
Marine Parks

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Environmental, Economic and Social Values of the Upper South East Marine Park

PART 1



For further information, please contact:
Coast and Marine Conservation Branch
Department of Environment and Natural Resources
GPO Box 1047
ADELAIDE SA 5001

Telephone: (08) 8124 4900
Facsimile: (08) 8124 4920

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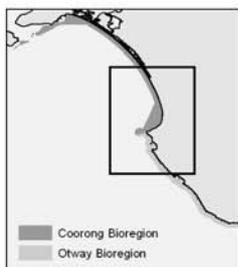
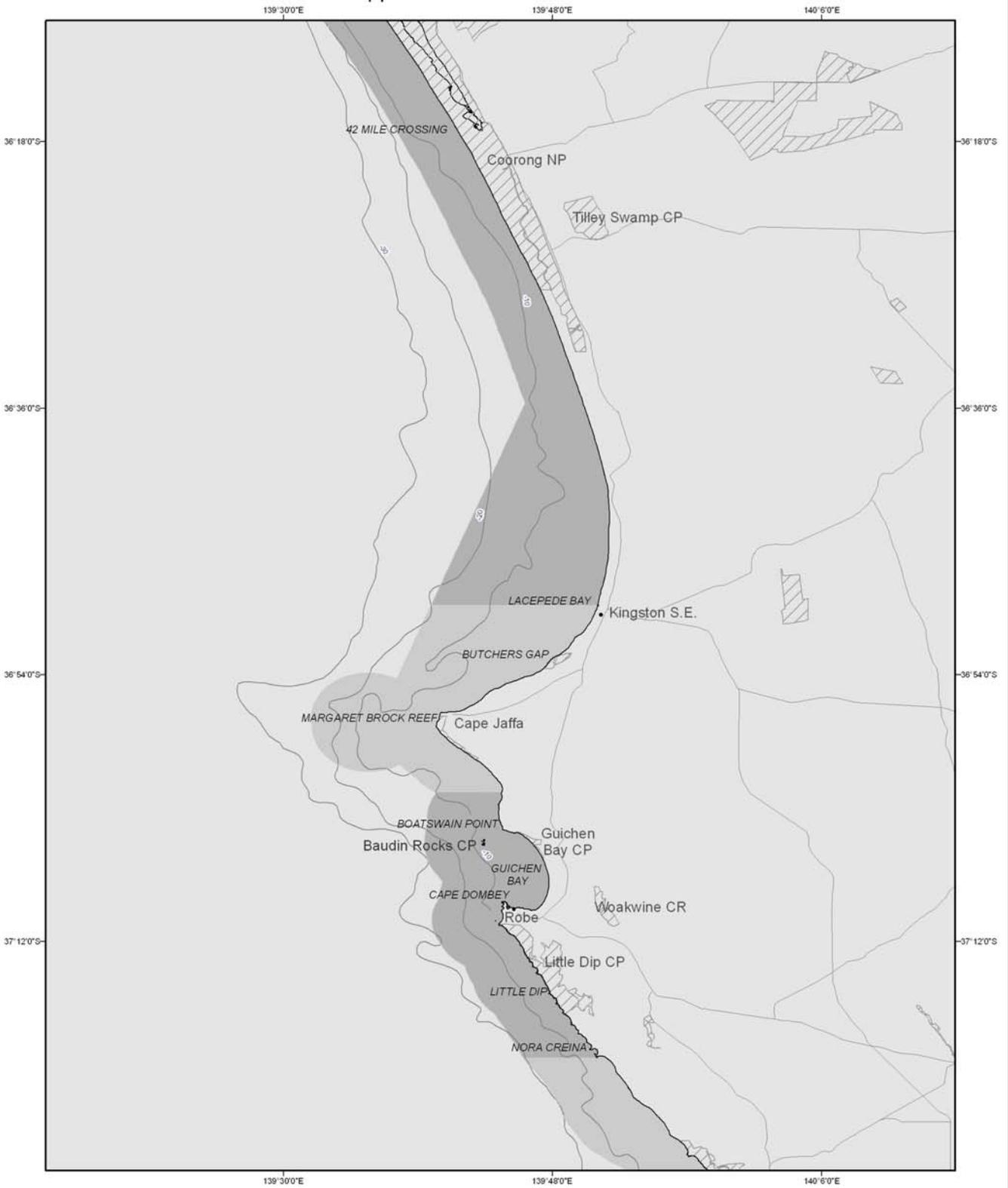
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PART 2 AN ATLAS OF MAPS

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>.

Upper South East Marine Park



- Marine Park
- State Waters Jurisdiction
- Parks and Reserves
- Bathymetry Contours
- Roads
- Coastline (median high water)



Produced by Coast and Marine Conservation
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www.environment.sa.gov.au/coasts

Data Source Marine Parks, NPWSA
 Bathymetry, Topographic Data - DEH
 Marine Bioregions - SARDI
 State Waters Jurisdiction - Geoscience Australia
 2 February 2010

Compiled Projection Datum
 Geocentric Datum of Australia, 1994

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DEH MapID: 2010-3324

Upper South East Marine Park

Overlapping both the Coorong and Otway Bioregions, the Upper South East Marine Park covers 906km² and is divided into two sections: from 11 km north of Tea Tree Crossing to the Maria Creek outlet in Kingston and from Wright Bay to the northern most point of Stinky Bay. This marine park overlays Baudin Rocks Conservation Park, partially overlays the Coorong National Park and Little Dip Conservation Park and is adjacent to Guichen Bay Conservation Park.

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
Seagrass	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
Water column	x	x	x	x	x	x	x	x	x		x	x		x	x	x	x	x	x	x
Cliffs	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

The Upper South East Marine Park will be designed to conserve examples of habitats and species found in the Coorong and Otway Bioregions. 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:

- average sea surface temperatures ranging from 14°C in winter to 18°C in summer, but decreasing to 11 – 12°C in summer due to the influence of the upwellings;
- the cool Flinders current¹;
- the nutrient rich Bonney upwelling from December to May;
- estuaries, creeks and drainage channels connecting the fresh and marine waters.

1.3 Habitat variety

Table 1 Benthic (subtidal) habitats found in the Upper South East Marine Park

Benthic Habitat**	Area (km ²)*	% of park
Bare sand	248	27%
Dense seagrass	167	19%
Heavy limestone reef	35	4%
Low profile platform reef	338	37%
Unmapped	117	13%

* 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 Upper South East Marine Park

Shoreline Habitat	Length in park (km)*	% of park length
Cliffs	9	7%
Coarse sandy beach	15	11%
Fine sandy beach	110	81%
Mixed beach	1	1%

* habitat lengths have been rounded to the nearest whole number

Habitats of the marine park include stretches of exposed, high energy sandy beaches backed by vast dune systems, rocky headlands, wave-cut shore platforms, fringing reefs, and extensive limestone reef formations.

Large amounts of seagrass and algae form beach wrack in some areas, particularly at Kingston and Stinky Bay. These deposits have significant ecological values in terms of nutrient recycling and providing carbon to form the basis of marine food webs.

1.3.1 Coorong – Maria Creek (Coorong Bioregion)

The Coorong coast contains the largest high energy dissipative beach in the southern hemisphere, backed by vast sand dunes and the Coorong Lakes. This area is part of one of Australia's longest continual sandy beaches running approximately 194km from the Murray Mouth to Cape Jaffa. Dense seagrass beds mixed with sandy patches are found in the shallow waters along Long Beach, while dense and extensive seagrass meadows are located in the near shore region of Lacepede Bay.

Also featured in this region are intertidal and offshore calcareous reefs at various depths, which are dominated by a variety of mixed macroalgae species.

¹ 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).

1.3.2 Wright Bay – Stinky Bay (Otway Bioregion)

The coastline in this region is one of the world's most energetic. Continual exposure to the high southwest swell of the Southern Ocean and onshore westerly winds result in high energy beach systems and extensive coastal dunes and barriers where offshore reefs are lacking. This section of coastline is also influenced by creeks and drainage channels entering the sea, such as Salt Creek (South East), Blackford Drain, Maria Creek and Robe Lakes Drain L.

Baudin Rocks Conservation Park includes a number of small rocky islands (Godfrey Islands) comprising a rugged, fragmented and eroded group of dry sandstone rocks and submerged reefs which support various brown, green and red algae. Sandy seafloors and limestone reefs can be found around Guichen Bay and Nora Creina. The reefs provide habitat for various attached and mobile invertebrates and a high diversity of brown, green and red macroalgae, including a number of species with limited range. Dense seagrass beds can also be found around Nora Creina.

The area around Little Dip Conservation Park is comprised of a complex dune system, beach, reefs and extensive inshore rocky platforms and rock pools.

1.4 Marine species

The many habitats located within the Upper South East 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 Upper South East Marine Park features:

- the eastern extent of *Posidonia sinuosa* at Lacedepe Bay;
- the protected Brigg's crested and javelin pipefish;
- nursery habitats for many species of commercial and recreational fish species; and
- only one of two breeding sites in the South East for the little penguin.

1.4.1 Plants and algae

Kelp forests are a distinctive feature of this region, and play an important role in coastal food webs and nutrient cycling. The presence of kelp forests demonstrates that the region has closer ecological links with Victorian and Tasmanian waters than with other South Australian waters. The kelp forests are dominated by giant kelp known as *Macrocystis angustifolia*, which occurs in this area from about 13 to 22m deep, and can grow up to 30m tall. Another large plant, bull kelp (*Durvillea potatorum*), is found in the intertidal and shallow subtidal on wave-exposed coasts. The shady sea floor beneath the kelp provides ideal conditions for many species of red algae. This is an important food source for grazing herbivorous snails such as abalone and pheasant shells.

Lacedepe Bay is the eastern extent of the seagrass species *Posidonia sinuosa*. The uncommon brown algae *Myriodesma leptophyllum* has been recorded in Lacedepe Bay, while the red algae *Griffithsia pilalyea*, which is believed to have a limited range, has been sighted near Kingston.

In the southern section of the park, red algal communities dominate subtidal areas from 4-10 m with a sparse community of brown macroalgae. The brown macroalgae *Ecklonia radiata*, with an understory of reds, dominate areas from 10-30 m. Sparse red algal communities are found in waters deeper than 30 m.

1.4.2 Bony fish, sharks and rays

Fish species of conservation concern including the western blue groper, brown-spotted wrasse, blue-throated wrasse and purple wrasse live in the near shore reefs surrounding Lacedepe Bay, Guichen Bay to Baudin Rocks and between Cape Dombey to Little Dip. The seagrass beds of Guichen Bay, particularly in the Robe area, provide habitat for pipefish including the less commonly known Brigg's crested pipefish and the javelin pipefish. The protected leafy seadragon and weedy seadragon have been recorded around Lacedepe Bay.

The seagrass beds of Lacedepe Bay provide nursery habitat for Western Australian salmon, Australian herring (tommy ruff), southern garfish, flathead species, leatherjacket species and trevally. Reef areas in this part, particularly those around Cape Dombey, Little Dip and Nora Creina are reported to be used by one or more of the life stages of recreationally and commercially

important fish species including King George whiting, Western Australian salmon, snapper, gummy sharks and whaler sharks.

The shortfin mako and porbeagle are known to visit locations throughout the park and were recently listed for protection under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). The dusky whaler has been nominated for protection under the EPBC Act. Other shark and ray species of conservation concern recorded in the area include the coastal stingaree, whitespotted spurdog, spotted wobblygong, blue shark, smooth hammerhead and school shark as well as the nationally *vulnerable* white shark.

1.4.3 Marine mammals

Baudin Rocks provide an important haul-out site for the nationally and state listed *vulnerable* Australian sea lion, state *rare* Australian fur seal and nationally protected New Zealand fur seal. New Zealand fur seals sometimes breed here in small numbers.

1.4.4 Seabirds and local and migratory shorebirds

More than a dozen bird species can be found on Baudin Rocks, including a regionally important breeding colony of crested tern and the state *rare* eastern reef egret and peregrine falcon. Other seabirds using the islands include a breeding population of pied cormorants, as well the nationally protected black-faced cormorant and little penguin. Baudin Rocks is one of only two breeding sites in the south east for the little penguin. The state *endangered* fairy tern has also been occasionally recorded nesting on these islands, as well as sites near Cape Dombey and Little Dip.

At sites along the Little Dip coastline the short-tailed shearwater and nationally protected Caspian tern have been seen. The area is also a known migration stop-over point for 13 species of shorebirds include the red-necked stint, Pacific golden plover, common greenshank and great knot. Migratory shorebirds feed and rest at the coastal wetlands, before returning to the northern hemisphere during the Australian winter. This area is considered to be a stronghold for the hooded plover in the south east, containing between three and twelve per cent of the species population at times.

1.4.5 Marine invertebrates

The South East is an important area for the southern rock lobster, with spawning areas and juvenile habitat located between Cape Dombey, Little Dip and Nora Creina. Kelp forests and associated communities, as well as deeper offshore calcareous reefs in Lacepede Bay and Guichen Bay, are locations where adult and juvenile lobsters live and feed.

Spawning and juvenile southern calamari, greenlip and blacklip abalone, Maori octopus and the purple sea urchin have also been recorded at reefs around Lacepede Bay, Cape Dombey, Little Dip and Nora Creina. Euphausiid krill are known to swarm in very large numbers and are preyed upon by a variety of seabirds, fish and mammals.

Endemic and uncommon species of ascidians and sponges, particularly in shallow waters to about 13 m have also been recorded throughout this marine park.

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 Upper South East Marine Park are summarised below. Information in the Aquaculture, Commercial fishing, and Mineral and energy resources sections have been provided by PIRSA.

2.1 Aquaculture

The South Australian aquaculture industry had a direct output value of \$324 million in 2008/2009 (EconSearch, 2010a). Marine species grown and harvested in South Australia include (but are not limited to) Pacific oysters and mussels (bivalve molluscs), southern bluefin tuna (prescribed wild caught tuna), and abalone, yellow-tail kingfish and other species of finfish (aquatic animals – other than prescribed wild caught tuna – which require regular feeding).

Table 3 The statewide economic value of aquaculture industries in South Australia, 2008/09 (excludes freshwater aquaculture)

	Gross value of on-farm production (\$m)	Value to downstream* sectors (\$m)	On-farm number of employees (FTE)	Number of employees in downstream* sectors (FTE)
Southern bluefin tuna (prescribed wild caught tuna)	\$157.8	\$16.0	348	58
Bivalve molluscs (oysters)	\$32.6	\$42.6	529	252
Finfish (other than prescribed wild caught tuna)	\$29.2	\$15.4	108	84
Bivalve molluscs (mussels)	\$2.5	\$2.8	114	16
Abalone	\$8.1	\$0	64	0
Other	\$10.9	\$0	44	0

EconSearch, 2010a

* Downstream activities include processing, transport, retail and food service.

An aquaculture zone is located in Lacedpede Bay. This zone allows for the farming of finfish. There are several finfish sites in the zone but none of these are currently located within the marine park boundary. A map showing current active sites, applications and aquaculture zone policies can be accessed online through the Aquaculture Public Register at:

http://www.pir.sa.gov.au/aquaculture/public_register

2.2 Commercial fishing

The commercial fisheries that operate in the Upper South East Marine Park are:

- Southern Zone Abalone Fishery;
- Southern Zone Rock Lobster Fishery;
- Marine Scalefish Fishery;
- Lakes and Coorong Fishery; and
- Miscellaneous Giant Crab Fishery.

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 Upper South East Marine Park.

Table 4 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
Abalone (State)	30	45.2	90	225
Abalone (Southern Zone)	4.8			
Southern Zone Rock lobster (South East)	85.4	49.3	414	285
Marine Scalefish#	22.6	50.8	526	248
Lakes and Coorong Fishery	8.4	19.1	62	92

EconSearch 2010 b, c, d and e.

State figures have been used as there were no figures available specifically for the South East.

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 abalone and blacklip abalone. The park lies within the Southern Zone Abalone Fishery which produced approximately 18% of the total State harvest in 2008/09. Most of the catch is blacklip abalone.

The Southern Zone Rock Lobster Fishery is the highest value fishery in the State directly contributing \$85.4 million in 2008/09. In 2007/08 the southern zone accounted for approximately 37% of the total wild fisheries value for South Australia. The fishery is divided into a number of Marine Fishing Areas (MFAs) with 2 of the MFAs covering the waters of the park. These MFAs account for a significant proportion of the southern zone catch.

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.

Lakes and Coorong Fishery licence holders have access to fish in Coorong coastal waters. Pipi (Goolwa cockle) are harvested in this area.

Fishing charters also operate from a number of locations throughout this region.

The Giant Crab Fishery is a small fishery with well established operators who fish in the area. The average catch in South Australia is 20t per year.

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_Fisheries_Information_and_Stats_report_200708_published.pdf

2.3 Mineral and energy resources

Currently, offshore South Australia is only lightly explored for oil and gas and no economic discoveries have been made; however, potential exists in the marine park for petroleum accumulations and access is needed for seismic surveying to delineate prospects. Potential also exists further offshore on the continental shelf and slope where recognised exploration targets are similar to those in prolific gas-oil provinces elsewhere in the world. Such discoveries may require access for landing pipeline infrastructure onshore.

The potential for offshore geothermal energy resources has not yet been addressed, however potential exists to utilise geothermal energy in adjacent coastal or inland water settings for a variety of purposes, including power for desalination plants.

The coastal and inshore section of Guichen Bay is partially covered by two geothermal exploration licences (GELs 214 and 498). Two Petroleum Exploration Licences (PELs 186 and 154) overlap part of this marine park while a third is located inshore from the coast near the park. Exploration Petroleum Permit 35 lies adjacent to the southern part of the park, in Commonwealth waters.

2.4 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; marinas and boat ramps for launching of recreational or commercial vessels; jetties for fishing; and breakwaters and groynes for coastal management.

2.5 Local tourism

The Limestone Coast is a major coastal tourism destination, both for South Australians and for visitors from Victoria. Popular activities include camping, fishing and visiting parks, as well as nature-based experiences.

In 2009, there were an estimated 488,000 overnight visitors to the Limestone Coast who stayed more than 1.5 million nights. Common activities undertaken by visitors to the Limestone Coast include going fishing (11%), visiting national parks (13%) and going to the beach (25%). On average, an estimated \$42m is spent annually in the Robe and Kingston local government areas by overnight visitors.

Annual fishing competitions, such as those at Robe and Kingston, are also popular tourism drawcards to the region and provide a boost to the local economy through expenditure on accommodation, food, bait, tackle and shopping.

In 2007/08, the Coorong National Park received around 141,000 visitors, the largest number of visitors compared to all other non-metropolitan parks in South Australia.

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 Upper South East 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 Upper South East Marine Park.

3.1.1 Language Groups

Three Aboriginal groups, the Ngarrindjeri, Buandig and Meantank people have traditional associations with areas of the marine park including the marine environment and associated marine life.

3.1.2 Agreements and Claims

The Ngarrindjeri native title claim (1998) is included in parts of the Upper South East Marine Park.

The Government is aware that there may be confidential Aboriginal heritage sites in South Australia's coastal areas. Where possible, these sites have been 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 Upper South East Marine Park will recognise and complement sites of cultural and maritime heritage.

Lieutenant James Grant of the Royal Navy was the first British person to describe the coastline and mountains of the South East region in 1800. Shortly after this, Nicolas Baudin and Louis Freycinet explored this coastline and named Cape Dombey, Cape Rabelais and Guichen and Lacepede Bays.

Robe was established in the late 1840s on the shores of one of the more sheltered bays on the south east coast and became the main shipping centre for the South East region. The State Heritage listed Cape Dombey Obelisk, and the slipway and seawall, adjacent to the marine park near the Royal Circus in Robe, are reminders of that maritime heritage. Lake Butler is recognised as a Local Heritage Place for its historical and landmark qualities.

Many shipwrecks lie within the park, some of them dating from relatively early days and nearly all of them driven ashore in storms. They include the *Sophia Jane* (1844), *Thomson* (1849), *Duillius* (1853), the *Phaeton* and *Koning Willem II* (1857) which are Protected. Many wrecks of the South East are included in the Southern Ocean Shipwreck Trail.

A number of conservation parks in the area are included in the Register of the National Estate.

Located adjacent to the marine park, the coastline from Kingston to the Piccaninnie Ponds Conservation Park is recognised as a geological monument for a variety of coastal formations and dune features.

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 Upper South East Marine Park has moderate-high scenic values (Lothian 2005).

South of Robe the indented rocky coastline of headlands and intervening sandy bays, backed by low dune blowouts, is included among the highest ranked areas of coastal scenic quality in the State. The wide curving beach and dunes of Guichen Bay are considered to have moderate scenic values, although the high energy beach and dunes along the entire northern portion of the marine park have some of the highest scenic values attributed to that landform type in the State.

Scenic values of coastline in the Upper South East Marine Park (Lothian 2005).

Rating	Coastal landform type	Ranking
7.5 – 8.0	Headlands and bays	High
6.75 – 7.25	Dunes and beaches (north of Blackford Drain)	High
6.0 – 7.0	Dunes and beaches (elsewhere in marine park)	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 Upper South East Marine Park are very popular with recreational fishers, boat users, snorkellers, scuba divers, swimmers, surfers and sightseers. The location of these activities is listed below.

3.4.1 Recreational beach and boat fishing locations

Recreational fishing is a popular pastime 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 the Upper South East (region 22 and 23) during 07/08 was 9,759 which amounted to 35,866 days of fishing. (Note figures relate to regions used for reporting fishing activities and include catches from outside the marine park boundary). Rock lobster, southern garfish and King George whiting were the most frequently caught species for the South East region.

Popular fishing spots are located at many points along the coast and include jetties, breakwaters, rocks or shore fishing at Wright Bay, Guichen Bay, Robe, Long Beach and Nora Creina targeting species such as whiting, mulloway, salmon and gummy sharks.

Boat ramps located at Kingston, Robe, Wright's Bay, Boatswain Point, Lake Butler and Nora Creina provide access to the marine park.

The annual Kingston Lions Club Surf Fishing Competition is held along the Coorong Beach from Kingston to Tea-Tree. An offshore fishing competition is also held from Robe each January.

3.4.2 Popular surfing and swimming beaches

Surfing locations in this marine park include sites near Robe and off Cape Lannes in Little Dip Conservation Park and at Long Beach. Surfers, kitesurfers and sailboarders converge on Robe for the annual Robe Easter Classic.

3.4.3 Popular diving locations

Dive sites located in the region include the many reefs just offshore from Robe, Cape Dombey, Baudin Rocks and 'The Black Pigs' (in Guichen Bay). The many headland sites and reefs offshore from Little Dip Conservation Park are also visited by divers when weather permits.

3.4.4 Other recreational activities in the park

Sailing is a popular activity in the marine park. Caravan parks and camping locations are located adjacent to the park at Robe, Little Dip and the Coorong.

3.5 Interpretive and educational locations within the marine park

This region is part of the Southern Ocean Shipwreck Trail, which extends from the Victorian border to the Murray Mouth. Interpretive signs are located along the trail.

APPENDIX 1 SPECIES LIST

This list of some of the species identified in the Upper South East Marine Park indicates the diversity of species found there.

Plants and algae

bull kelp	<i>Durvillaea potatorum</i>
giant kelp	<i>Macrocystis angustifolia</i>
kelp	<i>Ecklonia radiata</i>

Bony fish, sharks and rays

Australian herring	<i>Arripis georgianus</i>
Australian salmon	<i>Arripis truttaceus</i>
black ray	<i>Dasyatis thetidis</i>
blue shark	<i>Prionace glauca</i>
blue-throated wrasse	<i>Notolabrus tetricus</i>
brown-spotted wrasse	<i>Notolabrus parillus</i>
coastal stingaree	<i>Urolophus orarius</i>
crested pipefish	<i>Histiogamphelus cristatus</i>
dusky whaler	<i>Carcharhinus obscurus</i>
flathead	<i>Platycephalus bassensis</i>
gummy shark	<i>Mustelus antarcticus</i>
javelin pipefish	<i>Lissocampus runa</i>
King George whiting	<i>Sillaginodes punctata</i>
leafy seadragon	<i>Phycodurus equus</i>
leatherjacket	Monacanthidae
mulloway	<i>Argyrosomus japonicus</i>
pipefish	Signathidae
porbeagle	<i>Lamna nasus</i>
purple wrasse	<i>Notolabrus fucicola</i>
salmon	<i>Arripis truttaceus</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 bluefin tuna	<i>Thunnus maccoyi</i>
southern garfish	<i>Hyporhamphus melanochir</i>
spotted wobblygong	<i>Orectolobus maculatus</i>
trevally	<i>Pseudocaranx georgianus</i>
weedy seadragon	<i>Phyllopteryx taeniolatus</i>
Western Australian salmon	<i>Arripis truttaceus</i>
western blue groper	<i>Achoerodus gouldii</i>
whaler shark	<i>Carcharhinus brachyurus</i>
white shark	<i>Carcharodon carcharias</i>
whitespotted spurdog	<i>Squalus acanthias</i>
yellow-tail kingfish	<i>Seriola lalandi</i>

Marine mammals

Australian fur seal	<i>Arctocephalus pusillus doriferus</i>
Australian sea lion	<i>Neophoca cinerea</i>
New Zealand fur seal	<i>Arctocephalus forsteri</i>

Seabirds and local and migratory shorebirds

black-faced cormorant	<i>Phalacrocorax fuscescens</i>
Caspian tern	<i>Sterna caspia</i>
common greenshank	<i>Tringa nebularia</i>
crested tern	<i>Sterna bergii</i>

eastern reef egret
fairy tern
great knot
hooded plover
little penguin
Pacific golden plover
peregrine falcon
pied cormorant
red-necked stint

Egretta sacra
Sterna nereis
Calidris tenuirostris
Thinornis rubricollis
Eudyptula minor
Pluvialis fulva
Falco peregrinus
Phalacrocorax varius
Calidris ruficollis

Marine invertebrates

ascidian
blacklip abalone
Euphausiid krill
giant crab
Goolwa cockle
greenlip abalone
Maori octopus
mussel
Pacific oyster
pheasant shell
pipi
purple sea urchin
southern calamari
southern rock lobster
sponge

Asciacea
Haliotis rubra
Nyctiphanes australis
Pseudocarcinus gigas
Donax deltoides
Haliotis laevigata
Octopus maorum
Mytilidae
Crassostrea gigas
Phasianella australis
Donax deltoides
Heliocidaris erythrogramma
Sepioteuthis australis
Jasus edwardsii
Porifera

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