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# Marine Parks

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## Environmental, Economic and Social Values of the Western Kangaroo Island Marine Park

### PART 1



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### PART 2 AN ATLAS OF MAPS

An atlas of maps containing environmental, economic and social/cultural information for this marine park has been produced as Part 2 of the Values Statement. The maps provide details specific to this park in a user-friendly visual format and may be viewed and downloaded from <http://www.marineparks.sa.gov.au>.



## **Western Kangaroo Island Marine Park**

Located in the Eyre Bioregion, the Western Kangaroo Island Marine Park covers 1,020 km<sup>2</sup> and is situated between Cape Forbin and Sanderson Bay, including the Casuarina Islets and Lipson Reef. The marine park includes both the North and South Casuarina Islets (as part of Flinders Chase National Park) and partially overlays Ravine des Casoars and Cape Torrens Wilderness Protection Areas up to median high water.

# 1 ENVIRONMENTAL VALUES

## 1.1 Ecosystem services

Ecosystems provide many critically important services that people benefit from, often at no direct cost to us. Examples of ecosystem services provided by coastal and marine habitats are shown in the following table. It is important to ensure that ecosystem health and integrity are maintained so that ecosystems continue to provide these services to us all.

Table adapted from McLeod, K and Leslie, H (2009).

	Life supporting services				Resources and products				Maintain earth's living space						Recreational and cultural services					
	Biogeochemical processes	Biophysical processes	Biodiversity	Nutrient cycling	Food	Fibre, fuel, shells etc	Non-biological materials (eg minerals)	Pharmaceuticals & nutraceuticals	Climate regulation	Waste processing	Flood/storm protection	Water flow/circulation	Erosion control	Water quality	Sediment quality	Cultural and amenity	Recreation and tourism	Aesthetics	Spiritual, religious, lifestyle	Education and research
Coastal, estuarine and marine habitat types																				
Bare sand	x	x	x	x	x	x	x		x		x		x	x	x	x	x	x	x	x
Reef (granite, limestone, calcarenite or low profile platform reef)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Water column	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x
Bedrock platform	x	x	x	x	x	x	x	x	x	x			x			x	x	x	x	x
Sandy beaches (dunes, coarse sand, fine sand)	x	x	x	x	x	x	x		x		x				x	x	x	x	x	x
Other beaches (boulder, pebble/cobble, mixed)	x	x	x	x	x	x	x		x		x	x		x	x	x	x	x	x	x

The Western Kangaroo Island Marine Park will be designed to conserve examples of habitats and species found in the Eyre Bioregion. Habitats, species and natural processes found here are summarised below.

## 1.2 Physical influences

Physical influences shape the type of habitats and species found in an area. Physical influences typical of this region include:

- seasonal sea surface temperatures ranging from averages of 26°C in summer and 12°C in winter;
- the Leeuwin current<sup>1</sup> from the west and the Flinders Current<sup>2</sup> from the south-east;
- seasonal nutrient rich upwellings;
- moderate to low exposure to wind and wave conditions creating semi-sheltered waters on the north coast of Kangaroo Island;
- full exposure to strong winds and wave/swell conditions on the western and southern coasts of Kangaroo Island.

## 1.3 Habitat variety

**Table 1** Benthic (subtidal) habitats found in the Western Kangaroo Island Marine Park

Benthic Habitat**	Area (km <sup>2</sup> )*	% of park
Bare sand	111	11%
Heavy limestone reef	59	6%
Unmapped	850	83%

\* habitat areas have been rounded to the nearest whole number

\*\*habitats included are those found from mapping at a resolution of 1:100,000

**Table 2** Shoreline (intertidal) habitats found in the Western Kangaroo Island Marine Park

Shoreline Habitat	Length in park (km)*	% of park length
Boulder beach	1	1%
Bedrock platform	81	90%
Coarse sandy beach	1	1%
Fine sandy beach	7	8%

\* habitat lengths have been rounded to the nearest whole number

Habitats of Western Kangaroo Island Marine Park include rugged, exposed cliffs and headlands and small pocket beaches. The reefs extend from intertidal wave-cut shore platforms to depths of up to 50 metres, with sandy seafloor habitat occurring at a range of depths.

The nearshore area surrounding Cape Borda comprises reefs, pebble beaches, small sandy beaches and sandy seafloor habitats.

The freshwater input from numerous estuaries located along the western coastline influences the type of marine life found in the area. These include Rocky River, Breakneck River, Ravine De Casoars and De Mole River estuaries. Estuaries provide habitats for a large number of organisms and support very high productivity. Estuaries provide habitat for many fish nurseries.

## 1.4 Marine species

The many habitats located within the Western Kangaroo Island Marine Park support a variety of marine and coastal species, some of which have been identified as ecologically important. Refer to Appendix 1 for a more detailed list of species. The Western Kangaroo Island Marine Park features:

<sup>1</sup> The Leeuwin Current originates in the tropical Indian Ocean, flows south along the Western Australian coast, and turns east along the shelf break to the Great Australian Bight, bringing warm, relatively low nutrient waters (Middleton & Bye 2007).

<sup>2</sup> The Flinders Current is a deep south-east to west current which is thought to flow from the west Tasmanian shelf to Cape Leeuwin and increases in flow speed from south-east (5cm / second) to west (20cm / second). (Middleton & Bye 2007).

- red algae species that have a nationally limited range;
- fish species of conservation concern such as the western blue groper, harlequin fish and western blue devil;
- haul-out sites for the Australian sea lion and regionally significant breeding sites for the New Zealand fur seals;
- feeding grounds for migratory cetaceans; and
- protected species of albatross.

#### 1.4.1 *Plants and algae*

High species diversity of red and green macroalgae can be found in the western and south western areas of the park. The red algae species *Anotrichium towinna* and *Leptoklonion fastigiatum* have been recorded around Cape du Couedic, both of which have a nationally recognised limited range. Areas of the north-west coast host a high biodiversity of canopy-forming large brown species and red understory species.

#### 1.4.2 *Bony fish, sharks and rays*

The north-west coast of Kangaroo Island supports a high diversity of fish, particularly reef species. Many commercial and recreational fish species are known to use the habitats in these areas for different stages of their life cycles including juvenile Western Australian salmon, Australian herring, King George whiting, wrasse species and snapper.

Western blue groper and harlequins, both known to be of conservation concern, inhabit many of the reefs throughout the park. These fish have been identified as long-living, site attached species which are particularly vulnerable to fishing as they are susceptible to fishing pressure.

The nationally *vulnerable* white shark and the school shark (identified as conservation dependent) have been recorded at some locations in the park. The shortfin mako and porbeagle are also known to visit the park and were recently listed for protection under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). Another species found in the park is the dusky whaler which has been nominated for listing under the EPBC Act. Other sharks or rays of conservation concern in the area include coastal stingaree, whitespotted spurdog, spotted wobbegong, blue shark and smooth hammerhead.

#### 1.4.3 *Marine mammals*

Regionally significant breeding colonies of New Zealand fur seals are located at Cape du Couedic and Casuarina Islets. Haul-out sites for small populations of the nationally and state listed *vulnerable* Australian sea lion are scattered throughout the park including those at North and South Casuarina Islet, West Bay (Paisley Islet), Cape Borda and near Admirals Arch.

The area's deeper waters are thought to be important feeding grounds for migratory cetaceans including many of conservation concern, such as sperm whales, pygmy sperm whales, dwarf sperm whales, pygmy right whales, short-finned pilot whales, false killer whales, some species of beaked whales and Risso's dolphin, all of which are nationally protected. Nationally *endangered* and state *vulnerable* southern right whales appear seasonally, as part of their regular migration path. Pygmy blue whales have been known to feed in the area during the summer-autumn upwelling. A pod of southern right whale dolphins has been seen off southern Kangaroo Island, something rarely recorded in Australia. It is an Antarctic species, but may use the region as seasonal habitat.

#### 1.4.4 *Seabirds and local and migratory shorebirds*

Estuaries and coastal wetlands of national importance, including Rocky River and Breakneck River, are linked to the marine park and provide habitat for local and migratory shorebird species protected under international treaties. Beaches in the area provide important nesting habitat for the state *vulnerable* hooded plover, while the cliffs and headlands offer nesting sites for raptors such as the state *endangered* osprey and white-bellied sea eagle. In particular, the cliffs along Cape Torrens Wilderness Area provide an important breeding site for the white-bellied sea eagle.

The North Casuarina Islet is a known breeding area for the nationally protected Pacific gull, crested tern and rock parrot, while the South Casuarina Islet is used by the state *rare* ruddy turnstone, state

rare sooty oystercatcher and Pacific gull for breeding. West Bay Inlet is a breeding location for populations of the sooty oystercatcher, crested tern and Pacific gull.

The state *vulnerable* southern giant petrel, as well as many migratory albatross species such as the nationally and state listed *vulnerable* shy albatross and the state *endangered* yellow-nosed albatross have been recorded in the area surrounding Flinders Chase National Park. Other species found there include the state *rare* Cape Barren goose, musk duck, fleshy-footed shearwater and eastern reef egret, and the state *endangered* fairy tern.

#### 1.4.5 Marine invertebrates

A high diversity of invertebrate species such as sponges and ascidians can be found on the north-west coast of the island. The specimen shell *Zolla marginate*, and others of conservation concern, occur on the sandy reef and sponge habitat in the northern area of the park.

Reef habitats throughout this park provide important shelter for the southern rock lobster and abalone species.

For further environmental and social information refer to <http://www.marineparks.sa.gov.au>

## 2 ECONOMIC VALUES

The marine environment is an important source of wealth for South Australia and its coastal communities. Marine parks will be designed to accommodate existing economic activities wherever possible. The main economic activities in the Western Kangaroo Island Marine Park are summarised below. Information in the Commercial fishing sections was provided by PIRSA.

### 2.1 Commercial fishing

The commercial fisheries that operate in the Western Kangaroo Island Marine Park are:

- Central Zone Abalone Fishery;
- Northern Zone Rock Lobster Fishery;
- Sardine Fishery; and
- Marine Scalefish Fishery (Gulf St Vincent/Kangaroo Island).

The value of each of these fisheries, including the direct and flow-on values, as well as the number of employees and export values, where available, are listed below. Note that the values provided below are for the entire area of the fishery and may not be specific to the Western Kangaroo Island Marine Park.

**Table 3.** The 2008/09 economic value of fisheries operating in the marine park for relevant fishery areas (figures are not specific to the park area and include catches from outside the marine park boundary).

	Catch value(\$m)	Value of flow-on to other sectors (\$m)	Fishing (FTE) employment	Flow-on (FTE) employment
<b>Abalone (State)</b>	30	45.2	90	225
<b>Abalone (Central Zone)</b>	5.7			
<b>Northern Zone Rock Lobster</b>	19.3	34.2	155	169
<b>Sardines (State)</b>	17.5	22.7	48	110
<b>Marine Scalefish (Gulf St Vincent/ Kangaroo Island)</b>	7.2	6.0	192	34

EconSearch 2010 a, b, c and d.

These fisheries are important to regional economies of the area both directly, through employment in each fishery, and indirectly, through a range of additional services such as processing, local

transport, marketing, local retail and food services. Each of these activities generates flow-on effects to other sectors, through purchases of inputs and employment of labour.

The abalone fishery targets greenlip and blacklip abalone. The park lies within the Central Zone Abalone Fishery, which produced 18% of the State's total harvest in 2008/09.

The park is part of the Northern Zone Rock Lobster Fishery, which operates from November to May. The northern zone contributes around 20% of the \$105m state-wide catch of southern rock lobster. Southern and western Kangaroo Island is an important area for this fishery.

The South Australian fishery for Australian sardine is the largest fishery by volume in Australia and is based out of Port Lincoln. Important waters include lower Eyre Peninsula and lower Spencer Gulf, including off the western end of Kangaroo Island. The fishery has expanded rapidly over the past decade, providing a key source of feed for the growing aquaculture industry based in Port Lincoln.

The Marine Scalefish Fishery is a diverse multi-species, multi-gear fishery that operates across State waters, targeting four key species: snapper, King George whiting, southern garfish and southern calamari.

Fishing charters also operate in this region.

For further information or to view maps of the fishing regions visit:

[http://www.sardi.sa.gov.au/\\_data/assets/pdf\\_file/0010/99739/No\\_305\\_South\\_Australian\\_Wild\\_Fishes\\_Information\\_and\\_Stats\\_report\\_200708\\_published.pdf](http://www.sardi.sa.gov.au/_data/assets/pdf_file/0010/99739/No_305_South_Australian_Wild_Fishes_Information_and_Stats_report_200708_published.pdf)

## ***2.2 Transport and infrastructure***

Transport and infrastructure provide an important economic contribution to the region, providing for maritime activities such as: shipping ports for import and export of goods; boat ramps for launching of recreational or commercial vessels; jetties for fishing; and breakwaters and groynes for coastal management.

## ***2.3 Local tourism***

Kangaroo Island is a premier tourism drawcard with an abundance of nature-based tourism opportunities on offer including swimming, fishing, boating, surfing, scuba diving, walking, and wildlife viewing. In 2008-09 Kangaroo Island attracted over 180,000 visitors who spent over 670,000 nights in the region, spending an estimated \$107m.

In 2008/09 77% of tourists observed and interacted with native animals and wildlife on the island. Going to the beach has become more popular over the last three years from 41% in 06/07 to 49% in 08/09. Visitors also enjoy other marine activities such as boating/fishing (15%) and scuba diving/snorkelling (6%). Notable tourist destinations adjacent to the marine park include Flinders Chase National Park and Cape Borda which are visited by 81% and 23% of visitors to the island respectively.

Tourism provided an important employment opportunity for Kangaroo Islanders. As a result the proportion of the Kangaroo Island population employed in tourism is significantly higher than that for other regions in the state. In June 2007 there were more than 200 tourism related businesses in the region, of which 42% were micro or small businesses.

# **3 SOCIAL VALUES**

The marine environment is an important recreational asset for coastal communities. Marine parks will be designed to accommodate existing recreational activities wherever possible. This section highlights the social values of the Western Kangaroo Island Marine Park and is separated into four parts:

- Aboriginal and European cultural heritage;
- scenic values
- recreational activities and popular locations; and
- interpretive and educational opportunities.

### **3.1 Aboriginal heritage**

Aboriginal people have interacted with the marine environment for thousands of years and their relationships with the sea remain strong through customs, laws and traditions. Traditional usage, Aboriginal cultural heritage, Indigenous Protected Areas (IPAs), Indigenous Land Use Agreements (ILUAs) and Native Title considerations will be taken into account in developing the management plan for the Western Kangaroo Island Marine Park.

#### *3.1.1 Language Groups*

The Ngarrindjeri and Kurna Aboriginal people may have had traditional associations with Kangaroo Island, including the marine environment and associated marine life. Aboriginal aspirations for this area are not known by the Department of Environment and Natural Resources.

#### *3.1.2 Agreements and Claims*

There are currently no Native Title Claims or registered ILUAs included in the marine park.

The Government is aware that there may be confidential Aboriginal heritage sites in South Australia's coastal areas. Where possible, these sites will be considered in the planning process. Future management plans will ensure these heritage sites are appropriately respected.

### **3.2 European heritage**

Where possible, the management plan for the Western Kangaroo Island Marine Park will recognise and complement sites of cultural and maritime heritage.

Matthew Flinders named Kangaroo Island in April 1802, but it was the French explorers Nicolas Baudin and Louis Freycinet in 1803 who were the first to chart and record the west and south coasts of the island, naming features such as Cape Borda, Ravine des Casoars, Cape Bedout, Maupertuis Bay and Cape du Couedic.

The Cape Borda Lighthouse was built high on the cliffs at the western entrance to Investigator Strait in 1858. Known originally as the Flinders Light it was the third lighthouse to be built in South Australia and is listed as a State Heritage Place and in the Register of the National Estate. Further east, Harveys Return, the landing place associated with the lighthouse, is also listed as a State Heritage Place. In 1908 a lighthouse was constructed at Cape du Couedic. The lighthouse is included on the Commonwealth Heritage Register and it and the store and jetty at nearby Weirs Cove are listed in the State Heritage Register and the Register of the National Estate.

Several ships were wrecked on the west coast of Kangaroo Island, despite construction of the lighthouses. One of the largest wrecks is that of the *Loch Vennachar* which disappeared with no survivors in 1905. Its sister ship, the *Loch Sloy*, was wrecked in Maupertuis Bay a few years earlier in 1899 and more recently the *Portland Maru* went down just off Cape Torrens in 1935. These wrecks are protected.

The spectacular coastal formations at Cape du Couedic and Remarkable Rocks are recognised as Geological Monuments, as are sites at Harveys Return, West Bay and Ravine des Casoars.

### **3.3 Scenic values**

The scenic quality of South Australia's coast is a significant social, economic and environmental resource. The coastline has high amenity value and includes high quality landscapes, also known as viewsapes. The significance or quality of viewsapes is derived from a combination of landform (relative relief, variety and complexity of landscapes), land cover (nature, scale and variety of vegetation), land use (impact of human activity), water, diversity, naturalism and colour.

The coastline of the Western Kangaroo Island Marine Park has high scenic values and includes some of the highest ranked areas of coastal scenic quality in the State (Lothian 2005).

High sheer cliffs dominate the entire extent of this coastline, ranging in height from 260 metres (Cape Torrens to Scott Cove) to 60 metres (West Bay). The steep and indented cliffs, headlands and bays between Cape du Couedic and Kirkpatrick Point (Remarkable Rocks) have the second-highest scenic values in the State. The remote and largely inaccessible western coast between Cape du Couedic and Cape Borda features high sheer cliffs with small inlets (Sandy Beach, Breakneck River and West Bay) and beaches and dunes (Maupertuis Bay). On the north coast, rugged cliffs, rising to 260m between Cape Torrens and Scott Cove, create spectacular coastal scenery.

Scenic values of the offshore islands have not been assessed.

Scenic values of coastline in the Western Kangaroo Island Marine Park (Lothian 2005).

Rating	Coastal landform type	Ranking
7.0 – 8.25	Headlands and bays	High
7.0 – 8.0	High Cliffs	High
6.75 – 7.25	Dunes	Moderate

For further information on coastal scenic values and viewsapes refer to <http://www.environment.sa.gov.au/coasts/management/coastal-viewsapes.html>

### **3.4 Recreational activities in the marine park**

The coastal and marine environments of the Western Kangaroo Island Marine Park are very popular with recreational fishers, boat users, divers and sightseers. The location of these activities is listed below.

#### *3.4.1 Recreational beach and boat fishing locations*

Recreational fishing is a popular past time in South Australia. Recreational fishers collectively harvest significant proportions of the total catch for a number of key species. The total number of recreational fishers for Western Kangaroo Island (region 20 and 21) during 07/08 was 11,190 which amounted to 32,743 days of fishing. (Note figures relate to regions used for reporting fishing activities and include catches from outside the marine park boundary). Blue swimmer crab was the most abundantly caught species followed by King George whiting, southern garfish, southern calamari and snapper for the Gulf St Vincent and Kangaroo Island region.

Recreational surf and rock fishing occurs at several locations around the coast and charter vessels provide further opportunities for fishing offshore.

#### *3.4.2 Popular surfing and swimming beaches*

Surfing and swimming in this marine park is limited due to the remoteness, extreme ocean conditions and limited accessibility to much of the coastline in this region.

#### *3.4.3 Popular diving locations*

The north-west coast of Kangaroo Island provides some spectacular opportunities for diving, particularly the near-shore reefs and around historic shipwrecks such as the *Portland Maru*. There are very few recreational dive sites on the western and south-western coast of Kangaroo Island due to the dangerous diving conditions and inaccessibility to most of the areas.

### **3.5 Interpretive and educational locations within the marine park**

The National Park and Wilderness Areas located adjacent to the marine park offer a range of interpretive opportunities. The area is also an important stop along the Kangaroo Island Shipwreck Trail.

## APPENDIX 1 SPECIES LIST

This list of some of the species identified in the Western Kangaroo Island Marine Park indicates the diversity of species found there.

### ***Bony fish, sharks and rays***

Australian herring	<i>Arripis georgianus</i>
Australian sardine	<i>Sardinops neopilchardus</i>
blue shark	<i>Prionace glauca</i>
coastal stingaree	<i>Urolophus orarius</i>
crested pipefish	<i>Histiogamphelus cristatus</i>
dusky whaler	<i>Carcharhinus obscurus</i>
harlequin fish	<i>Othos dentex</i>
King George whiting	<i>Sillaginodes punctata</i>
porbeagle	<i>Lamna nasus</i>
school shark	<i>Galeorhinus galeus</i>
shortfin mako	<i>Isurus oxyrinchus</i>
smooth hammerhead	<i>Sphyrna zygaena</i>
snapper	<i>Pagrus auratus</i>
southern garfish	<i>Hyporhamphus melanochir</i>
spotted wobblygong	<i>Orectolobus maculatus</i>
Western Australian salmon	<i>Arripis truttaceus</i>
western blue devil	<i>Paraplesiops meleagris</i>
western blue groper	<i>Achoerodus gouldii</i>
white shark	<i>Carcharodon carcharias</i>
whitespotted spurdog	<i>Squalus acanthias</i>
wrasse	Labridae

### ***Marine mammals***

Australian sea lion	<i>Neophoca cinerea</i>
dwarf sperm whale	<i>Kogia simus</i>
false killer whale	<i>Pseudorca crassidens</i>
New Zealand fur seal	<i>Arctocephalus forsteri</i>
pygmy blue whale	<i>Balaenoptera musculus brevicauda</i>
pygmy right whale	<i>Caperea marginata</i>
pygmy sperm whale	<i>Kogia breviceps</i>
short-finned pilot whale	<i>Globicephala macrorhynchus</i>
southern right whale	<i>Eubalaena australis</i>
southern right whale dolphin	<i>Lissodelphis peronii</i>
sperm whale	<i>Physeter catodon</i>

### ***Seabirds and local and migratory shorebirds***

Cape Barren goose	<i>Cereopsis novaehollandiae</i>
crested tern	<i>Sterna bergii</i>
eastern reef egret	<i>Egretta sacra</i>
fairy tern	<i>Sterna nereis</i>
fleshy-footed shearwater	<i>Ardenna carneipes</i>
hooded plover	<i>Thinornis rubricollis</i>
musk duck	<i>Biziura lobata</i>
osprey	<i>Pandion haliaetus</i>
Pacific gull	<i>Larus pacificus</i>
rock parrot	<i>Neophema petrophila</i>
ruddy turnstone	<i>Arenaria interpres</i>
shy albatross	<i>Thalassarche cauta</i>
sooty oystercatcher	<i>Haematopus fuliginosus</i>
southern giant petrel	<i>Macronectes giganteus</i>
white-bellied sea eagle	<i>Fregetta grallaria grallaria</i>

yellow-nosed albatross

*Thalassarche chlororhynchos*

***Marine invertebrates***

ascidian

Ascidiacea

blacklip abalone

*Haliotis rubra*

greenlip abalone

*Haliotis laevigata*

southern calamari

*Sepioteuthis australis*

southern rock lobster

*Jasus edwardsii*

sponge

Porifera

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