of coast, between the high water mark and the nearest road or private land, is Crown land (unallotted or reserved for public purposes) administered by the Department for Environment and Heritage (DEH) under the *Crown Lands Act 1929*. This Act empowers the Minister for Environment and Conservation to control use and occupation of waterfront land and other Crown land, to issue leases or licences, or to set aside areas for public or government use. The Minister can also specify Crown land as a reserve under the care, control and management of a body, association or municipality. Local government has been given this responsibility in most urban waterfront situations. In some cases, this has led to a diminishment of public rights by design (such as leases for kiosks and boating clubs) or by condoning or dismissing unauthorised use (encroachments, squatting, inappropriate vehicle access, etc).

The *Crown Lands Act 1929* specifically precludes the grant of freehold title of any foreshore to any person. While the definition of foreshore has been the subject of debate, DEH has adopted a general policy of not granting freehold over waterfront land and taken opportunities to consolidate public rights to waterfront land whenever such opportunities arise, such as freeholding of lease adjoining waterfront Crown land.

A draft Bill is in preparation to replace the *Crown Lands Act 1929*. Proposed changes to the *Crown Lands Act 1929* will improve the options available for coordinated decision-making and involvement of other authorities in the allocation and management of waterfront Crown land. It will also give much needed emphasis to management of the natural and built environment on Crown land in an ecologically sustainable manner.

The *Harbors and Navigation Act 1993* vested responsibility of the seabed below the high water mark out to the State limit in fee simple with the Minister for Transport. Previously this had been Crown land under the *Crown Lands Act 1929*. However, as the flexibility and accountability contained in the proposed Crown Lands Act provides an improved mechanism for handling emerging seabed issues (marine conservation, foreshore development, etc) there is no justification for retaining two Crown land administration authorities.

It is proposed to amend the provisions of the *Harbors and Navigation Act 1993* to provide for the seabed from high water mark to the State limit to revert to the status of unallotted Crown land and for tenure to be allocated under the proposed Crown Lands Act. The purpose of this initiative is to provide the Minister responsible for the *Crown Lands Act 1929* with greater control over the seabed, provide more options for tenure allocation in future for all purposes, including marine reserves, and to remove the administrative demarcation that currently exists at the high water mark. The proposed amendment will provide a greater range of options for dealing with aquaculture and other interests in the seabed, such as issue of Crown leases, strata leases, licences to occupy, reserves and easements.



Lands End, Fleurieu Peninsula (A Eaton, CPB).



Oyster farm (PIRSA).

### 1.5.2 Aquaculture

The *Aquaculture Act 2001* regulates the marine and inland farming of aquatic organisms in South Australia. An objective of the *Aquaculture Act 2001* is to promote ESD. The Minister responsible for the Act must consider ESD in all aquaculture policies and any new licences issued. The Aquaculture Advisory Committee enables an effective partnership between Government agencies, community and industry representatives, research scientists and the Local Government Association (LGA).

New aquaculture ventures are sited and managed to meet ESD principles. The aquaculture industry is monitored by Primary Industries and Resources SA (PIRSA) and changes to farm practices are made where and when necessary. Water quality is assessed during a technical investigation's review of any area before aquaculture is considered. Subsequently, environmental/carrying capacity models are used to determine suitability for specific types of aquaculture (finfish or shellfish). Water quality is also assessed as part of annual environmental reports and, in the case of shellfish, is monitored monthly. Benthic communities are assessed during the technical investigations by field assessment during the application process and again by annual benthic videos as part of the ongoing environmental monitoring. Genetic diversity of stocks is assessed on a site-by-site basis as part of the ecological sustainability risk assessments that are included in the application process.

Licence conditions dictate that farmers must take all reasonable precautions to prevent stock escapes and any escapes must be reported immediately to PIRSA. Where farms have had escapes, they must now have escape minimisation and stock recovery plans in place.

All aquaculture farms are required to have marine mammal management plans in place if the ecological sustainability risk assessment concludes interaction with marine mammals as a possibility. There are disease management protocols for aquaculture farms and all diseases must be reported immediately. Disease management is considered during the application assessment.

### 1.5.3 Fisheries

The *Fisheries Act 1982* provides for the conservation, enhancement and management of fisheries, the regulation of fishing and the protection of certain fish; the protection of marine mammals and aquatic habitat; the control of exotic fish and diseased fish, and the regulation of fish farming and fish processing.

Offshore Constitutional Settlement agreements with the Commonwealth Government give transfer jurisdiction for many species out to 200 nautical miles.

As a signatory to the National ESD Reporting Framework developed by the Commonwealth Standing Committee on Fisheries and Aquaculture, South Australia is bound to integrate ESD principles into fisheries management practices. In addition, all fisheries in Australia that export overseas must comply with Environment Australia's Guidelines for the Ecologically Sustainable Management of Fisheries.

The *Fisheries Act 1982* is currently under review to include, amongst a number of other aspects, ESD objectives.

Fisheries Management Plans, incorporating Bycatch Action Plans, are presently being finalised for all major fisheries. The current plans are undergoing review to include an ESD framework and an assessment of the fisheries. These reviews include community consultation.

Fisheries Management Committees (FMCs) provide collaboration between community, industry and Government on fishery systems of assessment and

approvals for the ecologically sustainable use of the marine environment. Public FMC meetings are held on an annual basis in addition to the regular FMC meetings.

The Government is working closely with the fishing and aquaculture industries to manage fisheries and habitat conditions. The aim is to have ecologically sustainable and profitable fisheries and aquaculture enterprises being professionally managed with input from all interested groups.

Recreational fishers can also potentially have a significant impact on the marine environment and need to be managed. A management strategy for the sustainable development of recreational fishing in South Australia sets out a five year framework for maintaining and building upon the significant values and benefits of recreational fishing. This strategy was prepared by the Recreational Fishing Industry Review Committee, comprising recreational fishing representatives and facilitated by PIRSA Fisheries. The strategy is based on principles acknowledging the importance of community involvement, partnerships and shared responsibilities in the ecologically sustainable development of recreational fisheries. One of the six strategic goals is 'Community Ownership' and the promotion and development of involving recreational fishers in the management of South Australia's fisheries.

#### 1.5.4 Mineral and Petroleum Exploration

##### Minerals

In South Australia, minerals are the property of the Crown. The *Mining Act 1971* governs all proposed exploration and/or mining activities to be undertaken upon all mineral land, including within any gulfs, bays, inlets and harbours of the State and within three nautical miles of the low water mark on the seashore.

There are special provisions in the *Mining Act 1971* for coastal land. For example the boundaries of mineral exploration tenements are normally defined as 800 metres inland of the coastline. Tenements can be granted over the coastal strip and it can be explored but there are additional conditions and constraints.

The *Offshore Minerals Act 2000* governs all proposed exploration and/or mining activities to be undertaken in coastal waters, being from the coastal boundary of the State to three nautical miles beyond the baseline (but excludes the gulf waters).

Exploration and mining cannot be undertaken on any land or within coastal waters other than in accordance with the provisions of either of these Acts and their subordinate Regulations. Consultation is required for all tenement applications and, depending on the nature and location of the proposed tenement, approvals and/or further consultation may be required pursuant to legislation covering environmental, planning and Aboriginal issues.

##### Petroleum

ESD is embodied in the *Petroleum Act 2000* and it is a requirement that any exploration activity within South Australia and State coastal waters is subject to a thorough environmental risk assessment. The impacts of any exploration activity on the receiving environment are identified and the necessary environmental management measures are implemented to ensure that stakeholder concerns are recognised and addressed.

The State Government is also the delegated authority for the Commonwealth's *Petroleum (Submerged Lands) Act 1967* and the South Australian *Petroleum (Submerged Lands) Act 1982* for waters beyond the State limit (three nautical miles). This Act includes regulations for management of the environment, which mirror the philosophy of the South Australian legislation.



Nullabor Cliffs.



Underwater algae community dominated by *Ecklonia radiata*, near Granite Island (A. Melville, University of Adelaide).

### 1.5.5 Environment Protection

The *Environment Protection Act 1993* provides for the protection of the environment and establishes the Environment Protection Authority and defines its functions and powers.

The objects of this Act are to promote the principles of ESD and to ensure that all reasonable and practicable measures are taken to protect, restore and enhance the quality of the environment.

The *Environment Protection (Water Quality) Policy 2002*, which is established under the Act, is a powerful legislative tool in the protection of coastal, estuarine and marine environments.

The *Environment Protection (Sea Dumping) Act 1984* provides for the protection of the environment by regulating the dumping into the sea, and the incineration at sea, of wastes and other matter and the dumping into the sea of certain other objects. This Act has not been proclaimed and is currently being reviewed.

The *Pollution of Marine Waters (Prevention of Pollution from Ships) Act 1987*, previously known as the *Pollution of Waters by Oil and Noxious Substances Act*, relates to the protection of the sea and certain waters from pollution by oil and other noxious substances. Other requirements in the legislation relate to the construction of ships and the types of facilities required on ships before they can carry noxious substances (eg. chemical tankers). The Act also provides the Government with provision for removal and prevention of pollution and recovery of costs. The *International Convention for the Prevention of Pollution from Ships 1973*, is also included in the legislation.

### 1.5.6 Native Vegetation

The *Native Vegetation Act 1991*, administered by the Department of Land, Water and Biodiversity Conservation (DWLBC), regulates native vegetation - a plant of a species indigenous to South Australia, including a plant or plants growing in or under waters of the sea. The Act also provides incentives and assistance to landowners in relation to the preservation and enhancement of native vegetation and to control the clearance of native vegetation.

The *National Parks and Wildlife Act 1972* administered by DEH provides for the establishment and management of reserves (National Parks, Conservation Parks, Game Reserves, Recreation Parks, Regional Reserves and Sanctuaries) for public benefit and enjoyment. The Act also provides for the conservation of wildlife in a natural environment and regulates the taking, release, keeping, farming and harvesting of protected animals.

### 1.5.7 Heritage

Aboriginal Heritage is protected in South Australia by the *Aboriginal Heritage Act 1988*. This Act provides broad measures for the protection and preservation of Aboriginal heritage, including the protection and preservation of Aboriginal remains, and sites and objects that are of significance according to Aboriginal tradition, archaeology, anthropology or history.

The *Historic Shipwrecks Act 1981* relates to the protection of certain shipwrecks and relics of historic significance including the declaration of protected zones, and is administered by DEH.

### 1.5.8 Native Title

In 1982, Eddie Mabo and other members of the Meriam people of the island of Mer in the Torres Strait began legal proceedings in the High Court of Australia,

claiming traditional title to three islands on which their group resided. Prior to the High Court's decision in *Mabo v the State of Queensland (No.2)* (1992) 175 CLR 1, in June 1992, Australian law did not recognise indigenous property rights.

In *Mabo (No.2)*, the High Court of Australia declared that the common law of Australia recognised native title rights and interests in land. Native title rights were described as:

*[T]he interests and rights of indigenous inhabitants in land, whether communal, group or individual, possessed under the traditional laws acknowledged by and traditional customs observed by the indigenous inhabitants.*

This formulation of native title rights has since been refined and developed by the Courts and by the Federal Government in the *Native Title Act 1993*, which defines native title as:

*"the communal, group or individual rights and interests of Aboriginal peoples or Torres Strait Islanders in relation to land or waters, where:*

- (a) the rights and interests are possessed under the traditional laws acknowledged, and the traditional customs observed, by the Aboriginal peoples or Torres Strait Islanders; and
- (b) the Aboriginal peoples or Torres Strait Islanders, by those laws and customs, have a connection with the land or waters; and
- (c) the rights and interests are recognised by the common law of Australia."

Accordingly, where Aboriginal people have maintained a continuous connection with land since white settlement in accordance with their traditional laws and customs, and those rights have not been extinguished by an inconsistent act by the Crown (for example the grant of a freehold title or perpetual lease), those rights are now recognised and protected by the common law and the *Native Title Act 1993*. The Act therefore, provides for:

- (a) the recognition of native title;
- (b) the protection of native title;
- (c) certainty for Governments in relation to land management activities in the past and in the future; and
- (d) a process for native title claims to be made.

South Australia's Parliament has passed *The Native Title (South Australia) Act 1994*, which is complementary to the *Commonwealth Native Title Act 1993*.

The *Native Title Act 1993* will apply to actions of the State, which may affect native title. South Australia has a responsibility to ensure that its actions are done consistently with its obligations under the *Native Title Act 1993*.

### 1.5.9 Development

The *Development Act 1993* provides for planning and regulation of development in the State; regulates the use and management of land and buildings, and the design and construction of buildings; and makes provision for the maintenance and conservation of land and buildings where appropriate. The object of this Act is to provide for proper, orderly and efficient planning and development in the State.

Specific Objectives and Principles for new development to minimise its impact on sensitive coastal areas and exposure to coastal hazards including erosion, flooding and cliff collapse are included in Development Plans.

### 1.5.10 Harbors and Navigation

Transport SA has considerable responsibilities for overseeing marine and harbours management. The *Harbors and Navigation Act 1993* provides for the safe



Adelaide metropolitan coastline (A Eaton, CPB).



navigation of vessels in State waters and the safe use of these waters for recreational and other aquatic activities. The provision of marinas and other mooring facilities contributes to the achievement of these objectives. In the development of these facilities, Transport SA has sought to use the lease, licence or transfer of care, control and management of marine facilities to impose development and use conditions as well as limit the ongoing maintenance (such as dredging of access channels) and liability of the Government. In meeting these challenges, any development has been the subject of the development process under the *Development Act 1993*.

Under the *Harbors and Navigation Act 1993*, a Boating Facilities Advisory Committee has been established to advise the Minister for Transport on the establishment, maintenance and improvement of commercial and recreational vessel facilities, such as marinas and their associated access channels. This is an ongoing function and intrinsically linked with the ownership of the land.

The Minister for Transport, as the Minister responsible for the seabed, is involved in siting of aquaculture developments, marine facilities (such as jetties and breakwaters) and ports management, including ballast water management in ports and dredging for access by vessels.

#### 1.5.11 Tourism

South Australia's tourism vision contained within the South Australian Tourism Plan 2003-2008 is to be a leader in innovative and sustainable tourism. Within the context of achieving sustainable tourism, the Plan focuses on four key goals, including the development of authentic destinations and products.

At the State level, tourism is an integral part of State planning processes, influencing the Planning Strategy, the Transport Plan, the Economic Development Plan, and Integrated Natural Resource Management Plans. Both Regional Economic Development Plans and local Development Plan policies are affected.

The combined challenge for the private and Government sectors is to encourage low key, innovative, environmentally sensitive development of tourism facilities and infrastructure along our coastline, thereby promoting and preserving an authentic and unspoilt experience.

The South Australian Tourism Commission (SATC) has developed the Sustainable Tourism Package (STP) to foster planning policy and decision-making for sustainable and innovative tourism development and to ensure both our cultural heritage and the natural environment are protected. The STP allows public and private stakeholders to be clear and confident about what constitutes appropriate and sustainable tourism development. An initiative of the STP, a 'Developers' Guide to Sustainable and Innovative Tourism Development', will provide examples of various best practice aspects of existing tourism developments within Australia and promote the adoption of performance criteria and design innovations by the industry.

#### 1.5.12 Coast Protection

The *Coast Protection Act 1972* provides for the protection of existing development and public lands exposed to coastal hazards (such as flooding and erosion) and the provision of advice on the location of new development to avoid/minimise risk through the *Development Act 1993*.

#### **ACTION:**

Ensure planning or actions that occur under marine resource management legislation have regard to Marine Plans.

Jetty fishing, Coffin Bay, Eyre Peninsula (SATC).

## 1.6 Maintain Effective Inter-Governmental Relations

The *Living Coast Strategy* will be reliant on better development and maintenance of effective formal and informal linkages between all spheres of Government, including those agencies with key responsibilities in coastal, estuarine and marine environments.

Existing Government committees include:

- South East States Working Group, which is advising the Commonwealth on State-related matters regarding the development of the Regional South-East Marine Plan;
- Marine and Coastal Committee, a sub-committee of the NRM Standing Committee, which provides advice to the NRM Ministerial Council on national coastal and marine matters;
- Inter-governmental Coastal Advisory Group, which has representatives from the States and Commonwealth working on the development of key national coastal issues;
- Marine Planning/Marine Protected Areas Steering Committee, a State/local government committee whose role is to review the Marine Planning and MPA processes, and to provide advice and guidance to both projects;
- Spencer Gulf Regional Consultative Committee, with membership from towns around Spencer Gulf, is responsible for contributing to the preparation of a Marine Plan for Spencer Gulf, with technical support from DEH;
- Metropolitan Seaside Councils Committee, which facilitates local government issues on metropolitan coastal management. The committee comprises representatives of the Onkaparinga Council, Holdfast Bay Council, West Torrens Council, Marion Council, Adelaide Shores (West Beach Trust), Charles Sturt Council and Port Adelaide-Enfield Council; and
- Aboriginal Heritage Committee, which is a statutory body, established under the *Aboriginal Heritage Act 1988* to represent the interests of Aboriginal people in the protection and preservation of Aboriginal heritage.

### **ACTION:**

Promote inter-governmental relations to underpin the *Living Coast Strategy* and support integrated planning and management.



Walking along the boardwalk, Seal Bay, Kangaroo Island (SATC).



## CURRENT STATUS

The State Government has removed mining and petroleum access rights that cover the sanctuary and conservation zone of the Great Australian Bight Marine National Park. The whale sanctuary, proclaimed under the *Fisheries Act 1982*, has no access for mining and petroleum activities. A management plan for the Park is being prepared.

The 'Marine Species of Conservation Concern Working Group', identifying marine species of conservation significance in South Australia, has developed a set of criteria for assessment and collated a first draft of marine taxa for consideration that includes more than 150 species. The criteria for listing, modified from IUCN guidelines, are being applied to each taxon to rank each species according to its conservation status. The Working Group anticipates completing a draft list of species for consultation in 2004.

The Government has launched Naturelinks with the long-term aim of ecological restoration through the development of large-scale conservation projects.

The Coast Protection Board has coordinated the development of a brochure to educate the public about garden plants that become serious coastal weeds (Garden Plants that are Known to Become Serious Coastal Weeds, CPB, No. 34 September 2003).

The invasive toxic marine algae *Caulerpa taxifolia* was recently discovered and is being eradicated from West Lakes and in the upper reaches of the Port River. To prevent the spread of this introduced species into Gulf St Vincent, West Lakes is being temporarily converted to a fresh water environment, and this may also extend to the upper reaches of the Port River, upstream of the Birkenhead Bridge.

Old Wives [*Enoplosus armatus*] in  
Brown algae [*Scaberia agarathii*] Normanville  
(D Muirhead, Marine Life Society of SA).

## OBJECTIVE 2. TO CONSERVE AND SAFEGUARD THE NATURAL AND CULTURAL HERITAGE OF OUR COASTAL, ESTUARINE AND MARINE ENVIRONMENTS

The South Australian coastline and adjacent seas are recognised internationally as having great biodiversity value with very high levels of endemism. The marine and estuarine waters are unique and represent some of the most biologically diverse waters in Australia and the world. However, improved understanding of local species and ecosystem interactions and changes in the health and distribution of species is required to ensure their continued protection.

Many of the conservation issues that affect South Australia's coastal, estuarine and marine environments are focussed in shallow coastal waters where subtidal and sand mudflat habitats exist. These areas are very diverse and valued for their biodiversity as well as being important habitats for recreationally and commercially valued species. Notably seagrasses, mangroves and samphires provide significant productivity as well as essential habitat for fish and many other species.

Threats to coastal, estuarine and marine environments from pollution (sewage, stormwater, industrial effluent, agricultural run-off and the use of anti-foulants) and the destruction of coastal, estuarine and marine habitats are of serious concern. There has been considerable habitat loss, particularly in coastal wetlands, dune systems, reefs and seagrass communities. Pollution and development, including aquaculture, have the potential to result in significant further damage to coastal, estuarine and marine environments. The continuing loss of seagrass, mangroves and samphires in many of South Australia's regions is a major concern for the health of coastal, estuarine and marine environments.

The introduction of exotic flora, fauna and aquatic pest species is also of serious concern. This could occur via imported feed for farmed fish or the escape of introduced marine species.

Greater representation of coastal and marine habitats and species in areas protected and managed for biodiversity conservation is required. South Australia now lags behind in the implementation of the National Representative System of Marine Protected Areas (NRSMPAs). There is a need to protect coastal and marine habitats, species assemblages, individual species and genetic resources.

Most of South Australia's estuaries require both water from land catchments and tidal flushing to maintain their health. Environmental flows in creeks and rivers must be provided to maintain the biodiversity assets in estuaries. Environmental flow for the estuary of the River Murray is an issue of major environmental significance to the Government and many South Australians. Although not well understood at this time, groundwater is likely to play a role in inputs of water to both estuaries and near-shore marine ecosystems. These linkages need to be understood better and surface and groundwater managed conjunctively. Additionally, the nature and function of groundwater-dependent coastal and marine ecosystems need to be investigated. These ecosystems may act as de facto 'estuaries' for some fish species that are estuarine-obligate breeders.

There is also a lack of appreciation of the importance of South Australia's coastal lands in providing habitat for a number of unique and significant species. An example is the Coastal Bitterbush Blue Butterfly, which is restricted to the coastal Bitterbush *Adriana klotzschii*. However, many of these areas are under threat from coastal weeds and lack of management of access to these fragile areas.

Conservation of biological diversity and ecological integrity must be a fundamental consideration in decision-making. A precautionary approach needs to be adopted to avoid threats of serious or irreversible environmental damage. Indigenous cultural knowledge and values also need to be recognised. South Australia must also ensure it is addressing its responsibilities under national agreements and international treaty obligations.

Indigenous cultural knowledge and values also must be recognised. South Australia has obligations under the *Aboriginal Heritage Act 1988* in relation to the protection and preservation of Aboriginal heritage that must be complied with. South Australia has a responsibility to ensure that its actions are done consistently with its obligations under the *Native Title Act 1993*.

## STRATEGIES

### 2.1 Establish Effective Conservation Strategies

Assessment of the ecological significance of coastal, estuarine and marine habitats and the status of the State's management arrangements for these habitats will enable the identification of areas of conservation significance to ensure that efforts are directed toward adequate protection of the State's species and ecosystems.

#### **ACTION:**

Assess the conservation significance of coastal, estuarine and marine habitats and the status of the management arrangements for these habitats.

Improving the process for the regular review and assessment of the ecological status of coastal and marine habitats is a necessary aspect of SoE Reporting. A broader range of coastal and marine environmental indicators and threats needs to be included.

#### **ACTION:**

Improve the process for the regular review and assessment of the ecological status of coastal, estuarine and marine environments through the Government's State of Environment Reporting.

#### 2.1.1 Develop and Implement Marine Plans

Marine Plans have a crucial role in setting a framework for improved protection of ecologically sensitive habitats. They will identify areas of ecological significance to the functioning of our marine habitats and ecological processes and establish strategies and principles for the protection of these areas. They will also facilitate informed regional decision-making, based on sound knowledge and understanding of the marine environment's ecological values in South Australia and the risk to these values.

#### **ACTIONS:**

Test the concept of marine planning through the release of a pilot Spencer Gulf Marine Plan for public consultation.

Identify areas of ecological significance through the development of Marine Plans based upon marine bioregions.

#### 2.1.2 Establish Marine Protected Areas

A Marine Protected Area (MPA) is any area of intertidal or sub-tidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, that has been reserved by law or other effective means to protect part or the entire enclosed environment (IUCN 1988).

A 'representative system' of MPAs is one that contains MPAs, which make a contribution to the conservation of overall marine biodiversity. Although the focus is on habitats as ecosystem types, it is important to include species considered to be threatened. The primary aim of the South Australian Representative System of MPAs



Dolphin in Port River/Barker Inlet estuary (A Steiner).



**CUTTLEFISH MOORING BUOYS**

Two mooring buoys for recreational and charter vessels have recently been installed at Stony Point and Black Point to protect the giant cuttlefish. The giant cuttlefish, *Sepia apama*, travels to its breeding grounds at Point Lowly in Upper Spencer Gulf every year. It has been estimated that up to 41 000 individual cuttlefish visit the spawning site. This is the only known spawning aggregation of this size of giant cuttlefish in the world. The mooring buoys were provided by DEH, at a cost of approximately \$10 000, to assist ecologically responsible tourism in Whyalla and to protect the local reef ecosystem from anchor damage. DEH will also be developing a MPA, with an objective of conserving this species, during 2005.

This project was a joint initiative between DEH, Whyalla Diving Services, Whyalla Sports Divers Club and South Australian Aquaculture Management.

Cuttlefish.

is to develop MPAs that represent the diversity and complexity of South Australia's marine environments.

The 'Blueprint for the development of a South Australian System of Marine Protected Areas' (SARSMPA) policy statement stipulates ecologically sustainable multiple-use of MPAs, except where special conservation needs are identified for effective habitat or species management. The SARSMPA program has identified 19 locations within the State's eight bioregions for further investigation for MPAs. This system will contribute to the National Representative System of MPAs (NRSMPA).

The MPA Program will create, by statute, multiple-use marine reserves to complement the existing marine parks in South Australia, such as the Great Australian Bight Marine Park.

A pilot MPA is currently being developed with the assistance of a locally based consultative committee in the area between Encounter Bay, Backstairs Passage and the East Coast of Kangaroo Island. A management and zoning plan is being produced in consultation with stakeholders and the broader community.

**ACTION:**  
Protect representative areas of ecological significance as multiple-use Marine Protected Areas under the SARSMPA program.

In addition to SARSMPA, MPAs also include other marine protected areas identified as meeting the program objectives. For example, many of the existing Aquatic Reserves under the *Fisheries Act 1982* were established for the conservation of nursery grounds for prawns, crayfish, abalone and other commercial species while other aquatic reserves were established to protect particular reef and marine habitats.

**ACTIONS:**  
Protect critical habitats for fisheries management.  
Protect marine areas of regional significance.

### 2.1.3 Establish the Adelaide Dolphin Sanctuary

The proposed dolphin sanctuary in the Port River and Barker Inlet will improve protection for the dolphins. New legislation to establish the sanctuary will integrate uses and activities in the area and improve the health of the area. The new legislation will provide for:

- \* the protection of the resident dolphin population in Port River/Barker Inlet and environs;
- \* the sustainable use of this locality for commercial, recreational, environmental and social benefits for all South Australians; and
- \* the recognition of existing tenures that operate within an ecologically sustainable framework.

Existing Acts impacting on the management of the Port River/Barker Inlet area are to be amended to have regard to the objects and objectives for the Adelaide Dolphin Sanctuary.

**ACTION:**  
Create by statute a dolphin sanctuary in the Port River and Barker Inlet with the primary aims of protecting dolphins and improving the quality of this environment.

#### 2.1.4 Improve Protection of Threatened and Rare Species

The Government is committed to a 'No Species Loss Strategy' for South Australia. The statute that supports this strategy is the *National Parks and Wildlife Act 1972*. As it is now 30 years since this statute was developed, a review of these arrangements is timely.

A need exists to provide additional protection for threatened marine species, some of which are protected under national and international obligations. The Marine Species of Conservation Concern Working Group is developing a list of marine species of conservation significance in South Australia. The Working Group has developed a set of criteria for listing, modified from IUCN guidelines.

At this stage, rare, threatened and vulnerable species are likely to be protected under the existing Rare, Vulnerable and Endangered Species Schedules of the *National Parks and Wildlife Act 1972*. Currently, fish and marine invertebrates are protected under the *Fisheries Act 1982* and plants under the *Native Vegetation Act 1991*. Threatened Species Recovery plans are envisaged for any species listed as endangered. The recovery plans will set objectives for, and identify actions to achieve, species recovery.

##### **ACTIONS:**

Develop a list of threatened, rare and vulnerable marine species for legislative protection.

Cooperate with the Commonwealth and other States to develop and implement threatened species recovery plans for priority species.

#### 2.1.5 Develop 'NatureLinks'

The Government has recently launched 'NatureLinks' with the long-term aim of ecological restoration through the development of large-scale conservation projects. The goal of 'NatureLinks' is to conserve South Australia's species and habitats, in partnership with the community, by establishing ecological links across the land and sea. This involves managing South Australia's reserve system as 'ecological cores' on the land and in the sea, and developing partnerships between resource managers, such as farmers and the fishing industry, for the management of surrounding areas, and development of ecological linkages.

'NatureLinks' will be facilitated through planning and funding programs rather than through specific legislation, although the general principles behind 'NatureLinks' are likely to be included in any new biodiversity conservation legislation for the State. The Government's 'No Species Loss Strategy' for South Australia will integrate with this initiative.

#### 2.1.6 Protect Fish Breeding Grounds

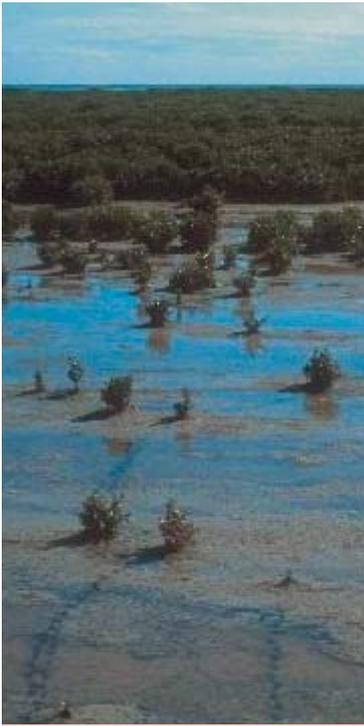
Collaboration with the fishing industry is essential to identify and protect important fish breeding grounds. PIRSA has recently released 'An Inventory of Important Coastal Fisheries Habitats in South Australia', which identifies fishing habitat types that require protection. The Government has been considering guidelines for commercial and recreational fishing use of sensitive marine habitats such as mangroves, saltmarsh and seagrass meadows. This aim has been partly achieved with the development of the Fish Habitat Handbook by PIRSA.

##### **ACTION:**

Identify and protect important fish breeding grounds in conjunction with the fishing industry.



Osprey chick, Port Lincoln (DEH).



Mangroves.

### 2.1.7 Protect Estuarine Habitats

The Estuaries Policy will make recommendations for the management and protection of estuarine habitats.

Flow-control mechanisms/structures in estuarine areas, such as the barrages near the mouth of the River Murray, should be operated to maximise ecological benefit. Current work being progressed by the Government includes provision of fish passage, automation of barrage gates, and the development of a Lakes and Coorong Operating Strategy.

#### **ACTION:**

Develop flow control mechanisms in the Murray Mouth area to maximise ecological benefit.

### 2.1.8 Protect and Manage Coastal Wetlands

Development continues to be proposed in coastal wetland habitats. Coastal wetlands are also vulnerable to sea level rise and room must be set aside to allow for retreat. Saltmarsh and mangrove habitats have recently been mapped and a report on their conservation status is being prepared.

On 2 February 2003, the Government released its *Wetlands Strategy for South Australia* providing a framework for actions to promote wetlands health and conservation, including coastal wetlands. It identifies those partnerships between Government, industry, private landowners, researchers and local communities that are important for managing wetlands across the State. The Government will be investigating the designation of significant coastal wetlands as Ramsar sites (Wetlands of International Importance) and Shorebird Sites of International Importance (on the East Asian-Australasian Shorebird Site Network).

Operational policies and management plans need to be prepared for all important coastal, estuarine and marine wetlands in South Australia, including all nationally important wetlands that are recognised in the Directory of Important Wetlands in Australia. A Marine and Estuarine Wetlands Conservation Strategy for South Australia has, in part, been progressed via the '*Wetlands Strategy for South Australia*'. The Estuary Policy (ref. Section 1.4) will address other components of this strategy.

#### **ACTION:**

Develop operational policies and management plans for the conservation of important coastal, estuarine and marine wetlands in South Australia.

### 2.1.9 Protect Significant Coastal Habitats

The protection of significant areas of coastal lands such as coastal dune and cliff-top habitats will be investigated, including the possibility of extending the representation of coastal habitats within the South Australian protected areas system.

Survey work has identified 50 plant communities and 1492 plant species in coastal dune and cliff-top habitats that are under threat from urban development, weeds and pest species and poor land management practices. A range of strategic actions is required to protect these habitats.

**ACTIONS:**

Investigate the addition of representative areas of coastal habitats to South Australia's protected areas system.

Form partnerships with local government and communities to better manage coastal habitats such as coastal dune and cliff-top habitats.

**2.2 Provide Formal Legislative Protection**

Currently gazetted local government seaward boundaries vary across councils with differing interpretations of 'low water mark'. Proposed amendments to local government boundaries to provide a consistent seaward boundary of astronomical low tide will clarify the jurisdiction of individual councils and ensure local government has greater control over activities in the coastal zone that impact on significant areas.

Formal protection for significant coastal Crown land, with options for vesting control of this land with local government or other bodies, subject to preservation of public rights, will also be pursued through amendments to the *Crown Lands Act 1929*. The proposed new Coast and Marine Act for South Australia will also provide greater protection for significant habitats. Significant habitats will be zoned in Marine Plans and guiding principles will be provided.

**ACTIONS:**

Amend the *Crown Lands Act 1929* to provide for single ministerial responsibility for care, control and management of Crown lands and improve efficiency and effectiveness in administering and managing the marine, coastal and river front Crown holdings.

Strengthen provisions under the *Crown Lands Act 1929* to enable effective management of Crown lands with significant conservation values.

For areas identified as being of high conservation significance, it may be appropriate to pursue specific dedication as protected areas under protected area legislation.

Legislation for the dedication of MPAs under the SARSMPA will also provide formal protection for significant marine habitats.

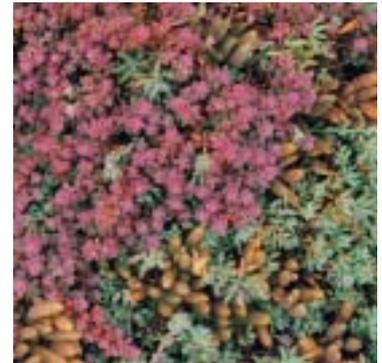
**ACTION:**

Develop legislative arrangements for the protection and management of MPAs under the SARSMPA.

The State NRM Plan under the proposed NRM Act will address coastal, estuarine and marine environments.

The *Native Vegetation Act 1991* applies to coastal and marine areas extending out to the three-mile limit in all areas of the State, excluding the metropolitan area. Amendments to the *Native Vegetation Act 1991* made by the *Native Vegetation (Miscellaneous) Amendment Act 2002* provides for increases in protection for remnant areas of native vegetation in metropolitan Adelaide by the listing of significant areas of native vegetation by regulation.

The Government is also committed to increasing penalties for the destruction of ecologically sensitive habitat such as coastal samphire communities, which are important areas for fisheries. This has been addressed through the *Native Vegetation (Miscellaneous) Amendment Act 2002* by providing increased penalties of \$100 000 as well as increased provisions under the civil remedies requiring areas cleared to be reinstated. The increased penalties will have more impact on those activities responsible for clearance of coastal habitat, including drainage activities, grazing and off-road vehicles.



Coast bonetriut (*Threlkeldia diffusa*) (pink), ruby saltbush (*Enchlyadena tomentosa*) (green) and round-leaved pigface (*Disphyma ciovellatum*) (buff) on East Franklin Island, St. Joseph Banks Group Conservation Park (P. Canty).



**ACTION:**

Regularly review penalties for the destruction of coastal and marine native vegetation.

2.2.1 *Develop and Implement New Biodiversity Legislation*

DEH is investigating a proposal for a Biodiversity Conservation Act for South Australia and a State Biodiversity Strategy, which encompasses coastal, estuarine and marine environments. The Strategy will identify management, research and monitoring policies required to protect South Australia's coastal, estuarine and marine habitats.

**ACTIONS:**

Develop a Biodiversity Conservation Act for South Australia.

Develop a State Biodiversity Strategy, which encompasses coastal, estuarine, and marine biodiversity.

2.3 *Rehabilitate Degraded Habitat*

Significant areas requiring rehabilitation (such as coastal dunes, samphire areas and seagrass meadows) will be identified through the Regional NRM Plans under the proposed NRM legislation. The proposed amendments to the *Crown Lands Act 1929* will also promote improved management of Crown lands.

The Government will also focus on improved management of protected areas.

**ACTION:**

Incorporate coastal, estuarine and marine rehabilitation into NRM Plans focussing on priority areas.

2.4 *Mitigate and Manage Invasive Species*

2.4.1 *Manage Coastal Pest Plants*

Some pest plant species have already established themselves along South Australia's coastline and represent a significant threat to coastal biodiversity.

A strategy is being formulated to manage the spread of pest plants and to prevent new species from establishing. The strategy will:

- identify priority pest plants;
- determine their extent and management requirements;
- prepare a plan and engage the community and local government to manage and eradicate priority pest plants; and
- ensure that there is rapid response to controlling and eliminating new pest plant species.

The control of coastal pest plants is an issue that will be considered by the Regional NRM Boards.

**ACTION:**

Address the spread of coastal pest plants and identify measures to prevent new species from establishing.

Dune onion weed (*Trachyantra divaricata*)  
(R Sandercock, DEH).

#### 2.4.2 Manage Marine Pest Species and Aquatic Animal Disease Emergencies

Biosecurity of our marine resources is vital if we are to continue to reap the benefits in terms of ecological services and resource use. Prevention, early detection and eradication is critical to avoid the large cost associated with marine pest outbreaks.

The risks and consequences of marine pest incursions can be catastrophic for fisheries, aquaculture and biodiversity conservation. The risk can be minimised through effective barrier control, detection and response, and monitoring and management of existing pest species.

A range of introduced species has been established in South Australian waters with approximately 20 species identified as marine pests in the 2003 State of Environment Report (SoE). However, there is currently a lack of information on this issue and a need for coordinated surveys and monitoring.

The Government is committed to the *Australian Ballast Water Management Strategy* at the State level and supports the development of Port Management Plans, which may assist in the early detection of introduced marine pests.

##### **ACTIONS:**

Lead the implementation of the *Australian Ballast Water Management Strategy* at the State level.

Lead the development of Port Management Plans.

Surveys for South Australia's major ports would assist the assessment of risks associated with shipping to and from these ports and in the development of port environmental management plans. Ongoing monitoring of high-risk areas (such as ports, marinas and artificial structures/wrecks) would reduce the time taken to detect an incursion.

In considering translocation, it is also important to target the domestic fleets, including recreational fleets, and hence it may be important to determine the status of marinas and significant mooring areas.

##### **ACTION:**

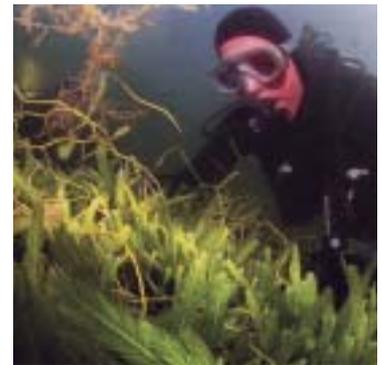
Encourage the undertaking of surveys of South Australia's major ports and marinas and assessment of the risks associated with shipping to and from these ports as the basis for development of port environmental management plans.

PIRSA plays an important part in this Government commitment, and is working to develop coordinated national management arrangements for barrier control, emergency response and management of existing pest species. These arrangements need to be finalised and implemented.

##### **ACTION:**

Develop and implement coordinated national management arrangements at State level for barrier control, emergency response and management of existing pest species.

Using community and stakeholder groups as an early warning system to report marine pest incursions is likely to significantly improve response time and minimise the impacts of any incursion. Stakeholders and the community should be educated and encouraged to report suspicious observations. For example, Reef Watch has begun to provide commercial dive operators with 'Feral and in Peril' kits to enlist the support of people diving on the HMAS Hobart to ensure that the sunken vessel is monitored for feral species.



*Caulerpa taxifolia* (G Adams, The Advertiser).

**ACTION:**

Develop and support community and stakeholder groups to assist as an early warning system to report marine pest incursions.

The *National Introduced Marine Pest Response Plan* and local emergency management practices need to be combined and reworked to develop a local response plan. Due to the diversity of potential pest species and incursion scenarios, this plan will need to be broad, with specific chapters on response options for known pest species.

**ACTION:**

Formalise local response plans based on the *National Introduced Marine Pest Response Plan* and local emergency management practices.

Whilst shipping can be regulated to some extent, the extension to the domestic/recreational fleet will require a focus on education and awareness.

**ACTION:**

Raise awareness of the risks and consequences of marine pest incursions.

Targeted research is required on the management and eradication of existing marine pest species in Australia and improved barrier control and response options. This should build on existing capabilities in relation to research and development on *Caulerpa taxifolia* and extend to include other high-risk species, such as the Northern Pacific sea star (*Asterias amurensis*) and the Japanese kelp (*Undaria pinnatifida*).

**ACTION:**

Develop the research capabilities in the state to provide information on the management and eradication of existing and potential marine pest species to South Australian waters.

PIRSA Aquaculture has developed an Aquatic Animal Emergency Response Plan, which outlines strategic responses for all the diseases currently listed as notifiable in South Australia. This plan has been developed to fit within the guidelines provided by the Commonwealth Aquaplan and Aquavetplan manuals for responding to aquatic animal disease emergencies. PIRSA Aquaculture has also developed a Draft Emergency Procedures Manual.

The Aquatic Animal Health Policy includes plans and aims for disease surveillance of important aquaculture species, the use of this surveillance data, and translocation protocols for aquatic animals that are shipped into South Australia. These policies form a framework that assists in protecting South Australia's coastal and aquatic fauna from disease incursions.

**ACTION:**

Revise the State Response Plan for management of aquatic animal diseases to include a greater number of species in surveillance programs and to support research to identify and control pathogens of aquatic animals.

Sabella worms (R Sandercock, DEH).

Aquaculture licence conditions dictate that farmers must take all reasonable precautions to prevent stock escape. All stock escapes must be reported to PIRSA immediately and where farms have had escapes, they now must have escape minimisation plans and stock recovery plans in place. There are also disease management protocols for farms and all diseases must be reported immediately.

**ACTION:**

Review effectiveness of aquaculture stock recovery plans and escape minimisation plans.

While there are protocols for dealing with escapes from aquaculture farms and fish farm health programs and protocols in place, the environmental impact of the escape of farmed species and the potential introduction of exotic pests and diseases through increased aquaculture requires ongoing investigation.

The Fisheries Research and Development Corporation (FRDC), in conjunction with SARDI, has recently funded a series of workshops on risk assessment for aquaculture. These are comprehensive and include risk and consequences of escapes, diseases, environmental impacts etc. The first two, tuna aquaculture and other finfish aquaculture, have already been held, and additional workshops on land based abalone and intertidal shellfish are planned.

**ACTION:**

Investigate environmental risks arising from the escape of farmed species including the potential for introduction of exotic pests and diseases.

## 2.5 Protect Indigenous Heritage

The *Aboriginal Heritage Act 1988* is administered by the Department of Aboriginal Affairs and Reconciliation (DAARE) and provides for the protection of Aboriginal sites, objects and remains that are of significance to Aboriginal archaeology, anthropology, history, and tradition. The Act defines a site as 'An area of land that is of significance to Aboriginal tradition, Aboriginal archaeology, anthropology, or history'. Sites likely to be found in coastal areas include:

- Archeological sites (campsites, shell middens, artefact manufacturing sites);
- Burial sites (historic or pre-contact);
- Quarry sites (stone tool, grindstone and ochre quarries);
- Stone arrangements (ceremonial, hunting hides, and fish traps);
- Mythological sites associated with dreamings; and
- Historic sites (missions, ration depots, birthplaces and fringe camps).

Any land, developed or undeveloped, can contain sites relating to living patterns and use of environmental resources such as water, animal and vegetable foods and stone by Aboriginal people and their sites relating to spiritual beliefs, and ceremonial activities.

Indigenous heritage in coastal and marine environments requires adequate protection and management. Areas of cultural heritage value often have natural heritage conservation values. Management of natural resources can impact on the cultural heritage values of an area and management planning should, in cooperation with Aboriginal people, incorporate identification of any cultural heritage values and plan for their conservation.

### 2.5.1 Maintain Effective Partnerships with Indigenous Communities

Natural resource managers require an understanding of the need to protect sites and the value that indigenous people place on them. Sites of significance may be unknown to non-indigenous people and consequently, unintentional damage can occur.



Head of Bight meeting (Yalata Land Management).



There is an ongoing need to establish and maintain strong working relationships with relevant indigenous communities and heritage committees. The effectiveness of such working relationships may result in better identification of the assets and values of an area.

**ACTION:**

Maintain effective communications with indigenous communities and relevant heritage committees to support on-going partnerships to protect sites of significance.

### 2.5.2 Facilitate Compliance with Relevant Indigenous Heritage Legislation

To ensure compliance with the *Aboriginal Heritage Act 1988* and to promote best practice in conserving Aboriginal sites of significance, the following processes should be followed:

- identify and record sites in the region to allow a better understanding what needs to be managed;
- conserve and monitor sites in the area, in cooperation with the appropriate Aboriginal groups and DAARE. Cultural heritage sites require conservation plans to guide appropriate management;
- before proceeding with any development or remedial works on land, the proponent should, in accordance with the procedures provided for in the *Aboriginal Heritage Act 1988*, undertake to identify whether there are Aboriginal sites in the area and take measures to avoid damage to them;
- consult Aboriginal people who have a traditional association with the land in the area to determine the appropriateness of jointly naming the reserve's features; and
- encourage and support cultural heritage surveys, which include archeological, anthropological and historic studies within the area.

DAARE provides advice to ensure compliance with the *Aboriginal Heritage Act 1988* and to promote best practice in conserving Aboriginal sites of significance.

**ACTION:**

Provide advice to enable recognition and protection of indigenous heritage and to promote best practice management of indigenous heritage sites.

## 2.6 Protect European Heritage

A key issue is to maintain where possible, or at least minimise, the deterioration of the physical condition and hence heritage value of maritime heritage places. DEH's Heritage Program encompasses land and underwater sites associated with South Australia's maritime heritage. Land sites include lighthouses, jetties, wharves, navigational aids, and whaling stations, while underwater sites are predominantly shipwrecks.

### 2.6.1 Protect Maritime Heritage Assets

It is important to encourage the conservation of the State's maritime buildings, structures and sites and to ensure linkages between actions in State and Commonwealth waters. Compliance with the provisions of the Historic Shipwreck legislation (State and Commonwealth) is required.

**ACTION:**

Locate and maintain mooring buoys at significant sites to prevent damage to cultural and natural heritage.

Lighthouse at Cape du Couedic,  
Flinders Chase National Park (S Barker).

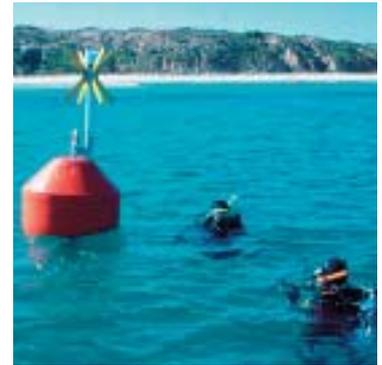
### 2.6.2 Improve Public Awareness of Maritime Heritage

A public awareness campaign is needed to generate an understanding of maritime heritage. Raising community awareness and educating the community about shipwrecks is an important part of the maritime heritage program. Activities carried out include the in situ interpretation of shipwreck sites, such as the eight maritime heritage trails established in South Australia. The heritage trails include Adelaide's Underwater Heritage Trail, Wardang Island Maritime Heritage Trail and Investigator Strait Maritime Heritage Trail, Garden Island Ships' Graveyard Maritime Heritage Trail, Kangaroo Island Maritime Heritage Trail, Port Elliot Maritime Heritage Trail and Southern Ocean Shipwrecks Trail.

Other activities include publications in the form of technical reports, booklets and brochures and the establishment of museum displays and education kits through regional and State museums.

#### South Australian Moorings Program

A \$288,000 project, jointly funded by the State and Federal Governments, has provided long term protection for some of South Australia's most important shipwreck sites. The South Australian Moorings Program, carried out by Heritage SA, has protected 10 of the state's key historic wrecks by installing buoys which recreational and charter boats can attach to instead of using their anchors. Anchors can cause significant damage to historic shipwrecks if they drag through, or become attached to, the wrecks themselves. They can also damage fragile marine ecosystems. To address this problem, Heritage SA has spent three years setting up buoys and providing interpretive signage at relevant sites around the coast. The mooring buoys will make it easier to locate the wrecks and enable boats to be made fast without harming the site. The addition of interpretive signs on land near some of the sites will also help people to understand our maritime heritage and to value the wrecks themselves. The South Australian Moorings Program has installed mooring buoys at the following shipwreck locations – five around Wardang Island in the Spencer Gulf, (Australian, Songvaar, Investigator, MacIntyre and Moorara), one off the north-west coast of Kangaroo Island (Portland Maru) and four in Gulf St Vincent (Star of Greece off Port Willunga, Norma off Semaphore, and Zanoni and a barge off Ardrossan). Interpretation signs have also been installed at Ardrossan, Port Victoria, North Haven and Port Willunga.



#### CURRENT STATUS

DEH has developed a website to provide comprehensive information about deliberately abandoned vessels in South Australian waters.

It includes location maps and descriptions of 19 identified sites; fact sheets with histories and photographs for all known graveyard vessels; and access information for visiting the sites. The remains of these vessels are important educational, recreational and tourism assets.

The ships' graveyards website, a world first, is available at: [www.environment.sa.gov.au/heritage/ships\\_graveyards/](http://www.environment.sa.gov.au/heritage/ships_graveyards/).

Star of Greece mooring (T Arnott, DEH).



### IMPACT OF POLLUTION

It is estimated that 720 hectares of seagrass have been lost along the Adelaide coastline between 1995 and 2002. This is in addition to the 5000 hectares of seagrass previously lost off the metropolitan coastline since 1935. The largest areas of apparent loss in Gulf St Vincent have occurred in the vicinity of effluent outfalls due to the impacts of pollution. Mangrove communities have also decreased in selected locations adjacent to sources of pollutants. Dieback of at least 250 hectares of mangroves has occurred around the Bolivar sewage outfall since the 1950s. In addition, much larger areas in the vicinity of Bolivar are in poor health. The tidal wetlands in this region provide the most important nursery area for fish species in Gulf St Vincent and their loss and declining health could have significant impacts on the abundance of these species. Other localised sites of concern for mangroves include areas around Port Augusta, Point Davis near Port Pirie, and some areas along the West Coast, such as Tourville Bay.

A recent study of reefs along the Adelaide metropolitan coastline found that they were generally in good condition in southern areas around Aldinga and Moana and moderate condition in central areas around Noarlunga. Those in northern areas such as West Beach and Semaphore are the most heavily affected by discharge from urban stormwater and wastewater treatment plants and the Torrens and Patualong Rivers. The effects of pollution can be seen in altered compositions of the macroalgal flora on the reefs.

Posidonia sp. along the Adelaide metropolitan coast  
(V Neveruskas, PIRSA Marine Habitat Program).

## OBJECTIVE 3. TO CONTROL POLLUTION OF OUR COASTAL, ESTUARINE AND MARINE ENVIRONMENTS

Pollution is the major risk to our coastal, estuarine and marine environments. It impacts both directly and indirectly, predominantly through decline in water quality and therefore habitat health and biodiversity. Point source discharges from industries, wastewater treatment plants (WWTPs) and major stormwater outlets contribute nutrients, pathogens, pesticides, heavy metals, petrochemicals, sediment and thermal pollution.

Diffuse pollution occurs along the coastal and river interfaces with land. Nutrients may be carried by land run-off and groundwater, and may be concentrated by the local watershed or specifically sourced from individual boats through waste and anti-foulants. Diffuse pollution contributes significant pollution loads to coastal waters, particularly nutrients, pesticides, heavy metals, pathogens, and sediments. The sources of diffuse pollution are often a considerable distance from the coast. It is therefore critical that close planning and operational linkages are formed between coastal and inland water management agencies to address diffuse pollution sources.

The release of excessive nutrients into the estuarine and marine environments can result in algal blooms and eutrophication with consequent impacts on marine organisms, including the promotion of epiphytic growth on seagrass blades causing the seagrass to be smothered. Consequential impacts on commercial and recreational fishing are already a serious concern and could potentially be devastating.

Mangroves and tidal wetlands are ecologically important due to their high productivity and ability to trap and stabilise marine sediments. They are also important nursery areas for many marine species including commercial and recreational fisheries. Some of these wetlands are contracting in area and the health of the mangroves is declining largely as a result of sewage effluent discharge into the area.

Stormwater discharges are often high in suspended solids, which can reduce water clarity. Increased turbidity in estuarine and marine waters is an important issue in relation to benthic productivity, since many seagrass and algal communities have evolved in, and depend on conditions of high light penetration (low turbidity).

Pollutants also diminish the recreational and amenity values of the coastal waters. In the near-shore metropolitan area between Kingston Park and North Haven, seagrass loss exacerbates sand movement, particularly along the Adelaide beaches, and reduces their amenity. Conversely, dredging to manage erosion has introduced turbidity loads to local waters. Pollution of waters by micro-organisms from human and animal faecal wastes can compromise swimmers' health and aquaculture of shellfish such as oysters.

While the aquaculture industry has developed rapidly, information on the environmental impacts of aquaculture is incomplete. Monitoring up to now has indicated low impact, although a large increase in aquaculture represents a pollution risk as nutrient levels can elevate when large numbers of a marine species are farmed in a small area.

Litter and other debris in the coast and in the marine environment impacts on coast and marine species as well as being a nuisance and reducing the amenity value of the coast.

Other key marine issues to be addressed include inadequate ballast water management and sea dumping.

### STRATEGIES

#### 3.1 Conduct Risk Assessments

A comprehensive risk management process is required to identify and prioritise coastal, estuarine and marine environments at risk from pollution, leading to effective management, remediation and a clear focus by Government and industry.

**ACTION:**

Identify and prioritise risks to the coastal, estuarine and marine environments from pollution.

The EPA has established the Adelaide Coastal Waters Study in response to a number of major environmental concerns about the coastal waters near Adelaide. The study is focussing on seagrass loss, seafloor instability and water quality degradation resulting from large-scale modification of the coast and discharges into eastern Gulf St Vincent. It will provide new knowledge and understanding of chemical, physical and biological processes to support sustainable management options. It will identify key threatening processes to coastal water environmental values and options to minimise impacts. The study will also provide a program to assess the effectiveness of management actions (including monitoring program) and strategies to communicate results.

**ACTION:**

Implement the findings from the Adelaide Coastal Waters Study.

### 3.2 Reduce Land-Source Pollution

It is vital for the health of coastal, estuarine and marine environments to remove input pollutants from land-based discharges in order to maintain high water quality. Land-based point and diffuse source pollution must be reduced and investigations undertaken to explore innovative reuse to protect water quality.

Increasing effort by Government will also reduce pollution in the Port River in partnership with local industry. Levels of pollutants should be reduced to below the ANZECC (2000) water quality guidelines.

Diffuse source pollutants entering coastal, estuarine and marine environments are of particular concern in the South East (from drainage of land via the River Murray) and the Gulf St Vincent (from watercourses and stormwater drains).

The State Water Plan 2000, under the *Water Resources Act 1997*, specifies that a wastewater management statement be established to set out a consistent framework for wastewater management and reuse in South Australia.

SA Water is undertaking statutory Environment Improvement Programs (EIPs), which involve upgrading WWTPs to minimise high nutrient sewage discharge into the marine environment. Preferably, this should be achieved by re-using wastewater for irrigation, or alternatively by nutrient removal (where re-use is not economically and environmentally possible) to improve the marine habitat. The target is to divert at least 40 per cent of the discharge from WWTPs that is otherwise released into Gulf St Vincent to re-use on land.

**ACTION:**

Minimise high nutrient effluent discharge to the marine and estuarine environment from major wastewater treatment plants.

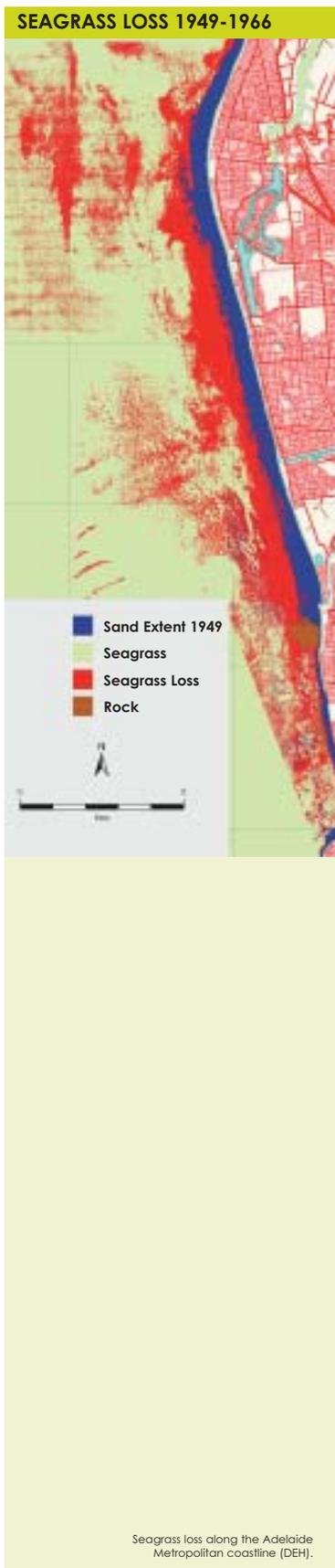
The productive use of nutrient-rich effluent is being promoted with the long-term aim of eliminating effluent discharges to the marine environment. DWLBC is partnering other Government agencies to increase the use of recycled effluent through Aquifer Storage and Recovery (ASR) thereby reducing marine discharges in the Adelaide region. This is being done in partnership with the CSIRO, SA Water, Salisbury Council and industry through trials north of Bolivar.

**ACTION:**

Increase the use of recycled effluent and reduce marine discharges through continuing partnerships between DWLBC, other Government agencies, local councils, CSIRO and industry.



Barcoo Outlet (EPA).



The State Water Plan 2000 recommends that a stormwater management statement will set out a consistent management framework for major stormwater systems by 2005. The statement will recognise stormwater as a strategic resource, including emphasis on environmental management, water quality objectives and economic opportunities.

Catchment Water Management Boards/Regional NRM Boards and local government need support in the development of integrated water quality and stormwater management strategies including beneficial re-use programs to minimise discharge into the marine environment. Increasing emphasis is required on whole-of-catchment management involving local communities and on-property use or disposal.

Catchment Water Management Boards have adopted new or updated catchment water management plans, largely giving additional recognition to the ecological impacts associated with effluent and stormwater.

**ACTIONS:**

Actively encourage Catchment Water Management Boards/Regional NRM Boards and local government to develop integrated water quality and stormwater management strategies.

Implement strategies to reduce diffuse pollution of watercourses and stormwater drains discharging into marine waters.

The Water Proofing Adelaide strategy considers the impacts and opportunities for better managing the total water resources available to the Adelaide region, including opportunities for increased stormwater use and effluent recycling. It will also consider the needs of the environment and the impacts of stormwater run-off and effluent discharges on the marine environment.

**ACTION:**

Implement the Water Proofing Adelaide strategy, which will provide a strategic blueprint for water resource management in the Adelaide region for the next 25 years.

The recently released Environment Protection (Water Quality) Policy 2003 and associated codes of practice provide additional impetus to deal with diffuse pollution and improve stormwater quality. The policy sets out a code of practice for local, State and Commonwealth Government agencies as well as for industry. It provides a consistent State-wide approach to the protection of water quality across all water bodies. Environmental standards specified in the Water Quality Policy are designed to be consistent across the State's aquatic environments and are closely linked to national strategies.

**ACTION:**

Develop Codes of Practice linked to the Environment Protection (Water Quality) Policy to address the management of diffuse pollution sources and improve stormwater quality.

**3.3 Minimise Marine Pollution**

**3.3.1 Improve Environmental Management of Aquaculture**

The aquaculture industry continues to develop rapidly and is diversifying and becoming more important economically. Understanding of the environmental consequences to the marine environment from aquaculture is slowly accumulating. Aquaculture in South Australia is a highly regulated industry with extensive licence provisions and ongoing monitoring requirements. Much of the information on the marine environment gathered to date has been acquired through monitoring by the aquaculture industry.

There has also been a commitment to undertake significant research into the environmental impacts of aquaculture, marine mammal interactions and disease mitigation through FRDC and CRC projects over the next five years. Additionally, research and development is continuing into improving the models and developing new technologies to detect impacts.

The environmental impacts of aquaculture activities must be determined and environmental considerations must be paramount in assessing new aquaculture ventures.

#### **ACTIONS:**

Continue investigations into the environmental impact of aquaculture activities and ensure environmental considerations are paramount in assessing new aquaculture ventures.

Require the aquaculture industry to monitor and, where necessary, modify existing farm practices.

#### **Minimising Environmental Impact of Aquaculture**

The potential for environmental impacts from aquaculture are investigated before new aquaculture zones are made available. PIRSA undertakes extensive field studies on factors such as currents and water quality, and then applies carrying-capacity models to determine how many animals, if any, can be farmed in a given area. A large component of the capacity is left to environmental needs of the system. Environmental monitoring indicators are then used as a check of the model to ensure any area is not overstocked. Benthic communities are assessed during the regional technical investigations, by field assessment during the application process, and again by annual benthic videos as part of the environmental monitoring requirements of the operator.

All aquaculture sites, including land-based sites, are required to submit annual environmental monitoring reports. Tuna aquaculture sites have submitted reports for several years that have indicated no impacts on water quality or benthic sediments. Oyster farmers have previously participated in a program that has shown no significant impact on the environment, including seagrasses. Impacts identified were mainly from old technology that is no longer approved for use.

An audit of all Environmental Management Plans is being undertaken by SARDI and programs will be revised in accordance with any recommendations. The introduction and application of the *Aquaculture Act 2001* has seen a much greater role in scrutinising aquaculture licenses by the EPA. The Act requires licence applications, variation of licence conditions and lease conversions to be referred to the EPA to ensure aquaculture activities continue to develop in an environmentally sustainable manner.

#### **3.3.2 Manage Ballast Water and Oil Spills**

The Government is committed to implementing the Australian Ballast Water Management Guidelines. These guidelines will reduce the risk of marine shipping incidents and pollution events in South Australia's ports and in State waters. Implementation will be in conjunction with the Commonwealth, other State jurisdictions and New Zealand, and provide information to visiting ships about possible regional impacts of their practices.

#### **ACTION:**

Support implementation of the Australian Ballast Water Management Guidelines at the State level.



Oil spill clean up (Transport SA - Marine Group).

**CURRENT STATUS**

Legislative changes to the structure of the EPA have given the new Authority greater independence. The new EPA has an expanded board, to give it a broader range of expertise, and the Chief Executive of the EPA becomes Chair of the Board. The changes will also effectively double penalties for major offences under the *Environment Protection Act 1993*, such that they will be the benchmark in Australia and send a signal to offenders that the Government is serious about protecting the environment.

The EPA is pursuing initiatives to reduce stormwater pollution. It is revamping its Stormwater Pollution Prevention Codes of Practice into a consolidated Stormwater Code with associate guidelines for specific industries. Work continues with the building and construction industry as the focus industry in the first instance.

SA Water is currently targeting 30 per cent effluent re-use at metropolitan WWTPs and 24 per cent at county WWTPs by 2005. Currently, only 15 per cent of South Australia's wastewater is recycled and very little of its stormwater. The metropolitan Environment Improvement Programs are close to completion and the Port Adelaide WWTP is planned to be decommissioned in 2004-05 with wastewater being redirected to upgraded facilities at Bolivar.

A number of Catchment Water Management Boards and local government initiatives that make better use of stormwater and wastewater are being undertaken with DWLBC support. These include wetlands/ASR projects to reduce the amount of polluted stormwater discharged into the sea. ASR is being used at Andrews Farm, Morphettville Racecourse, and Oaklands Park as a means to re-use stormwater. Similarly, the Mawson Lakes residential development completely recycles its stormwater via ASR. Catchment Water Management Boards are investigating areas for ASR (such as the Adelaide Parklands, golf clubs, Warriparinga, and Shepherds Hill) but the number of areas available is limited, which reduces the application opportunities for ASR.

Catchment Water Management Boards and local government have undertaken significant education and capital works programs to improve water quality, including the construction of numerous major

Continued over page

The Ballast Water Decision Support System, implemented in July 2001, will be upgraded and expanded over the next few years. The Ballast Water System is under review nationally (co-ordinated by NIMCOG) and will provide a national directive. Individual State reviews are intended to follow. Any requirements to be placed on ports will need to have a legal basis and be cognisant of the requirements of contractual arrangements between the Government and the private port operators.

**ACTION:**

Review and expand the Ballast Water Decision Support System and incorporate into State legislation as necessary.

The Commonwealth manages the standards relating to construction and safety of tankers. State port controls exist under international arrangements. For example, if a ship is not complying with the international standards, it is detained in port until inadequacies are remedied.

Vessels must also comply with State controls relating to environmental safety standards, for example speed controls. While the Government cannot ensure compliance, it will endeavour to ensure that all tankers entering South Australian waters meet the highest international standards of construction and operations through fostering, promoting and encouraging vessels to comply. This could be pursued through the shipping agents/companies that contract vessels to work in South Australian waters.

**ACTION:**

Endeavour to ensure that all tankers entering South Australian waters meet the highest international standards of construction and operations.

The National Plan to Combat Pollution of the Sea by Oil and Other Noxious and Hazardous Substances (NATPLAN) is the responsibility of Transport SA. The aim of NATPLAN is to be prepared for, and respond to, spill incidents in the marine environment from any source. The committee has broad Government and industry representation and has been an extremely effective inter-agency collaborative arrangement for the control and mitigation of marine spills. The South Australian Marine Spill Contingency Action Plan (SAMSCAP) is the plan used to respond to a marine spill incident and is referred to in the Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987.

The Government is committed to ensuring that those responsible for oil spills meet all the costs (including environmental rehabilitation and monitoring costs). The Inter-governmental Agreement on the National Plan to Combat Pollution of the Sea by Oil and Other Noxious Substances, signed on 24 May 2002, includes the process for recovering clean-up costs from the polluter. However, where it is not possible to identify the polluter, the State has to cover these costs. There are currently no arrangements in place for recovering costs of environmental rehabilitation or monitoring.

**ACTION:**

Ensure that all costs from oil spills, including environmental rehabilitation and monitoring, are met by those responsible.

In addition, moves are being made at the national level to adopt Annex IV (the Prevention of Pollution by Sewage from Ships) of the International Convention for the Prevention of Pollution from Ships (MARPOL) ahead of international ratification. If this occurs, proposals will be put to State Parliament to adopt this Annex in the *Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987*.

**ACTION:**

Subject to the Commonwealth adopting Annex IV (the Prevention of Pollution by Sewage from Ships) ahead of international ratification, adopt the Annex in the *Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987*.

Marine spills are subject to cost recovery models supported under the international MARPOL arrangements, which provide for all clean up costs and the cost of rehabilitation to the greatest extent practicable. While costs associated with determining the fate of oil are covered, the costs of medium and long-term monitoring are not. These types of monitoring are a State/industry cost. Part of the role of the Environment and Scientific Coordinator under the SA Marine Oil Spill arrangements includes the coordination of post-spill monitoring.

The State has also adopted the MARPOL Annex V, which is for the Prevention of Pollution by Garbage from Ships and relates to many State-registered fishing and trading vessels.

It is important to improve compliance and the Government has committed to giving the EPA the authority it needs to protect gulf waters effectively.

**ACTION:**

Give the EPA effective and necessary authority to protect gulf waters from pollution.

**3.3.3 Control Sea Dumping**

The South Australian *Environment Protection (Sea Dumping) Act 1984* was passed by Parliament to mirror Commonwealth legislation but has not been proclaimed. The regulation of sea dumping in coastal waters currently rests with the Commonwealth by virtue of the Commonwealth Act overriding any South Australian legislation in the Constitution.

The EPA is currently reviewing the South Australian Act to align it, with subsequent modifications, to Commonwealth sea dumping legislation. It is anticipated that the amended Act will be proclaimed in 2004 to address current legislative shortcomings.

**ACTION:**

Review and proclaim the Environment Protection (Sea Dumping) Act 1984.

The Commonwealth Minister may declare that a State exercise regulatory control over its coastal waters where the State is able to demonstrate compliance with relevant international law and other requirements. South Australia will seek to obtain such a declaration for coastal waters within the control of the South Australian Government by demonstrating compliance with the London Protocol.

**ACTION:**

Negotiate with the Commonwealth to bring coastal waters within the control of the South Australian Government by demonstrating compliance with the London Protocol.

**3.3.4 Control Dredging**

Dredging can have an effect on marine pollution by stirring up fine clay and silt and, depending on currents can create significant plumes. Similarly, dumping of sand on beaches for beach replenishment can create significant plumes of very fine clay material if inappropriate sand material is used.

**ACTION:**

Control dredging to reduce impact on the marine environment.

**CURRENT STATUS - CONT'D**

wetland, erosion control works and stormwater pollution prevention projects with industry.

Planning SA has released a package of draft documents on urban stormwater prepared in conjunction with the Patawalonga and Torrens Catchment Water Management Boards. These documents provide information for improved stormwater planning for the councils within these areas.

Port Augusta and Whyalla Councils have been investigating the viability and potential for water recycling in the northern Spencer Gulf.

A Water Conservation Education Manual has been drafted to assist local government to work with their communities to reduce water demand through providing information on:

- use of roof run-off;
- water re-use options and policies;
- costs and benefits of rainwater tanks;
- how to implement a water conservation program with local communities; and
- how councils can reduce their own water use through adopting a systematic approach to operational and strategic planning.

The Government has announced that rainwater tanks will be mandated for new residential development from 2006. This as expected to reduce stormwater discharges in urban areas in the long term which will also reduce pollution to receiving waters.

In 1996 the ANZECC Standing Committee on Environment Protection published the ANZECC Strategy to protect the marine environment: Working together to reduce impacts shipping operations. One of the key issues addressed in the Strategy was that of marine debris from shipping and boating. A national marine debris brochure was produced, in consultation with States, Territories and the Commonwealth, which contains guidelines on how to conduct beach surveys and cleanups, and how to collect, collate and record useful data to assist community groups in carrying out surveys of marine debris on beaches. The WWF are the custodians of resultant data.



#### **OBJECTIVE 4. TO PROTECT OUR COASTAL, ESTUARINE AND MARINE ENVIRONMENTAL ASSETS**

The South Australian coastline has high amenity value and includes high quality landscapes. The significance or quality of landscapes is derived from a combination of landform, land cover, land use, water, diversity, naturalism and colour. It is important that South Australia's landscapes and amenity are adequately protected.

South Australia has a history of coastal development resulting in major habitat loss, particularly of coastal wetlands, dune systems and seagrass communities. Development within the metropolitan area, with its associated stormwater and wastewater discharges, has caused seagrass loss with significant ecological and economic consequences. The loss of seagrass has subsequently exacerbated the natural process of beach erosion, which has resulted in the need for sand replenishment and engineering works along the coast to prevent coastal recession.

Coastal development is subject to the hazards of flooding, erosion and acid sulfate soils. Coastal erosion is a natural feature of the dynamic coastal environment, whereby beaches erode, prograde or are in dynamic equilibrium. Cliffs erode and low-lying land is periodically flooded during storm-surge events. The level of risk will change over time in part as a response to climate change (global sea-level rise and the increased magnitude and frequency of extreme events such as storm-surge) and partly from natural uplifting and subsidence of land.

In regional areas, the pressures on beaches and dunes are less intense. Notwithstanding this, many beaches, dunes and coastal lagoons have been affected by farming methods, grazing by animals and misuses such as uncontrolled access by four-wheel drive vehicles. A significant problem for dunes and beaches occurs where development and land division has occurred in a linear fashion along the coast. Shacks, formerly on Crown land, which have been granted freehold, are a significant issue in a number of regional areas as they are often located on fragile dunes and beaches very close to the sea. As a result, there are issues associated with the protection of these shacks from coastal erosion and flooding as well as their impact on public access to the beaches.

It is important to manage existing development and prevent further inappropriate coastal development, particularly considering the high protection costs associated with managing the latter. Also the consequences of cumulative development and linear development on coastal landscape quality is a significant issue. Resolving these issues must be a joint responsibility for State and local governments and the community.

Compliance enforcement in coastal, estuarine and marine environments is currently an area of concern. Compliance issues are the responsibility of a number of authorities, including Planning SA, the Development Assessment Commission, the EPA, PIRSA Fisheries, Coast Protection Board, DEH, Transport SA and local government. There is a need to clearly define compliance issues, responsible agencies and resources.

Any coastal development, development controls, management strategies or construction of infrastructure, will also need to take account of Aboriginal heritage and native title issues.

#### **STRATEGIES**

##### **4.1 Develop a Strategic Vision for Coastal Development**

It is important to develop a 'vision' of what the South Australian coast - as a significant area of the State with high ecological, social and economic values - should be to enable all stakeholders (State/local government, community) to work towards this common goal. The State Government needs to be more specific in regard to what areas will be kept development free, where development should be focussed, what coastal use is appropriate and where resources should be concentrated.

East Franklin Island,  
Nuyts Archipelago Conservation Park (P. Canty).

As a priority, there is a need to identify high-quality landscapes at risk from development on the coast. The vision, to be developed in conjunction with local government and the Commonwealth, would provide policy directions and principles addressing a range of coastal land management aspects including view scapes, significant ecosystems, coastal hazards, sea-level change, public access, indigenous and non-indigenous heritage values and linkages with the marine environment.

The coastline has high amenity value and includes high-quality landscapes that need to be protected.

**ACTIONS:**

Develop a clear strategic vision for the State on coastal planning and development.

Identify quality landscapes on the coast at risk of development.

Protect landscape qualities and amenity values through appropriate policies in Development Plans through the Plan Amendment Reports process.

#### 4.2 Protect Coastal Assets

Coastal hazards are of serious concern in coastal, estuarine and marine environments. It is essential to build on our understanding of coastal processes and impacts to manage the coastal environment effectively.

Ongoing monitoring of the coastal environment is critical to identify and enable remediation of any impacts. The Coast Protection Board conducts regular surveys of the State's coast to measure geomorphological processes and determine management requirements (such as beach replenishment) and to guide development assessment.

**ACTION:**

Determine risks to South Australia's coastal assets from physical changes through surveys and monitoring programs.

A risk assessment approach to coastal hazards is required. High-risk areas will be identified in conjunction with local government and used to guide planning, development and protection.

**ACTIONS:**

Undertake a risk assessment of coastal hazards such as coastal erosion, flooding, cliff collapse and coastal acid sulfate soils.

Develop a Coast Protection Strategy for the whole of the South Australian coast.

Climate change has the potential to have major impacts on coastal, estuarine and marine environments. Changes in temperature, precipitation, sea-level, wind and climate patterns may all be associated with climate change. Wetlands, estuaries, reefs, beaches and dune systems and other sensitive coastal ecosystems are particularly vulnerable to the impacts of climate change. Increased coastal hazards are expected from resulting changes in coastal processes. These will affect infrastructure in the coastal zone and the economic base of coastal communities. Climate change will also have major implications for fisheries and other coastal dependent industries.

**ACTION:**

In conjunction with local government and the Commonwealth, develop a clear policy for Government to manage sea-level change.



Sand management on the Adelaide metropolitan coast (A Eaton, CPB).



Coastal acid sulfate soils (CASS) are potentially present throughout many low-lying coastal regions of South Australia. The release of leachate from acid sulfate soils can kill fish and cause corrosion of infrastructure and buildings or other structures. Remediation techniques for acidic areas are currently under investigation.

The Coast Protection Board has approved an interim strategy for CASS: A 'Strategy for Implementing Coast Protection Board Policies on Coastal Acid Sulfate Soils in South Australia'. The strategy establishes guidelines for development in CASS areas, as well as mitigation and remediation management options. This strategy has been developed through the CASS Program (Commonwealth and State Government partnership) to assist South Australian Government agencies, individuals and organisations with the identification and management of CASS. The strategy will need to be endorsed by the State Government, adopted by appropriate sectors of government and ultimately incorporated into relevant Development Plans. Relevant policies from the Strategy will be included in the Natural Hazards sections of the draft Metropolitan and Inner Region Planning Strategies.

**ACTION:**

Establish principles for development in coastal acid sulfate soils areas to guide coastal development.

State and local governments will work with owners of at-risk properties to develop coast protection strategies and identify funding sources. These may include grants from Government to assist groups and councils to put protection strategies in place.

**ACTION:**

Provide technical advice to support property owners in developing coastal protection strategies for at risk properties.

The State Government is committed to working with local government to manage and protect beaches from coastal erosion. Works include beach replenishment, dune and cliff stabilisation and improving management of public access to sensitive dunes and other coastal areas (such as cliffs and samphire areas), and construction of protection infrastructure such as seawalls.

**ACTION:**

Provide technical advice and assistance to local government to manage coastal erosion and public access to coastal areas.

The Coast Protection Board provides grants to local government to conduct coastal management activities. These may include beach replenishment and construction of hard protection works where necessary, maintenance of existing structures and funding for associated sand management activities.

The Adelaide Metropolitan Coast Protection Strategy has been successfully implemented for 30 years, but relies on economic supplies of suitable sand for beach replenishment. Traditional sand sources have been exhausted and available sand is likely to cost considerably more.

Alternative management strategies are being considered such as 'sand slowing' (using structures) and sand recycling techniques, such as dredging or pumping through pipelines. A range of social, environmental, economic and technical feasibility studies is being conducted, including surveys of beach users, an investigation into the values of the coast and detailed investigations into the physical processes along the Adelaide coast.

Coastal development at Mt Camel beach,  
Eyre Peninsula (T Huppatz, DEH).

**ACTIONS:**

Review the Adelaide Metropolitan Coast Protection Strategy.

Manage erosion risks to Adelaide metropolitan coastal assets by maintaining beach replenishment and using structures to slow littoral drift.

#### 4.3 Establish Effective Development Controls

Development Plans outline the type of development that is appropriate in coastal areas. Where development approval is granted, the relevant planning authority has the power and responsibility to ensure that the development is carried out in accordance with approved plans.

The vision for coastal areas will be reflected in the Planning Strategy as it is reviewed and updated. Under the *Development Act 1993*, amendments to Development Plans, through Plan Amendment Reports, must be consistent with the provisions of the Planning Strategy.

Effective control is fundamental to prevent and manage inappropriate coastal development. New development, which is subject to a coastal hazard or which disrupts coastal processes, can be guided by the *Coast Protection Act 1972*. However, controls are needed to govern rebuilding in coastal hazard areas.

It is crucial to ensure adequate compliance controls for local councils and the State Government with regards to planning and coastal development.

**ACTIONS:**

Ensure coastal zoning is undertaken with regard to the vision for coastal areas, including ecological, social and economic values.

Provide for an Authority with greater powers of direction over coastal and marine development.

Ensure adequate compliance controls for local councils and the State Government to deal effectively with planning and coastal development.

SATC has endorsed the South Australian Tourism Plan 2003-2008, which identifies strategies to develop integrated coastal experiences predicated on the values of sustainability, innovation and the appreciation of coastal environments. The plan refined principles contained in the draft South Australian Coastal and Marine Tourism Strategy (June 2002), which provided an environmentally responsible framework for coastal and marine tourism development and management by both the private sector and government.

As indicated in Section 1.5.11, SATC has developed as an aspect of the tourism plan, a Sustainable Tourism Package (STP), to foster planning policy and decision-making that facilitates sustainable and innovative tourism development and ensures our cultural heritage and natural environment are protected. The STP will ensure that public and private stakeholders are clear and confident about what constitutes appropriate and sustainable tourism development. An initiative of the STP is to prepare a 'Developers' Guide to Sustainable and Innovative Tourism Development' that will provide examples of various 'best-practice' aspects of existing tourism developments (including coastal tourism) within Australia and promote the adoption of performance criteria and design innovations by the tourism industry within the State.

**ACTION:**

Implement an environmentally responsible framework for coastal and marine tourism development management by both the private sector and government.

**CURRENT STATUS**

Profile lines extending from above high water and up to five kilometres offshore are regularly resurveyed to measure dune, beach and seabed change. This information is used to detect hazards and to develop management strategies. Aerial oblique photography is also extensively used to monitor changes along the South Australian coastline.

The development of Semaphore Park offshore breakwater trial has taken nearly four years, commencing with a strategy review in 1999-2000. Comprehensive community consultation and public information programs have been ongoing throughout the project. The breakwater will provide much needed protection for the eroding foreshore at Semaphore Park by collecting sand, which can be used for beach replenishment, as well as providing direct protection from erosion. It will also provide data on the performance of an offshore breakwater on the Adelaide coast. Construction began in September 2003 for completion in April 2004. The trial period will extend until 2007-08 during which time intensive monitoring of the trial breakwater and its effect on the coast will occur.

A breakwater to provide protection to the Beachport foreshore and remnant seagrass beds as well as improve safety for boat launching at the boat ramp in most sea conditions has been constructed.

The Cities of Port Pirie, Port Augusta and Port Adelaide and Enfield in conjunction with the Coast Protection Board are assessing the risk of seawater flooding and progressively implementing protection measures.

The City of Onkaparinga in conjunction with the Coast Protection Board is undertaking a risk assessment of cliff stability along its coastline with a view to a priority based cliff stabilisation program.

Beachport breakwater construction (S Delmar, DEH).



#### 4.4 Establish Effective Management of Coastal Lands

A review of the local government coastal boundary is underway to make a common boundary at 'lowest astronomical tide (LAT)' to clarify the jurisdiction of councils and assist in the management of significant coastal areas. Its use would allow consistent care, control and management of land-based activities, which is not fully possible under the variety of boundaries that currently exist.

The review of the *Crown Lands Act 1929* will be addressing management of coastal Crown lands. It is anticipated that the amendments to the Act will provide an option for vesting management of these lands to an appropriate body, such as local government.

**ACTION:**

Amend the *Crown Lands Act 1929* to provide for single ministerial responsibility for care control and management of Crown lands and improve administration and management of marine, coastal and river front Crown holdings.

The proposed NRM legislation will ensure strategic and integrated management of coastal lands.

**ACTION:**

Assist NRM Boards to address the protection of coastal and estuarine assets.

Sand dune (DEH).

## OBJECTIVE 5. TO IMPROVE UNDERSTANDING OF OUR COASTAL, ESTUARINE AND MARINE ENVIRONMENTS

Knowledge of our coastal, estuarine and marine habitats and species, ecosystems and the bio- and geo-physical systems and processes that exist in South Australia is incomplete.

The sustainable management of South Australian aquatic habitats and resources is critically dependent upon the continued development and application of our knowledge about the structure (biodiversity and distribution of biota) and function (ecological and evolutionary processes) of these ecosystems.

The sustainable use of these resources underpins the generation of wealth for regional, State and national communities and industries. Established industries include fisheries and aquaculture with potential for rapid development of new opportunities in ecotourism, minerals and exploration.

Fields of research include biodiversity assessment, aquatic ecology, fisheries science, aquaculture, and physical oceanography. The major nodes for this research are SARDI Aquatic Sciences, Flinders University of South Australia, University of Adelaide and the South Australian Museum. Additional capability is represented in DWLBC, DEH and PIRSA.

Understanding local impacts on coastal, estuarine and marine environments from the range of users, and particularly from pollutants and discharges to this environment, is necessary. This includes monitoring and information mapping of coastal and marine biological and physical environments.

### STRATEGIES

#### 5.1 Increase Knowledge to Inform Decision-Making

The Government is committed to increasing understanding of ecological processes and ecosystems in coastal, estuarine and marine environments to enable planning and decision-making to be supported by a sound information base. It is critical to identify management priorities and focus research activities to address these questions. Research must be coupled with longer term monitoring programs about the health of these environments.

Currently, the deployment of research and development capabilities is strongly influenced by cost-recovery arrangements with industry. There is a lack of resources to address fundamental questions in relation to the management of the broader coast and marine environment. Whereas South Australia has strong capabilities to support research to underpin the sustainable management of our wild fisheries resources, this is not matched in relation to the broader biodiversity and conservation challenges of marine and coastal environments. Aquaculture research, although strong in the State, is reliant on ad-hoc initiative funding, particularly through the Cooperative Research Centre for Sustainable Finfish Aquaculture (Aquafin CRC). There is a need for a long-term strategy to support the ongoing research and development needs of this rapidly developing industry sector.

#### **ACTION:**

Develop a mechanism to fund integrated research programs to support the broader management and planning agenda for the State's coastal, estuarine and marine environments.

A significant initiative of Government is to enhance the status of marine conservation in the State. Two concomitant programs led by DEH have been established to deliver marine conservation planning for State waters; the Marine Planning program and the Marine Protected Areas (MPAs) program. Marine planning operates at a regional scale and will deliver a framework for marine resource and environmental use. The MPAs program will establish a representative



Trevally (D Muirhead, Marine Life Society of SA).



Beach profile monitoring (A Eaton, DEH).

system of protected areas that incorporates significant representative areas of habitat types across each of the State's marine bioregions. The purpose of MPA is to conserve all forms of marine biodiversity throughout South Australia's unique and diverse estuarine and oceanic ecosystems. Successful delivery of the Government's marine conservation programs relies on access to best available ecological, geological and oceanographical information at scales appropriate to conservation planning rather than resource use management.

**ACTION:**

Develop a mechanism to build the State's marine conservation specific research programs and to fund programs that assess the current status and integrated function of South Australia's marine biodiversity.

The Government has recently launched the Marine Innovation SA (MISA) proposal in conjunction with Flinders University, the University of Adelaide and the South Australian Museum. MISA is an initiative to ensure the ecologically sustainable development of South Australia's fisheries, aquaculture and marine eco-tourism industries and to ensure the knowledge base to conserve and protect the natural resources, habitats and environments on which these industries rely. MISA will also establish South Australia as the focus for southern temperate marine research and development in Australia.

MISA aims to address key elements of the Government's agenda including:

- environmental management and protection through the expansion of current research initiatives in environmental assessment and sustainability analysis;
- the renewal and reinvigoration of regional communities (particularly coastal centres) through support for development of new marine-based industries;
- social inclusion through the development of education programs and new industries including opportunities for indigenous participation in fishing and aquaculture ventures; and
- economic development through new technologies to support value-adding and reducing the cost of production in the seafood industry.

**ACTION:**

Endorse the ongoing development of MISA as a whole of government strategy for focussing marine and aquatic research and development capability in the State towards the sustainable development and conservation of marine and aquatic resources and the environments on which they depend.

SARDI Aquatic Sciences re-established its Environment and Ecology Program in 2000-01. This program provides a broad-based environmental research and development capability for the State and undertakes a wide range of studies in collaboration with industry, the community and State and Commonwealth agencies. Research projects include studies to support the development of aquaculture management plans, assessing the regional impacts of aquaculture, analyses on the effects of port and channel clearance dredging, the management and eradication of *Caulerpa taxifolia* and more recently as a key partner in the Adelaide Coastal Waters Study.

This study will provide new knowledge and understanding of chemical, physical and biological processes to support management options. The study is focussing on seagrass loss, seafloor instability and water-quality degradation resulting from large-scale modification of the coast and discharges into eastern Gulf St Vincent. The study will also provide a program to assess the effectiveness of management actions (including monitoring program) and strategies to communicate results.

**ACTION:**

Develop the State's research and development capability in coastal, estuarine and marine environmental research through support for MISA and other programs.

DEH's Biodiversity Conservation Centre coordinates the systematic identification and description of plant species, and the review and listing of threatened plants and animals. This knowledge and information underpins decision making and the development of threatened species recovery planning and management across marine, estuarine and coastal environments.

**ACTION:**

Develop mechanisms to fund capacity building to adequately describe marine species and ecosystems, evaluate threatened status of marine species and coordinate threatened marine species recovery planning.

## 5.2 Monitor and Share Information

Monitoring programs and regular reporting are important components of effective information sharing. The results of such monitoring programs need to be published as annual environmental progress reports. Whereas this is currently done for both the fishing and aquaculture sectors (where fisheries assessment reports and environmental monitoring reports are published in the public domain) there is a need to incorporate a broader range of assessments including the effectiveness of MPAs and the impacts of major waste discharges into the marine environment.

Green Print SA is a high-level strategic document that illustrates major Government policy commitments. It will highlight key environmental issues for South Australia, Government initiatives that address those issues, and indicators to monitor performance annually.

**ACTION:**

Regularly review coastal, estuarine and marine aspects in the Government's high-level strategic Green Print SA, which illustrates major policy commitments.

The recent State of the Environment Report (SoE) was released in November 2003. The development of State of the Marine Environment indicators will form part of SoE Reporting, with monitoring of these indicators used to identify threatening processes. A comprehensive identification of threatening processes is necessary for management and remediation and a clear focus by government and industry.

It is important to develop and monitor performance indicators for the state of the marine environment. The indicators could be based upon water quality, fishing sustainability, invasive species, reef health and in areas where there is shore-based activity, and seagrass health at the least. It is also important to establish an ongoing monitoring program to monitor the state of marine health in South Australian waters.

Measurable indicators are being developed to effectively monitor ecological, social and economic changes in the marine environment based on bioregions. These are being developed over a ten-year period through the Standing Committee on Fisheries and Aquaculture (SCFA) and the FRDC Ecologically Sustainable Development reporting and assessment framework.

**ACTION:**

Identify indicators and assessment methodologies to enable effective monitoring and reporting of the ecological, social and economic changes in the coastal, estuarine and marine environment for SoE Reporting.

A commitment by the Government to establish a representative system of MPAs across the marine bioregions of the State incorporates explicit objectives to monitor and assess the performance of protected areas post-gazettal. Monitoring



### ADELAIDE REEF MONITORING

Work initiated by the EPA and undertaken by SARDI and the University of Adelaide has provided an assessment of the health of Adelaide's sub-tidal reefs. Overall the research indicated that the southern reefs are in good condition, while those to the north are in poor condition.

The survey is a valuable guide to identifying where human activity is having the greatest impact on the marine environment, as well as which reefs require the greatest protection. Since the completion of this research, there has been substantial additional commitment to reducing the impacts of water pollution on our metropolitan marine environment.

Reefwatch diver (G Adams, The Advertiser).

**CURRENT STATUS**

The online Atlas of South Australia ([www.atlas.sa.gov.au](http://www.atlas.sa.gov.au)) contains a wealth of information about South Australia's coastal environment. This spatial database has been sourced from a range of government agencies including DEH, PIRSA, DTUP and DWLBC and includes themes such as shoreline classifications, oblique aerial photographs, shipwreck locations, saltmarsh and mangroves, wetlands and aquatic reserves, biological survey sites, development planning zones and subdivisions, road access and many others. This online resource is an initiative of the South Australian government, building on Commonwealth government support through the Australian Coastal Atlas, and demonstrates how an integrated, collaborative effort can bring together the government's information resources in an accessible and interactive format.

DEH in partnership with SARDI Aquatic Sciences has invested \$200 000 for the first two years of a six-year program to investigate methods to restore seagrasses along the Adelaide metropolitan coast.

The Coast Protection Board, in conjunction with the EPA, has funded an investigation by SARDI Aquatic Sciences into the causes of seagrass loss at Beachport. This report identified that 80 per cent of the seagrass area has been lost over the last 20 years with only six hectares remaining.

SARDI has been working with various agencies to identify indicators for monitoring changes in the marine environment. For example, SARDI has worked with the EPA to identify indicators of environmental impacts from dredging and with Aquafin CRC to identify indicators for aquaculture impacts. In addition to this, PIRSA Aquaculture has identified environmental indicators for monitoring the impacts of aquaculture. A significant aquaculture research program is currently underway to refine existing indicators and identify new indicators of sustainable aquaculture development (a joint initiative with FRDC).

Transport SA has prepared codes of conduct for recreational and commercial users of marine assets with particular emphasis on the environmental issues. Transport SA has also published brochures aimed at raising community awareness and understanding of boating and safety and general information relevant to the

Continued over page

programs will be designed to detect change in floral and faunal biodiversity, abundance and biomass as surrogates for ecosystem health, and will compare condition within and outside of protected areas. Hence, the MPAs monitoring program will provide significant capacity to assess the impacts of resource use activities on marine systems, and the capacity of those systems to recover from extractive use.

**ACTION:**

Develop the State's research capacity to assess and monitor the performance of MPAs and the impacts of resource use on marine ecology.

The Government is currently working with non-government organisations, such as the Conservation Council of South Australia Inc, and the community to provide for the maintenance and development of 'Reef Watch' and other marine ecosystem monitoring programs. Reef Watch's 'Feral or in Peril' project is a good example of engaging the community in broad scale monitoring. Reef Watch provides divers with a free kit including underwater slates, identifying a number of potentially invasive species ('Ferals'), as well as a number of species of conservation concern (in 'Peril'), to encourage divers to register sightings of these species. The project provides early warning for invasive species, and information on potentially vulnerable species. This project will also provide assistance in the investigation and performance assessment of MPAs under SARSMPA. As part of developing MPAs, there is a need for accurate spatial knowledge of benthic habitat distribution within locations identified as focus areas for MPA development.

**ACTION:**

Engage non-government organisations and the broader community on Reef Watch, 'Feral or in Peril' and other marine ecosystem monitoring programs in South Australian waters.

The development of an integrated system for the collection and storage of all marine data collected from various agencies and organisations, including publicly funded research, should be undertaken to develop systems for management and access. This will allow sharing of research data and inventories on ecological systems, taxonomy, systematics and biodiversity for better decisions on resource conservation and use.

**ACTION:**

Investigate the development of an integrated system for the collection, storage, analysis and synthesis of all coastal, estuarine and marine data collected by agencies and organisations, including publicly funded research, and develop systems for management and access.

**5.3 Raise Community Awareness and Education**

Community understanding and support is crucial to the success of the Living Coast Strategy. Education is a fundamental component in achieving this outcome.

The contribution of effective teaching material to the primary, secondary and tertiary education sectors assists in the development of an understanding of the importance of the marine environment as a life support system and the implications of unsustainable resource users. It also assists in developing an understanding of the coastal environment and the pressures that threaten its future health.

### Coast and Marine Education Framework

Recently, the Government launched the Coast and Marine Education Framework, a teacher and student education resource. The Framework, developed in collaboration with an advisory group of approximately 30 coast and marine educators, is designed and constructed to fit the requirements of the South Australian Curriculum Standards and Accountability Framework, by which all schools in the State operate. This resource will assist educators in identifying what resources, activities and contacts are available to them that satisfy the school curriculum requirements.

The Framework introduces an understanding of the ecological systems and addresses the human impacts on coastal and marine environments. It also identifies appropriate behaviour for protecting and maintaining the qualities of coastal and marine environments with sustainable practices that students can apply themselves. It guides educators and students to the best local, national and international coastal and marine resources on the web and relates them to particular sustainability outcomes.

The recently launched Coast and Marine Education Framework develops and encourages responsibility and effective stewardship of coastal, estuarine and marine environments. A community that is better informed will be developed from early input by the education system, teaching students about the natural values of coastal, estuarine and marine environments and opportunities for conservation and resource management.

#### **ACTION:**

Support the Coast and Marine Education Framework to encourage community responsibility and stewardship of the marine environment through education.

An explicit objective of the marine conservation programs of DEH is the delivery of enhanced community awareness and education regarding the importance of conservation and the delivery of the principles of ESD within the marine environment. Delivery of the programs will involve the inclusion of community groups in MPA monitoring and the dissemination and interpretation of information about the marine ecology of South Australia.

#### **ACTION:**

Develop the State's marine education capability in coastal, estuarine and marine conservation through support for interpretive programs.

MISA will link State agencies (SARDI and the South Australian Museum) with the tertiary sector and thereby support the development of advanced research and industry based training programs. This will enhance the position of South Australia and support efforts by the Universities to attract students at a national and international level. Direct linkages between research and development projects, addressing State issues, with the teaching programs at South Australian Universities will also broaden community knowledge and understanding to the benefit of the environment and the industries it sustains.

There is a need to develop individual Users' Codes of Conduct to guide people taking part in tourism, fishing and outdoor activities such as boating and jet skiing to adopt environmentally friendly and safety conscious behaviour in coastal reserves and in all State waters, and to promote sensitive and responsible use of coastal, estuarine and marine environments by all users.

### CURRENT STATUS CONT'D

boating public. Titles include: South Australian Recreational Boating Safety Handbook, Protecting Our Waters, 2002 Tide Tables for South Australian Ports, Protecting Our Coastal Waters – Doing it Better – A Code of Practice for Commercial Users of Transport SA Marine Facilities and Marine Operations.

PIRSA Fisheries has put in place codes of conduct for both commercial and recreational fishers. The Fish Habitat Handbook provides guidelines for assessing and minimising the impacts of land-based developments on the marine environment.

PIRSA Fisheries also maintains a website where current information relating to recreational fishing regulations can be accessed. The web site address is [www.pir.sa.gov.au/fishing](http://www.pir.sa.gov.au/fishing).

PIRSA Fishwatch has in place a number of strategies aimed at maximising voluntary compliance with fisheries legislation. These include a Recreational Fishing Guide, Fishwatch telephone service, Sign Posting Program and a Get Hooked It's Fun to Fish School Kit aimed at promoting a responsible fishing message.

The Fishwatch telephone service is a 24-hour free call service to provide fishers with telephone access to information about recreational fishing rules and enables members of the public to report any suspected illegal fishing activity.

PIRSA Fishwatch has installed on public jetties and wharves around the State approximately 120 fish measuring stations that enable fishers to measure their fish and at the same time check the legal size limit. PIRSA Fishwatch has also installed approximately 270 recreational fishing signs providing information about the size, bag and boat limits that apply in South Australia and signs marking Aquatic Reserves and other specific fishing closures across the State.

A Diving with Dragons Code of Conduct has been developed by the Threatened Species Network, the Marine and Coastal Community Network, DEH and PIRSA with support from other groups.

It is anticipated that an updated State-wide dive brochure, providing for the protection of the cultural and natural heritage of the marine environment, will be released in the near future. State-wide codes of conduct are being

Continued over page



### CURRENT STATUS CONT'D

developed for diving with some of South Australia's marine bio-icons such as sea lions and cuttlefish. These codes will be similar to the code of conduct for diving with sea dragons.

DEH has produced a number of brochures and newsletters aimed at informing the community on initiatives. Recent brochures include: the Marine Planning Framework and Spencer Gulf Marine Plan, Marine Protected Areas, the Adelaide Dolphin Sanctuary, Leafy Seadragon Education Kit for Primary Schools (developed in conjunction with the Marine Discovery Centre, Star of the Sea School), and Seagrasses of South Australia. The DEH Internet site [www.environment.sa.gov.au/ecp](http://www.environment.sa.gov.au/ecp) also contains information on a range of coastal and marine issues and initiatives.

DEH has also recently released brochures on CASS and garden weeds. These are in addition to a range of brochures on monitoring beach sands. DEH also has a display caravan that promotes beach and marine programs and is used at various beachside functions.

The community is also educated through organisations around the State that provide educational material for schools. These materials include resources, activities, kits, fact sheets, project officer expertise and time, outdoor education, and education centres. Some of the organisations are the Marine and Coastal Community Network, Marine Life Society of South Australia, Marine Education Society of Australasia, Reef Watch, Water Watch, and the Marine Discovery Centres at the Star of the Sea School, Hallett Cove School, and Port Vincent Primary School.

Pasminco, Port Pirie (DEH).

### ACTION:

Develop individual Users' Codes of Conduct to encourage tourists and other recreational users to adopt environmentally friendly and safety conscious behaviour in all State waters and to promote sensitive and responsible use of coastal, estuarine and marine environments.

The EPA is currently developing a Waterwatch SA Estuarine Monitoring Program Framework and Guidance Manual for the community.

Planning SA has released a package of draft documents on urban stormwater prepared in conjunction with the Patawalonga and Torrens CWMBs. These documents provide information for improved stormwater planning for the councils within the Patawalonga and Torrens catchments.

The EPA is progressing a number of initiatives to reduce stormwater pollution. It is revamping its Stormwater Pollution Prevention Codes of Practice into a consolidated Stormwater Code with associate guidelines for specific industries. Work continues with the building and construction industry as the focus industry in the first instance.

### ACTION:

Revamp the EPA's Stormwater Pollution Prevention Codes of Practice into a consolidated Stormwater Code with associate guidelines for specific industries as initiatives to reduce stormwater pollution.

## OBJECTIVE 6. TO DEVELOP AND MAINTAIN PARTNERSHIPS BETWEEN STATE AND LOCAL GOVERNMENTS, COMMUNITY AND INDUSTRY

The community and local government are important stakeholders in the protection and management of coastal, estuarine and marine environments. Local government is a key player in coastal management in South Australia. Incentive and investment mechanisms encourage community and industry environmental stewardship.

### STRATEGIES

#### 6.1 Establish Management Responsibilities Between State and Local Government

The significance of allocating management responsibilities equitably between local and State governments is recognised. These responsibilities include coast protection, land management, stormwater management and maintenance of coastal biodiversity as well as identifying cost-sharing arrangements. It is proposed that management and funding responsibilities will be reviewed during the development of the proposed Coast and Marine Act.

The LGA has recently released a report summarising local government's involvement in coastal management and proposing management structures across local government that will facilitate its involvement in negotiations with State Government.

#### **ACTION:**

Review management and funding responsibilities for coastal management during the development of the new Coast and Marine Act.

#### 6.2 Maintain Partnerships and Joint Responsibility

Partnerships need to be developed with all stakeholders including the Commonwealth, State and local governments, industry, Aboriginal communities and the community at large, to ensure effective coordination of management actions. In regard to coastal, estuarine and marine initiatives, partnerships already exist between State Government, local government and other organisations in South Australia such as CSIRO, CWMBs, NRM Boards, peak industry, conservation and recreation bodies.

The *Wetlands Strategy for South Australia* provides a framework for coordinated and integrated management of coastal wetlands, including estuaries. This strategy identifies partnerships between Commonwealth, State, and local governments, community groups, landowners, industry, research organisations, regional NRM groups and CWMBs for wetland management, research, education and conservation, including coastal wetlands. Fifty-seven actions are documented with partnerships and coordinating responsibilities clearly identified.

Regional groupings of local government have taken the initiative to develop the Great Australian Bight 1000 West Coast Strategy, South East Coastal Management Strategy and Southern Fleurieu Coastal Action Plan, which guide development and use of these regions.

The Local Government Coastal and Marine Focus Group includes representation from metropolitan and rural coastal councils and the LGA. The primary role of this Group is to present local government's position on coastal, estuarine and marine policies and issues, and provide for integrated coastal, estuarine and marine management in regard to local government.



Towing tuna cages (A Eaton, CPB).



## CURRENT STATUS

The Government is committed to a partnership with fishers to manage fisheries and habitat condition. The aim is to have ecologically sustainable and profitable fisheries and aquaculture enterprises being professionally managed, including input from all interested groups.

A management strategy for the sustainable development of recreational fishing in South Australia sets out a five-year framework for maintaining and building upon the significant values and benefits of recreational fishing in South Australia. This strategy was prepared by the Recreational Fishing Industry Review Committee, comprising recreational fishing representatives and facilitated by PIRSA Fisheries. The strategy is based on principles acknowledging the importance of community involvement, partnerships and shared responsibilities in the ecologically sustainable development of recreational fisheries. One of the six strategic goals is 'Community Ownership' and the promotion and involvement of recreational fishers in the management of South Australia's fisheries.

PIRSA coordinates Fishcare Volunteers who distribute information about fishing rules to recreational fishers. They conduct organised patrols at jetties, boat ramps and other places where recreational fishers are found. They also attend major events such as the Boat Show and Field Days. Last year, the 90 volunteers contributed 8200 volunteer hours and spoke to nearly 15 500 people.

Jetty fishing at Kingscote (PIRSA – Fishwatch).

The LGA has recently released a report on coastal management recommending replacement of the Local Government Coastal and Marine Focus Group by a new regional committee under the LGA. The Metropolitan Councils Committee will also be maintained.

Some South Australian coastal councils, including but not limited to the cities of Port Adelaide-Enfield, Onkaparinga, Holdfast Bay, Marion and Whyalla, have prepared local non-statutory coastal management plans to guide management of the coastal areas in their jurisdictions and typically contain policy, strategy and project delivery elements. These plans provide important locally derived policies and strategies that can inform regional and State planning processes.

### **ACTION:**

Once agreement is reached on allocation of responsibilities, support South Australian coastal councils in exercising their responsibilities through council's or regions of council's developing regional and local coastal strategies to guide management of the coastal areas in their jurisdictions.

## 6.3 Promote Support and Ownership Across the Community

As a result of the initiatives of a number of agencies, the community and industry have become more involved in decision-making processes, including the development of the Adelaide Dolphin Sanctuary, the Spencer Gulf Marine Plan and the MPA program, where the community and industry have been involved in decision-making through the MPA Task Force and have had input into the Vision Document. The Regional Consultative Committees for Marine Protected Areas will also involve the community and industry in decision-making in the future. The development and management of the Great Australian Bight Marine Park also involved, and continues to have significant input from, the community. Many other community initiatives such as Coastcare, Reef Watch, Water Watch and Fishwatch continue to be successful.

There is a need to maintain existing and provide additional opportunities for encouraging greater community and industry involvement in decision-making on local coastal, estuarine and marine issues, leading to a greater sense of responsibility, understanding and 'ownership' of decisions. This promotes positive interactions between the community, industry and government about coastal, estuarine and marine environments.

### **ACTION:**

Provide opportunities for encouraging community and industry involvement in decision-making on local environment issues to encourage a greater sense of responsibility, understanding and 'ownership' of coastal, estuarine marine environment decisions.

Coordination of community projects along the coast will take place through the Regional NRM Boards, which will manage this work through coastal, estuarine and marine coordinators and facilitators. It is important to ensure that the new arrangements are as effective at delivering on ground outcomes.

Community monitoring initiatives such as Water Watch are providing information and educating the community.

### **ACTION:**

Maintain partnerships with coastal, estuarine and marine environment users such as Reef Watch, Water Watch and Fishwatch.

## IMPLEMENTATION

The *Living Coast Strategy* encompasses a range of environmental initiatives and programs and sets out the policy directions that the State Government will be taking over the next five years to help protect and manage South Australia's coastal areas, estuaries and marine ecosystems for their conservation and sustainable use.

Whilst the Strategy provides leadership and facilitates coordination of actions across the State, implementation will be achieved through the responsibilities of agencies, guided by existing statutory mechanisms. To be successfully implemented, the *Living Coast Strategy* will need the commitment of lead agencies, partners and stakeholders with responsibilities in the coast, estuarine and marine environment and the effective and efficient use of available funds.

The Strategy provides clear policy directions for actions in the coast, estuarine and marine environment and for improvement of existing programs for which resources are already allocated. Funding for new initiatives will continue to be established through annual budget processes by responsible agencies.

Progress reports indicating progress in implementing actions in the Strategy will be prepared. Green Print SA and SoE will be additional reporting mechanisms for the *Living Coast Strategy*.



Child on beach (DEH).



Flinders University archaeology students, the Society for Underwater Research and DEH excavating and stabilising the Fishery Bay Tryworks at Port Lincoln (T. Arnott, DEH).

## ABBREVIATIONS

ALW	Astronomical Low Water
ANZECC (1999)	Australia and New Zealand Environment Conservation Council
ASR	Aquifer Storage and Recovery
CASS	Coastal acid sulphate soils
CPB	Coast Protection Board
CRC	Cooperative Research Centre
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CWMBs	Catchment Water Management Boards
DAARE	Department of Aboriginal Affairs and Reconciliation
DEH	Department for Environment and Heritage
DWLBC	Department of Water, Land and Biodiversity Conservation
EIPs	Environment Improvement Programs
EPA	Environment Protection Authority
ESD	Ecologically Sustainable Development
FMCs	Fisheries Management Committees
FRDC	Fisheries Research and Development Corporation
ICZM	Integrated Coastal Zone Management
IPAP	Improved Policies and Procedures program
IUCN	International Union for the Conservation of Nature (now WCU)
LAT	Lowest astronomic tide
LGA	Local Government Association
MARPOL Convention	International Convention for the Prevention of Pollution from Ships
MISA	Marine Innovation South Australia
MPA	Marine Protected Area
NRSMPA	National Representative System of Marine Protected Areas
NHT2	National Heritage Trust – Stage 2
NRM	Natural Resource Management
NRMBs	Natural Resource Management Boards
PAR	Plan Amendment Report
PIRSA	Primary Industries and Resources South Australia
RAC	Resource Assessment Commission
SARDI	South Australian Research and Development Institute
SARSMPA	South Australian Representative System of Marine Protected Areas
SATC	South Australian Tourism Commission
SoE	State of the Environment Report
STP	Sustainable Tourism Package
WCU	World Conservation Union
WWTPs	Waste Water Treatment Plants

## GLOSSARY

accretion	any gradual increase in size through growth or external addition
algal blooms	a sudden proliferation of microscopic algae in water bodies, stimulated by the input of nutrients such as phosphates
aquaculture	commercial growing of marine or freshwater animals and plants in water
ballast water	water carried in tanks to maintain stability when a ship is lightly loaded; normally discharged to the sea when the ship is loaded with cargo
benthic	plant and animal life associated with the aquatic floor and the sea bed
biodiversity	variability among living organisms from all sources (including terrestrial, marine and other ecosystems and ecological complexes of which they are part) and includes: diversity within species and between species and diversity of ecosystems
bioregion	a territory defined by a combination of biological, social and geographical criteria rather than by geopolitical considerations; generally, a system of related interconnected ecosystems
biota	all of the organisms at a particular locality
bycatch	the catch of species other than those targeted by fishing activity
catchment	the area determined by topographic features within which rainfall will contribute to runoff at a particular point under consideration
conservation	In relation to biodiversity: the protection, maintenance, management, sustainable use, restoration and enhancement of the natural environment. In relation to natural and cultural heritage: conservation implies keeping in safety or preserving the existing state of a heritage resource from destruction or change
diffuse pollution	pollution from a source, which is not easily identified at a particular place
ecosystem	a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit
endemism	native to a particular geographic region
epiphytic	a plant which grows upon another but does not obtain food, water or minerals from it
eutrophication	a process by which waters become enriched with nutrients, primarily nitrogen and phosphorus which stimulate the growth of aquatic flora and/or fauna
Greenhouse effect	a term used to describe the role of atmospheric trace gases – water vapour, carbon dioxide, methane, nitrous oxide, ozone, in keeping the earth's surface warmer than it would be otherwise
groundwater	water beneath the surface



Beach fisher (P Canty).



Oyster farm.

heavy metal	metallic element with relatively high atomic mass such as lead, cadmium, arsenic and mercury; generally toxic in relatively low concentrations to plant and animal life
intertidal	between the levels of low and high tide
invasive species	a species occurring as a result of human activities beyond its accepted normal distribution and which threatens valued environmental, agricultural or personal resources by the damage it causes
mangrove	a plant (belonging to any of a wide range of species, mainly trees and shrubs) that grows in sediment regularly inundated by sea water
point-source pollution	pollution from an easily discernible, single source such as a factory or a sewage treatment works
prograde	build up of sand resulting in the coastline moving seaward - accreting seaward
Ramsar Convention	the Convention on Wetlands, signed in Ramsar, Iran, in 1971 providing the framework for the conservation and wise use of wetlands and their resources
salinity	the concentration of salts in water and/or soil
seagrass	intertidal and subtidal flowering plants found mainly in shallow waters of protected coastal areas
sustainable	an activity able to be carried out without damaging the long-term health and integrity of natural and cultural environments
taxon, taxa	scientifically recognised species, subspecies, variety or forms of organisms
threatened	a species or community that is vulnerable, endangered or presumed extinct
threatening process	a process that threatens, or may threaten, the survival, abundance or evolutionary development of a native species or ecological community
turbidity	the extent to which the passage of light through water is reduced by suspended matter
wastewater	used water; in most cases not suitable for drinking
wetland	areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which does not exceed six metres (IUCN 1971)

## APPENDIX 1

### ECOLOGICALLY SUSTAINABLE DEVELOPMENT

Ecologically Sustainable Development (ESD) means using, conserving and enhancing the environment in a way, and at a rate that will enable people and communities to provide for their economic, social and physical well-being while:

- (a) sustaining the potential of natural and physical resources to meet the reasonably foreseeable needs of present and future generations;
- (b) safeguarding the life-supporting capacity of air, water, land and ecosystems; and
- (c) avoiding, remedying or mitigating any adverse effects of activities on the environment.

Ecologically Sustainable Development can be achieved by giving consideration to the following:

- (a) the integration principle – proper weight should be given to both long and short-term economic, environmental, social and equity considerations in decision-making processes;
- (b) the precautionary principle – if there are threats of serious or environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;
- (c) in the application of the precautionary principle, public and private decisions should be guided by careful evaluation to avoid serious or irreversible damage to the environment wherever practicable and by an assessment of the risk-weighted consequences of various options;
- (d) inter-generational equity – the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations;
- (e) conservation of biological diversity and ecological integrity – conservation of biological diversity and ecological integrity should be a fundamental consideration;
- (f) improved valuation, pricing and incentive mechanisms – environmental factors should be included in the valuation of assets and services. Environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems;
- (g) public participation – public involvement in decision-making should be encouraged, including accessing reliable and relevant information to facilitate good public understanding of issues; and
- (h) shared responsibility – achieving ESD is a responsibility shared by all levels of government and industry, business, communities, and the people of South Australia.

## APPENDIX 2

### INTERNATIONAL TREATY OBLIGATIONS

International treaties and their associated obligations influence how the Commonwealth and States exercise their responsibilities in management of Australia's marine and ocean resources. Principal international treaties to which the Commonwealth is party include:

#### Conventions

- International Convention on Regulation of Whaling 1946
- Convention in the Continental Shelf 1958
- Convention on Wetlands of International Importance especially for Waterfowl (Ramsar) 1971
- International Convention on Prevention of Marine Pollution by Dumping of Wastes 1972 (London Protocol)
- Convention for Conservation of Antarctic Seals 1972
- Convention for Protection of World Cultural and Natural Heritage 1972
- International Convention for Prevention of Marine Pollution from Ships (MARPOL) 1973
- Convention on International Trade in Endangered Species of Wild Flora and Fauna 1973
- International Convention for Safety of Life at Sea 1974
- United Nations Convention on the Law of the Sea 1982
- Climate Change Convention 1992
- Convention on Biological Diversity 1992
- Convention on Conservation of Southern Bluefin Tuna 1993
- Convention on Migratory Species
- United Nations Framework Convention on Climate Change

#### Agreements

- Agreement on the Conservation of Albatrosses and Petrels
- Agreement between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment (CAMBA)
- Agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds in Danger of Extinction and their Environment (JAMBA)
- Australia – Asia Shore birds agreement

### NATIONAL OBLIGATIONS

#### Policies

- National Strategy for the Conservation of Australia's Biological Diversity
- National Native Vegetation Framework
- Wetlands Policy of the Commonwealth Government of Australia
- Australia's Oceans Policy
- National Greenhouse Strategy
- National Strategy for Ecologically Sustainable Development
- A Framework for a National Cooperative Approach to Integrated Coastal Zone Management

### COMMONWEALTH LEGISLATION

- *Environment Protection and Biodiversity Conservation Act 1999*
- *Environment Protection and Biodiversity Conservation Amendment (Wildlife Protection) Act 2001*
- *Environment Protection (Sea Dumping) Act 1981*
- *Native Title Act 1993*
- *Petroleum (Submerged Lands) Act 1967*
- *Wildlife Protection (Regulations of Exports and Imports) Act 1982*

## SOUTH AUSTRALIAN COAST AND MARINE LEGISLATION

- Aboriginal Heritage Act 1988
- Animal and Plant Control Act 1986
- Aquaculture Act 2001
- Coast Protection Act 1972
- Crown Lands Act 1929
- Development Act 1993
- Environment Protection Act 1993
- Fisheries Act 1982
- Harbors and Navigation Act 1993
- Heritage Act 1993
- Historic Shipwrecks Act 1981
- Local Government Act 1999
- Mining Act 1971
- National Parks and Wildlife Act 1972
- Native Title (South Australia Act) 1994
- Native Vegetation Act 1991
- Offshore Minerals Act 2000
- Petroleum Act 2000
- Petroleum (Submerged Lands) Act 1982
- Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987
- SA Water Corporation Act 1994
- Water Conservation Act 1936
- Water Resources Act 1997

## APPENDIX 3

### A NATIONAL COOPERATIVE APPROACH TO INTEGRATED COASTAL ZONE MANAGEMENT

In October 2003, the Commonwealth, States and Territories - through the National Resource Management Ministerial Council - endorsed A Framework for a National Cooperative Approach to Integrated Coastal Zone Management. The Integrated Coastal Zone Management (ICZM) framework highlights all Australian governments' commitment to a national approach to coastal issues. This approach builds on efforts to implement the 1993 Resource Assessment Commission's (RAC) Coastal Zone Inquiry report recommendations to achieve long-term ecologically sustainable development of the coastal zone for present and future generations.

The ICZM framework sets the scene for national cooperation in managing coastal issues and achieving ecologically sustainable development outcomes in the coastal zone over the next decade. Whilst it is recognised that jurisdictions have different legislative and administrative frameworks for managing the coastal zone, adopting a national cooperative approach will address cross-border and sectoral issues; harmonise joint action towards management of common issues; and build on existing and encouraging potential new investments from all jurisdictions.

It is considered of national importance to Australia's future to achieve conservation of coastal biodiversity, improvement of coastal water quality and protection of the economic base of coastal areas. The major outcomes to be achieved through the framework at the national, state, regional and local levels are:

- managing coastal issues that are of national scale and scope; and
- managing coastal issues where complementary arrangements will work better.

#### **Issues of a National Scale and Scope**

Issues of national scale and scope require national efforts to maximise returns to the nation as a whole. These coastal issues include cross border issues such as the impacts of climate change and sea level rise; addressing major pressure points (such as land based sources of marine pollution and managing introduced pests); enhancing Australia's competitiveness to maximise its 'clean and green' reputation; and promoting and enhancing sustainable resource use.

In managing issues of national scale and scope, the Framework will deliver:

- a proactive and adaptive approach to address coastal issues of a national scale that are beyond the scope of individual jurisdictions;
- over a 10 year timeframe, guidance for investment in the ecologically sustainable development of the coastal zone through greater clarity and certainty of government's directions;
- performance information to track progress in achieving integrated coastal zone management outcomes; and
- a commitment to improved capacity to undertake integrated coastal zone planning and decision-making.

#### **Coastal Issues where Complementary Arrangements Will Work Better**

More than a decade ago the RAC Inquiry Report concluded that there were major resource management problems in the coastal zone. The Report's conclusions and recommendations sought to improve the effectiveness of coastal management arrangements so that Australians could obtain greater benefit from the use of coastal zone resources, protect coastal environments and provide the catalyst for numerous improvements and reforms in coastal management. Australia's States and Northern Territory have developed and continue to improve legislative, policy and program responses to meet the management challenges associated with increasing pressures in the coastal zone. The *Living Coast Strategy* is one such policy initiative.

It is recognised that there are specific coastal issues that would benefit further from

complementary arrangements between jurisdictions under a national approach. The Framework provides a mechanism to encourage complementary arrangements to build on the successes and the momentum established through current State and Territory coastal management initiatives.

Delivery of outcomes will be achieved through:

- adopting approaches to maximise opportunities for achieving comparable national standards and consistent outcomes, for example in relation to national capacity building and mechanisms that encourage particular forms of resource use and collaborative behaviour among institutions and user groups;
- more efficient and effective delivery of ecologically sustainable development outcomes in the coastal zone through integrating natural resource management marine and coastal outcomes as part of the regional delivery of the Natural Heritage Trust;
- efficient and effective delivery of integrated coastal zone management for issues of national scale, such as through agreement to measures for the prevention and management of introduced marine pests, terrestrial plant and animal pests;
- sharing information, knowledge and resources to provide opportunities for best practice coastal management of efforts directed to landscape restoration and rehabilitation, streamlined research, reporting and database development;
- coordination of effort in waste water management and combating land based sources of marine pollution at a national scale;
- effective allocation of resources, such as through encouraging consistent governance arrangements where it is important to provide a level playing field for industry to achieve ecologically sustainable development;
- avoiding overlap and duplicated effort on nationally significant issues, such as coastal acid sulfate soils; and
- cooperation on significant national initiatives such as the Coastal Catchments Initiative and Sustainable Cities Initiative.

### Coastal Issues of National Importance

A range of human induced activities threaten many coastal environments, particularly estuarine systems, as a result of intensified use of and demand for coastal resources. Current trends in coastal demography and economic activities are expected to continue, with particular emphasis on:

- population and demographic shifts combined with growth;
- growth and changes in the nature of tourism and visitation patterns;
- an affluent, mobile and aging population;
- changes from traditional, often rural, uses of the coast to higher value uses such as service industries and increasing urbanisation; and
- potential population increases in small to medium coastal towns that is not matched by development of an equivalent sustainable industry economic base.

Key impacts include:

- introduced pest plants and animals in coastal environments and areas of primary productivity, such as fisheries, aquaculture, and agriculture;
- loss of coastal habitats and biodiversity, which in turn impact on the ongoing viability of coastal zone use and productivity in areas such as fisheries, tourism and recreation;
- increasing residential development and urban sprawl on coastal habitats;
- coastal acid sulfate soil impacts on water quality and agricultural productivity;
- non-point source urban and catchment pollution, such as sediment and nutrient runoff; and
- marine pollution from vessel sources such as sewage, oil and marine debris.

All jurisdictions are taking measures to manage these threats. However, a cooperative approach will enhance management outcomes by better utilising existing national frameworks and strategies by facilitating the sharing of information and identification of investment priorities to address them, by minimising cross border impacts and by fostering competitive advantage in a whole of sector approach to environmental stewardship and responsibility.

Coastal issues of national importance addressed by the ICZM framework include:

- land and marine based sources of pollution;
- Climate Change – opportunities and threats;
- introduced pest plants and animals;
- allocation of coastal resource use; and
- capacity building.

### **1. Land and Marine Based Sources of Pollution**

#### *Land Based Sources of Pollution*

Land based sources of pollution, especially diffuse sourced pollution, whether derived from agricultural or urban sources, has been identified as one of the greatest threats to the health, productivity and biodiversity of Australia's coasts and oceans. The effects of land-based sources of pollution tend to be reasonably well understood where those effects are obvious and extreme. However, these effects tend to be very poorly understood where they are small, non-linear and or spatially exclusive. National measures and programs to improve estuarine, coastal and marine water quality will improve ecologically sustainable outcomes.

#### *Marine Pollution*

Legal frameworks are currently in place in Australia to implement the MARPOL convention on marine pollution. All coastal States and Territories have incorporated MARPOL requirements into their legislation, but enforcement can be difficult and expensive. There is a great deal of marine debris arriving on Australian shores from unregulated dumping of waste in international waters. Containment of waste including biological debris and paint spills from harbours is also an issue.

### **2. Climate Change – Opportunities and Threats**

Significant climate change has the potential for major impacts on Australia's environment, property and economy. Changes in temperature, precipitation, sea level, wind and climatic patterns, fire regimes and the spread of diseases may all be associated with climate change. Wetlands, estuaries, coral reefs, beaches and dune systems and other sensitive coastal ecosystems are particularly vulnerable to the impacts of climate change. Increased coastal hazards are expected from resulting changes in coastal processes. These will affect infrastructure of the coastal zone and the economic base of coastal communities. Climate change will also have major implications for fisheries and other coastal dependent industries.

The complexity and expense of predictive models required to assist adaptation to climate change highlight the need for a cooperative effort across jurisdictions for their development and operation. Coastal ecosystems span jurisdictional boundaries so potential changes to them are likely to affect more than one jurisdiction. There are no consistent guidelines on how to apply climate change scenarios. Adequate forward planning, that builds on existing national and State processes, such as the National Greenhouse Framework, is required to meet the challenges that may arise from climate changes and is an opportunity that would benefit significantly from a national cooperative approach.

### **3. Introduced Pest Plants and Animals**

The introduction of weeds and pest species has contributed to national reductions in biodiversity and marine, estuarine and coastal productivity. On a national scale non-native plant species now account for about 15 per cent of our total flora and the populations are expanding. About half of them invade native vegetation, the likely effect of which are changes in the structure, species composition, fire frequency and abundance of native communities. The exotic plant species of greatest concern to the coastal environment is Bitou Bush. Environmental weeds are spread by birds, animals and people. An emerging concern is the threat from the spread of pathogens and viruses, which are transported by people, their cargo, fishing gear, boats and parcels which are difficult to detect. Introduced marine pests enter Australia through ships' ballast water, as biofouling on ships' hulls and equipment, and through deliberate introduction (from the aquarium trade and aquaculture for example). Around 97 per cent of the volume of Australia's trade is moved through coastal ports. With around 6000 ship visits per year, further introductions of marine pests in coastal waters also represent a significant

economic and environmental threat. Translocation of introduced marine pests within Australian waters occurs through the same means, as well as by means of natural processes. There are now up to 400 introduced marine species in Australia. One in six is, or will become, a pest.

#### **4. Allocation of Coastal Resource Use**

Managing impacts of change in coastal land use poses significant long-term challenges to ensure coastal resources are allocated efficiently and effectively in line with the principles of ecologically sustainable development.

Key issues to consider in responding to these challenges include:

- developing an understanding of future trends and implications nationally, regionally and locally;
- ensuring that appropriate valuation is made of the ecosystems services that are provided to support the coastal zone;
- developing effective mechanisms to reduce uncertainty for investment and economic development;
- considering attractive investment incentives to encourage economic development; and
- encouraging environmental stewardship by industry and community.

Managing changes both in terms of distribution patterns and rate of change will require a range of tools both regulatory and non-regulatory as well as an enhanced institutional capacity to achieve a balance between environmental, social and economic objectives for the coastal zone.

The Council of Australian Governments and the Natural Resource Management Ministerial Council have agreed national agendas for water reform, vegetation management and response to greenhouse, which will guide all jurisdictions in the process of reform for improved water allocation and native vegetation management. These processes will impact on the coastal zone to some extent but they will not necessarily address all aspects of resource allocation and use.

#### **5. Capacity Building**

Capacity building of stakeholders is critical to achieve effective coastal management and protection of coastal resources. It is a long-term investment in order to achieve effective and sustained coastal zone outcomes. Improved and informed decision-making and implementation of decisions in the coastal zone must be under-pinned by the necessary skills, tools, technical knowledge and science.

All managers, users and volunteers, including local government and Indigenous coastal managers and communities, need to be well equipped to meet their responsibilities through:

- capacity building initiatives that support informed decision making;
- effective allocation of resources;
- adequate investment in research and information sharing to support effective decision making and management; and
- provision of support to, and recognition of, the contribution of community based volunteer action.

A national cooperative approach to capacity building will enhance existing national, State and local initiatives and ensure effective integration of coastal and marine requirements in the natural resource management and other related management capacity building frameworks.

To achieve the ICZM framework outcomes a number of high-level actions have been developed. A detailed implementation plan is to be prepared to ensure the key actions identified under the themes are implemented and that outcomes sought from those actions are achieved within nominated time frames. These actions will build on existing coastal management initiatives at the Commonwealth, State and local levels.

## APPENDIX 4

## RESPONSIBILITY FOR ACTIONS

ACTIONS	LEAD AGENCY
<b>OBJECTIVE 1. TO PROVIDE A LEGISLATIVE AND POLICY FRAMEWORK FOR ECOLOGICALLY SUSTAINABLE DEVELOPMENT AND USE OF OUR COASTAL, ESTUARINE AND MARINE ENVIRONMENTS</b>	
<b>1.1 Develop and Implement New Coast and Marine Legislation</b> Develop Coast and Marine legislation, which establishes a Coast and Marine Authority to assist with the integrated, multiple-use management of the coast and marine environment by providing specialist management, understanding and knowledge.	DEH
<b>1.2 Develop a Marine Planning Framework</b> Use the Marine Planning Framework to strengthen and integrate coastal and marine planning for sustainable use of marine resources and related activities.  In consultation with stakeholders, develop statutory Marine Plans, covering the marine bioregions of South Australia, that establish zones based on particular environmental values and set out objectives and strategies to ensure activities within each zone are compatible with those values.	ALL
<b>1.3 Ensure Linkages with the Planning Strategy for South Australia and Proposed State Natural Resource Management Plan</b> Incorporate marine objectives from Marine Plans into the Planning Strategy for South Australia and proposed State NRM Plan thereby reinforcing the role of these documents in the coastal and marine zone.	PLANNING SA / DEH / DWLBC
<b>1.4 Develop an Estuaries Policy</b> Develop an Estuaries Policy that identifies issues, objectives and principles and recommends actions for the management and conservation of estuaries in South Australia.	DEH / DWLBC
<b>1.5 Facilitate Integration of Coast, Estuarine and Marine Resource Management Legislation</b> Ensure planning or actions that occur under marine resource management legislation have regard to Marine Plans.	ALL
<b>1.6 Maintain Effective Inter-Governmental Relations</b> Promote inter-governmental relations to underpin the <i>Living Coast Strategy</i> and support integrated planning and management.	ALL
<b>OBJECTIVE 2. TO CONSERVE AND SAFEGUARD THE NATURAL AND CULTURAL HERITAGE OF OUR COASTAL, ESTUARINE AND MARINE ENVIRONMENTS</b>	
<b>2.1 Establish Effective Conservation Strategies</b> Assess the conservation significance of coastal, estuarine and marine habitats and the status of the management arrangements for these habitats.  Improve the process for the regular review and assessment of the ecological status of coastal, estuarine and marine environments through the Government's State of Environment Reporting.	DEH
	DEH

ACTIONS	LEAD AGENCY
<b>2.1.1 Develop and Implement Marine Plans</b>	
Test the concept of marine planning through the release of a pilot Spencer Gulf Marine Plan for public consultation.	DEH
Identify areas of ecological significance through the development of Marine Plans based upon marine bioregions.	DEH
<b>2.1.2 Establish Marine Protected Areas</b>	
Protect representative areas of ecological significance as multiple-use Marine Protected Areas under the SARSMPA program.	DEH
Protect critical habitats for fisheries management.	PIRSA
Protect marine areas of regional significance.	DEH
<b>2.1.3 Establish the Adelaide Dolphin Sanctuary</b>	
Create by statute a dolphin sanctuary in the Port River and Barker Inlet with the primary aims of protecting dolphins and improving the quality of this environment.	DEH
<b>2.1.4 Improve Protection of Threatened and Rare Species</b>	
Develop a list of threatened, rare and vulnerable marine species for legislative protection.	DEH
Cooperate with the Commonwealth and States to develop and implement threatened species recovery plans for priority species.	DEH
<b>2.1.5 Develop Naturelinks</b>	DEH
<b>2.1.6 Protect Fish Breeding Grounds</b>	
Identify and protect important fish breeding grounds in conjunction with the fishing industry.	PIRSA
<b>2.1.7 Protect Estuarine Habitats</b>	
Develop flow control mechanisms in the Murray Mouth area to maximise ecological benefit.	DWLBC
<b>2.1.8 Protect and Manage Coastal Wetlands</b>	
Develop operational policies and management plans for the conservation of important coastal, estuarine and marine wetlands in South Australia.	DEH
<b>2.1.9 Protect Significant Coastal Habitats</b>	
Investigate the addition of representative areas of coastal habitats to South Australia's protected areas system.	DEH
Form partnerships with local government and communities to better manage coastal habitats such as coastal dune and cliff-top habitats.	DEH

ACTIONS	LEAD AGENCY
<b>2.2 Provide Formal Legislative Protection</b>	
Amend the Crown Lands Act 1929 to provide for single ministerial responsibility for care control and management of Crown lands and improve efficiency and effectiveness in administrating and managing the marine, coastal and river front Crown holdings.	DEH
Strengthen provisions under the Crown Lands Act 1929 to enable effective management of Crown lands with significant conservation values.	DEH
Develop legislative arrangements for the protection and management of MPAs under the SARSMPA.	DEH
Regularly review penalties for the destruction of coastal, estuarine and marine native vegetation.	DWLBC
<b>2.2.1 Develop and Implement New Biodiversity Legislation</b>	
Develop a Biodiversity Conservation Act for South Australia.	DEH
Develop a State Biodiversity Strategy, which encompasses coastal and marine biodiversity.	DEH
<b>2.3 Rehabilitate Degraded Habitat</b>	
Incorporate coastal and marine rehabilitation into NRM Plans focussing on priority areas.	DWLBC
<b>2.4 Mitigate and Manage Invasive Species</b>	
<b>2.4.1 Manage Coastal Pest Plants</b>	
Address the spread of coastal pest plants and identify measures to prevent new species from establishing.	DWLBC
<b>2.4.2 Manage Marine Pest Species and Aquatic Animal Disease Emergencies</b>	
Lead the implementation of the Australian Ballast Water Management Strategy at the State level.	DTUP
Lead the development of Port Management Plans.	DTUP
Encourage the undertaking of surveys of South Australia's major ports and marinas and assessment of the risks associated with shipping to and from these ports as the basis for development of port environmental management plans.	DTUP
Develop and implement coordinated national management arrangements at State level for barrier control, emergency response and management of existing pest species. Develop and support community and stakeholder groups to assist as an early warning system to report marine pest incursions.	PIRSA
Formalise local response plans based on the National Marine Pest Response Plan and local emergency management practices.	PIRSA
Raise awareness of the risks and consequences of marine pest incursions.	PIRSA
Develop the research capabilities in the State to provide information on the management and eradication of existing and potential marine pest species to South Australian waters.	PIRSA
Revise the State Response Plan for management of aquatic animal diseases to include a greater number of species in surveillance programs and to support research to identify and control pathogens of aquatic animals.	PIRSA
Review effectiveness of aquaculture stock recovery plans and escape minimisation plans.	PIRSA
Investigate environmental risks arising from the escape of farmed species including the potential for introduction of exotic pests and diseases.	PIRSA

ACTIONS	LEAD AGENCY
<b>2.5 Protect Indigenous Heritage</b>	
<b>2.5.1 Maintain Effective Partnerships with Indigenous Communities</b>	
Maintain effective communications with indigenous communities and relevant heritage committees to support strong on-going partnerships to implement programs that protect sites of significance.	DAARE
<b>2.5.2 Facilitate Compliance with Relevant Indigenous Heritage Legislation</b>	
Provide advice to enable recognition and protection of indigenous heritage and promote best practice management of indigenous heritage sites.	DAARE
<b>2.6 Protect European Heritage</b>	
<b>2.6.1 Protect Maritime Heritage Assets</b>	
Locate mooring buoys at significant sites to prevent damage to cultural and natural heritage.	DEH
<b>2.6.2 Improve Public Awareness of Maritime Heritage</b>	DEH
<b>OBJECTIVE 3. TO CONTROL POLLUTION OF OUR COASTAL, ESTUARINE AND MARINE ENVIRONMENTS</b>	
<b>3.1 Conduct a Risk Assessments</b>	
Identify and prioritise risks to coastal, estuarine and marine environments from pollution.	EPA
Implement the findings from the Adelaide Coastal Waters Study.	EPA
<b>3.2 Reduce Pollution from Land Sources</b>	
Minimise high nutrient effluent discharge to the marine environment from major wastewater treatment plants.	EPA
Increase the use of recycled effluent and reduce marine discharges through continuing partnerships between DWLBC, other government agencies, CSIRO and industry.	DWLBC
Actively encourage Catchment Water Management Boards/Regional Natural Resource Management Boards and local government to develop integrated water quality and stormwater management strategies.	DWLBC
Implement strategies to reduce diffuse pollution of watercourses and stormwater drains discharging into marine waters.	DWLBC
Implement the Water Proofing Adelaide strategy, which will provide a strategic blueprint for water resource management in the Adelaide region for the next 25 years.	DWLBC
Develop Codes of Practice linked to the Environment Protection (Water Quality) Policy to address the management of diffuse pollution sources and improve stormwater quality.	EPA
<b>3.3 Minimise Marine Pollution</b>	
<b>3.3.1 Improve Environmental Management of Aquaculture</b>	
Continue investigations into the environmental impact of aquaculture activities and ensure environmental considerations are paramount in assessing new aquaculture ventures.	PIRSA
Require the aquaculture industry to monitor and, where necessary, modify existing farm practices.	PIRSA

<b>ACTIONS</b>	<b>LEAD AGENCY</b>
<b>3.3.2 Manage Ballast Water and Oil Spills</b>	
Support implementation of the Australian Ballast Water Management Guidelines at the State level.	<b>DTUP</b>
Review and expand the Ballast Water Decision Support System and incorporate into State legislation as necessary.	<b>DTUP</b>
Endeavour to ensure that all tankers entering South Australian waters meet the highest international standards of construction and operations.	<b>DTUP</b>
Ensure that all costs from oil spills, including environmental rehabilitation and monitoring, are met by those responsible.	<b>DTUP</b>
Subject to the Commonwealth adopting Annex IV (the Prevention of Pollution by Sewage from Ships) ahead of international ratification, adopt the Annex in the Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987.	<b>DTUP</b>
Give the EPA effective and necessary authority to protect gulf waters from pollution.	<b>EPA</b>
<b>3.3.3 Control Sea Dumping</b>	
Review and proclaim the Environment Protection (Sea Dumping) Act 1984.	<b>EPA</b>
Negotiate with the Commonwealth to bring 'coastal waters' within the control of the South Australian Government by demonstrating compliance with the London Protocol.	<b>EPA</b>
<b>3.3.4 Control Dredging</b>	
Control dredging to reduce impact on the marine environment.	<b>EPA</b>
<b>OBJECTIVE 4. TO PROTECT OUR COASTAL, ESTUARINE AND MARINE ENVIRONMENTAL ASSETS BASED ON BEST UNDERSTANDING OF PHYSICAL COASTAL PROCESSES</b>	
<b>4.1 Develop a Strategic Vision for Coastal Development</b>	
Develop a clear strategic vision for the State on coastal planning and development.	<b>DEH/ PLANNING SA</b>
Identify quality landscapes on the coast at risk of development.	
Protect landscape qualities and amenity values through appropriate polices in Development Plans through the Plan Amendment Reports process.	

ACTIONS	LEAD AGENCY
<b>4.2 Protect Coastal Assets</b>	
Review the Adelaide Metropolitan Coast Protection Strategy.	DEH
Manage risks to Adelaide metropolitan coastal assets by beach replenishment and using structures to slow littoral drift.	DEH
Develop a Coast Protection Strategy for the whole of the South Australian coast.	DEH
Determine risks to South Australia's coastal assets from physical changes through surveys and monitoring.	DEH
Undertake a risk assessment of coastal hazards such as coastal erosion, flooding, cliff collapse and coastal acid sulfate soils.	DEH
In conjunction with local government and the Commonwealth, develop a clear policy for government to management of sea level rise.	DEH
Establish principles for development in coastal acid sulfate soils areas to guide coastal development.	PLANNING SA
Provide technical advice to support property owner involvement in developing coastal protection strategies for at risk properties.	DEH
Provide technical advice and assistance to local government to manage coastal erosion and public access to coastal areas.	DEH
<b>4.3 Establish Effective Development Controls</b>	
Ensure coastal zoning is undertaken with regard to the vision for coastal areas, including ecological, social and economic values.	PLANNING SA
Provide for an Authority with greater powers of direction over coastal and marine development.	DEH
Ensure adequate compliance controls for local councils and the Government to deal effectively with planning and coastal development.	PLANNING SA
Implement an environmentally responsible framework for coastal and marine tourism development management by both the private sector and government.	SATC
<b>4.4 Establish Effective Management of Coastal Lands</b>	
Amend the Crown Lands Act 1929 to provide for single ministerial responsibility for care control and management of Crown lands and improve administration and management of marine, coastal and river front Crown holdings.	DEH
Assist proposed NRM Boards to address the protection of coastal and estuarine assets.	DEH

ACTIONS	LEAD AGENCY
<b>OBJECTIVE 5. TO IMPROVE UNDERSTANDING OF OUR COASTAL, ESTUARINE AND MARINE ENVIRONMENTS</b>	
<b>5.1 Increase Knowledge to Inform Decision-Making</b>	
Develop a mechanism to fund integrated research programs to support the broader management and planning agenda for the State's coastal, estuarine and marine environments.	<b>SARDI</b>
Endorse the ongoing development of MISA as a whole of government strategy for focussing marine and aquatic research and development capability in the State towards the sustainable development and conservation of marine and aquatic resources and the environments on which they depend.	<b>DEH</b>
Develop the State's research and development capability in coastal, estuarine and marine environmental research through support for MISA and other programs.	<b>SARDI</b>
Develop a mechanism to build the State's marine conservation specific research programs and to fund programs that assess the current status and integrated function of South Australia's marine biodiversity.	<b>SARDI</b>
Develop mechanisms to fund capacity building to adequately describe marine species and ecosystems, evaluate threatened status of marine species and coordinate threatened marine species recovery planning.	<b>DEH</b>
<b>5.2 Monitor and Share Information</b>	
Regularly review coastal, estuarine and marine aspects in the Government's high level strategic document Green Print SA, which illustrates major policy commitments.	<b>DEH</b>
Identify indicators and assessment methodologies to enable effective monitoring and reporting of the ecological, social and economic changes in the coast and marine environment for SoE Reporting.	<b>DEH/PIRSA</b>
Develop the State's research capacity to assess and monitor the performance of MPAs and the impacts of resource use on marine ecology.	<b>DEH</b>
Engage non-government organisations and the broader community on 'Reefwatch', 'Feral or in Peril' and other marine ecosystem monitoring programs in South Australian waters.	<b>DEH</b>
Investigate the development of an integrated system for the collection, storage, analysis and synthesis of all coastal and marine data collected by agencies and organisations, including publicly funded research, and develop systems for management and access.	<b>DEH</b>
<b>5.3 Raise Community Awareness and Education</b>	
Support the Coast and Marine Education Framework to encourage community responsibility and stewardship of the marine environment through education.	<b>DEH</b>
Develop the State's marine education capability in coastal, estuarine and marine conservation through support for interpretive programs.	<b>DEH</b>
Develop individual Users' Codes of Conduct to encourage tourists and other recreational users to adopt environmentally friendly and safety conscious behaviour in all State waters and to promote sensitive and responsible use of marine and coastal environments.	<b>SATC</b>
Revamp the EPA's Stormwater Pollution Prevention Codes of Practice into a consolidated Stormwater Code with associate guidelines for specific industries as an initiative to reduce stormwater pollution.	<b>EPA</b>

<b>ACTIONS</b>	<b>LEAD AGENCY</b>
<b>OBJECTIVE 6. TO DEVELOP AND MAINTAIN PARTNERSHIPS BETWEEN STATE AND LOCAL GOVERNMENTS, COMMUNITY AND INDUSTRY</b>	
<b>6.1 Establish Management Responsibilities Between State and Local Government</b>	
Review management and funding responsibilities for coastal management during the development of the new Coast and Marine Act.	<b>DEH</b>
<b>6.2 Maintain Partnerships and Joint Responsibility</b>	
Once agreement is reached on allocation of responsibilities, support South Australian coastal councils in exercising their responsibilities through council's or regions of council's developing regional and local coastal strategies to guide management of the coastal areas in their jurisdictions.	<b>PLANNING SA</b>
<b>6.3 Promote Support and Ownership Across the Community</b>	
Provide opportunities for encouraging community and industry involvement in decision-making on local environment issues to encourage a greater sense of responsibility, understanding and 'ownership' of coastal, estuarine and marine environment decisions.	<b>ALL</b>
Maintain partnerships with coastal, estuarine and marine environment users such as Reef Watch, Water Watch and Fishwatch.	<b>DEH</b>



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and Heritage