Marine Parks

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Environmental, Economic and Social Values of the Thorny Passage Marine Park

PART 1

www.marineparks.sa.gov.au

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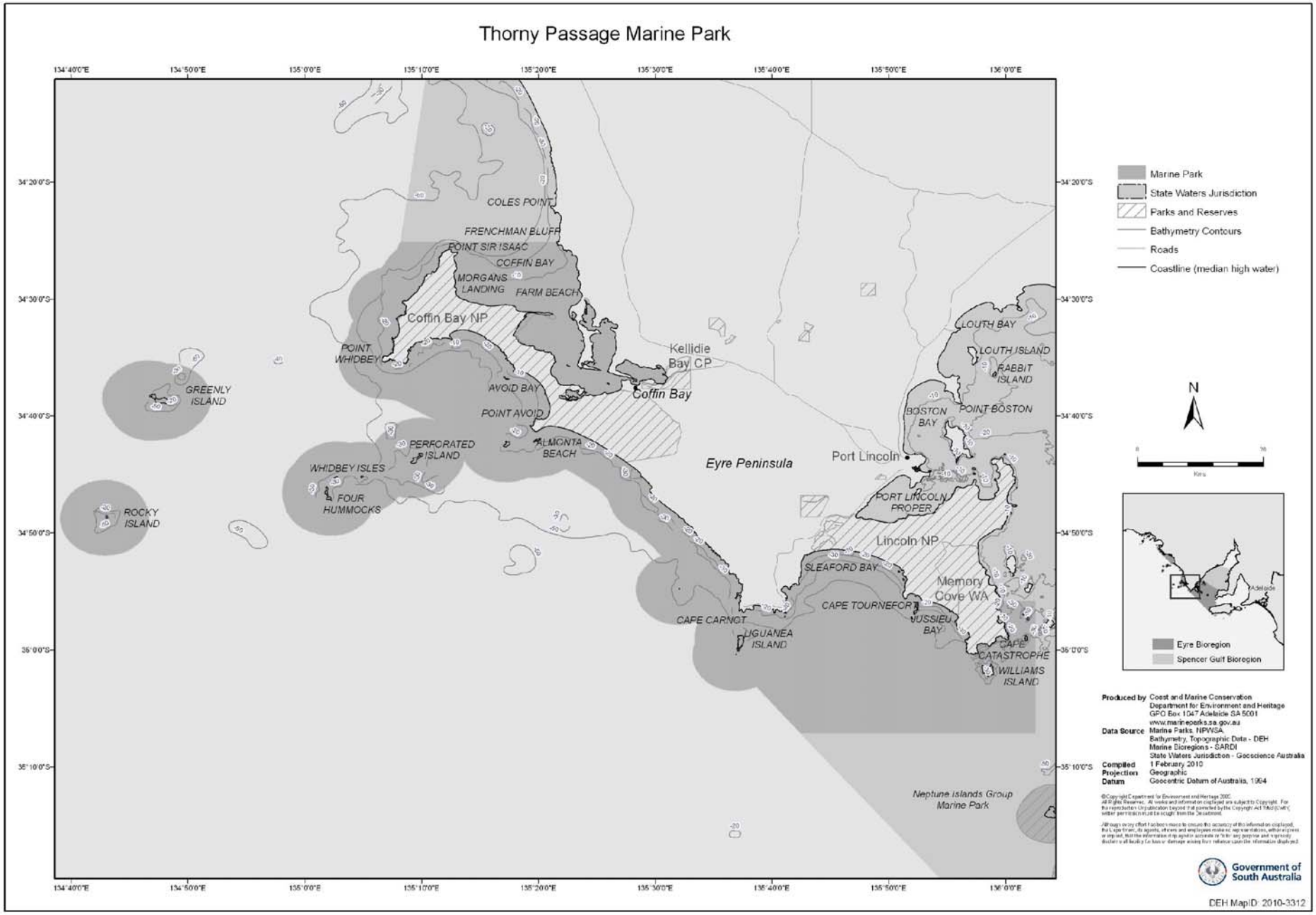
PART 2 AN ATLAS OF MAPS

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.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FARM BEACH
Coffin Bay NP
POINT WHIDBEY
GREENLY ISLAND
AVOID BAY
POINT AVOID
Kellidie Bay CP
Coffin Bay
PERFORATED ISLAND
ALMONTA BEACH
WHIDBEY ISLES
FOUR HUMMOCKS
ROCKY ISLAND
Eyre Peninsula
LOUTH BAY
LOUTH ISLAND
RABBIT ISLAND
BOSTON BAY
POINT BOSTON
Port Lincoln
PORT LINCOLN PROPER
Lincoln NP
SLEAFORD BAY
Memory Cove WA
CAPE TOURNEFORT
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Neptune Islands Group Marine Park
Marine Park
State Waters Jurisdiction
Parks and Reserves
Bathymetry Contours
Roads
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Eyre Bioregion
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State Waters Jurisdiction - Geoscience Australia
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Government of South Australia
DEH MapID: 2010-3312

Thorny Passage Marine Park

Thorny Passage Marine Park covers 2,472 km^2 and is located in the Eyre Bioregion. It includes the waters off lower Eyre Peninsula, extending from Frenchman Bluff on the west to Memory Cove on the east and overlays both Rocky and Greenly Islands.

This marine park encompasses several conservation parks including Greenly Islands, Rocky Islands, Whidbey Isles and Mount Dutton Bay Conservation Parks, as well as the islands associated with Lincoln National Park and Memory Cove Wilderness Area. Coffin Bay National Park, Lincoln National Park and Memory Cove Wilderness Protection Area are partially overlayed, the park also borders Kellidie 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				
Coastal, estuarine and marine habitat types	Biogeochemical processes	Biophysical processes	Biodiversity	Nutrient cycling	Food	Fibre, fuel, shells etc	Non-biological materials (eg minerals)	Pharmaceuticals & nutriceuticals	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
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	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
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
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	x
Other beaches (boulder, pebble/cobble, mixed)	x	x	x	x	x	x	x			x		x	x		x	x	x	x	x	x
Mudflats and sandflats	x	x	x	x	x	x	x			x		x			x	x	x	x	x	x
Saltmarsh	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

The Thorny Passage Marine Park will be designed to conserve examples of the 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:

- sea surface temperatures ranging from <12°C in winter to 22°C in summer;
- salinity averaging around 35 parts per thousand (ppt) with levels in some of the bays affected by evaporation;
- the warmer Leeuwin Current[1], from the west;
- the cooler Flinders Current[2], from the south-east;
- seasonal nutrient-rich upwellings.

1.3 Habitat variety

Table 1 Benthic (subtidal) habitats found in the Thorny Passage Marine Park

Benthic Habitat**	Area (km^2)*	% of park
Bare sand	576	23%
Dense seagrass	77	3%
Dense seagrass patches	1	<1%
Medium seagrass	8	<1%
Sparse seagrass	<1	<1%
Granite reef	40	2%
Heavy limestone reef	16	1%
Low profile platform reef	92	4%
Unmapped	1652	67%

* 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 Thorny Passage Marine Park

Shoreline Habitat	Length in park (km)*	% of park length
Boulder beach	3	1%
Bedrock platform	82	20%
Cliffs	131	33%
Coarse sandy beach	88	22%
Fine sandy beach	59	15%
Mudflats and sandflats	1	<1%
Sand dunes	<1	<1%
Saltmarsh	36	9%

* habitat lengths have been rounded to the nearest whole number

Coffin Bay, the largest estuary on Eyre Peninsula, is a Wetland of National Importance and is the only northwest orientated estuary in South Australia. Within the shallow, sheltered waters of Coffin Bay, habitats include seagrass meadows (predominantly *Posidonia* spp.), rocky shores and reefs, low energy beaches and dune systems, tidal flats and saltmarshes.

Along the exposed coastline between Point Whidbey (Coffin Bay National Park) and Cape Catastrophe (Lincoln National Park), habitats include pocket beaches, surf beaches exposed to the Southern Ocean, rugged, granite headlands, deep, rocky coves, and calcarenite cliffs. In some places, weathering of the coastal rocks has produced blowholes, crevasses and caves.

[1] 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).

[2] 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)

Rugged headlands and steep cliffs dominate the south-eastern coastline from Wanna to Cape Catastrophe, while a large sandy beach and unconsolidated dune field stretches from Sleaford Mere to Wanna. Wave-cut shore platforms, fringing reefs and deep offshore reefs also occur in the region.

Within the Thorny Passage area the wide range of physical environments (resulting from varied aspect and exposures) have led to the existence of varied and unusual sub-tidal benthic habitats. These range from rugged exposed reef habitats dominated by macroalgal communities (eg off Williams Island and Cape Catastrophe) to sheltered seagrass habitats (eg Memory cove). High tidal currents between islands and the mainland at the entrance of the gulf have given rise to diverse communities of sponges and other invertebrates on hard bottom and unique sand dune fields (often with heights of 5 m or more). This high habitat diversity results in high abundance of fish and high productivity.

A number of offshore islands including Greenly, Rocky and the Four Hummocks group are included in the marine park. Generally islands in the area are fringed by reef or bedrock platforms, however a large proportion of their shorelines and adjacent seafloor habitats are unsurveyed.

1.4 Marine species

The many habitats located within the Thorny Passage 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 Thorny Passage Marine Park features:

- the uncommon deep velvetfish, usually found in tropical waters;
- an important pathway and aggregation area for the *endangered* southern right whale at Sleaford Bay;
- an important breeding area for abalone;
- the nudibranch (sea slug) *Sclerodoris trenberthi*, only found from Elliston to Tumby Bay;
- the unusual and relatively rare velvet octopus *Grimpella thaumastochei*.

1.4.1 Plants and algae

Large brown macroalgae species such as *Cystophora* and the large brown kelp *Ecklonia* dominate the near-shore reef areas of the southern Eyre coastline. There are many other species of brown algae found on most of the reefs throughout the region. These reefs also have a mixed understorey of green, red and coralline algae. Patches of an unusual green algae (*Palmoclathrus stipitatus*) usually associated with deep water, are found in Avoid Bay. Brown algae can also be found on sand or mudflats in Coffin Bay.

1.4.2 Bony fish, sharks and rays

Coffin Bay is a regionally important nursery and feeding area for a wide range of fish species, including many targeted by commercial and recreational fishers, these include King George whiting, sand flathead, yellow-eye mullet, Australian salmon, garfish, Australian herring (tommy ruff), snapper and trevally. Outside of the bay species such as sardine, anchovies, southern bluefin tuna and some shark species are commercially caught. Another species of interest, snook, is also found in the region.

Fish species of conservation concern include, for example, the deep velvetfish, a species of tropical origin which is uncommon in South Australia. The western blue groper, also identified as being of conservation concern, inhabits many of the reefs in the park, and has been identified as a long-living, site attached species, which are particularly vulnerable to fishing pressure.

The nationally *vulnerable* white shark is an important top predator in the southern Eyre Peninsula, preying on tuna and other predatory fish, seals and sea lions, dolphins and seabirds. The shortfin mako and porbeagle sharks visit locations throughout the park and were recently listed for protection under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). Other shark and ray species of conservation concern recorded in the area include the coastal stingaree, whitespotted spurdog, spotted wobbygong, bronze whaler, blue shark, smooth

hammerhead, school shark and dusky whaler, which have all been nominated for protection under the EPBC Act. Seasonal aggregations of fiddler and eagle rays occur in Kellidie Bay.

Sheltered coastal seagrass habitats such as those around Coffin Bay provide habitat for many *Sygnathidae* species such as the leafy and weedy seadragon and several pipefish species, which are all protected in the State.

1.4.3 Marine mammals

Thirteen whale species are known to occur in the region including nationally *endangered* and state *vulnerable* southern right whales, nationally *vulnerable* humpback whales and minke whales, which appear seasonally; bottlenose and common dolphins, and possibly pygmy right whales occur year round; and species like southern bottlenose whale, strap-toothed whale, long-finned pilot whale, sperm whale and pygmy sperm whale have been recorded from strandings and other isolated records. Killer whales have been recorded off the southern coast. All cetacean species are nationally protected.

Liguanea, Smith, Price and Lewis Islands provide important breeding and haul-out sites for the nationally and state listed *vulnerable* Australian sea lion. Liguanea Island hosts a nationally significant breeding and haul-out site for New Zealand fur seals and a colony also exists on Greenly Island. Sleaford Bay is an important pathway and aggregation area for the southern right whale.

1.4.4 Seabirds and local and migratory shorebirds

Located throughout the marine park are many important sites for local and migratory shorebirds, as well as seabirds. Of particular importance is Coffin Bay, with its shallow water and sandy shores providing food for local and migratory shorebirds, such as the state *rare* sanderling, nationally protected grey plover and state *rare* sooty and pied oystercatchers. About 10% of the bird species recorded in the Coffin Bay area frequent off-shore and/or oceanic waters, while a further 15% are wading species. Many of the migratory shorebirds are recognised as internationally significant and are listed under international conservation treaties.

Williams Island hosts breeding pairs of the state *endangered* white-bellied sea eagle and nesting pairs of the state *rare* Cape Barren goose. Coffin Bay and Lincoln National Parks are significant breeding sites for white-bellied sea eagle and osprey which breed on the coastal cliff habitats and rocky offshore islands. The nationally protected little penguin and many internationally protected shearwater species occur in the area, for example Coffin Bay, Avoid Bay Islands, Whidbey Islands Four Hummocks, Greenly Island, Liguanea Island and Williams Island.

The islands of Whidbey, Avoid Bay and Mount Dutton Bay Conservation Park support breeding populations of seabirds including little penguins, white-faced storm petrels, black-faced cormorants, fairy terns, Caspian terns, crested terns, silver gulls and Pacific gulls. A large colony of pied cormorants has also been recorded in the Coffin Bay area.

Wader birds in the area include little terns, pied oystercatchers, red-capped plover, sooty oystercatcher, common greenshank, sanderling, grey plover, eastern reef egret, hooded plover, red-necked stint and curlew sandpiper.

1.4.5 Marine invertebrates

The Thorny Passage marine park region is important for cowries and other specimen shells with at least a dozen known species, most of which are rare or of conservation concern. Uncommon species found in the area include the nudibranch (sea slug) *Sclerodoris trenberthi* , the ghost shrimp (*Neocalliichirus angelikae*) and the velvet octopus (*Grimpella thaumastochei*). There is also a wide diversity of sponge and sea squirt species found on many of the reefs in the park.

Cape Carnot, Cape Wiles and Fishery Bay are thought to be regionally important breeding areas for abalone. Reef habitats within Coffin Bay are often dominated by mussels and oysters rather than the more common reef structure of kelp and other brown algae species. The bay and seagrass beds are an important nursery habitat for crustaceans such as western king prawn, sand crabs, mud cockles and scallop. The unusual bivalve known as the watering-pot shell (*Clavagella*

spp.) is found in parts of Thorny Passage near Little and Lewis Islands. Sand crabs are particularly abundant in Coffin Bay, compared to other areas around South Australia. Coffin Bay Peninsula, Whidbey Isles and Cape Carnot are important habitats for rock lobsters. Octopus species also use the habitats of Coffin Bay and are abundant in the area.

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 Thorny Passage 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), 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.

Coffin Bay is the largest oyster growing area in South Australia. The Coffin Bay aquaculture zone policy includes zones at Kellidie Bay, Frenchman Bluff, Mount Dutton Bay, Point Longnose and Port Douglas (Central, West and East). Oysters are the main species farmed in Coffin Bay, but abalone are also farmed in this area. 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 Thorny Passage Marine Park are:

- Western Zone Abalone Fishery;
- Northern Zone Rock Lobster Fishery;
- West Coast Prawn Fishery;
- Sardine Fishery;
- Marine Scalefish Fishery; and
- Miscellaneous Fishery (Urchin).

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 Thorny Passage 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 (Eyre)	30	20.3	90	102
Abalone (Western Zone)	19.6			
Northern Zone Rock Lobster(Eyre)	19.3	14.5	155	77
Prawn (Spencer Gulf & West Coast)	30.8	71.2	185	342
Sardines (Eyre)	17.5	9.7	48	50
Marine Scalefish (Spencer Gulf/Coffin Bay)	10.9	10.0	249	51
Cockles (mud cockles)^	1.4^			

EconSearch 2010 b, c, d, e and f.
^Cockle (mud cockle) figures are for the whole state

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 Western Zone Abalone Fishery, which produced about 64% of the State's abalone 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.

The West Coast Prawn Fishery encompasses regions off Ceduna, Anxious Bay and Coffin Bay and has 3 license holders. In 2008/09, the west coast fishery contributed about 4.3% of the State's king prawn production, valued at almost $1.26m. In 2009, the Coffin Bay area contributed about 7% of the west coast catch.

The South Australian fishery for Australian sardine is the largest fishery by volume in Australia and is based out of Port Lincoln. Vessels also utilise other ports such as Coffin Bay. Important waters include lower Eyre Peninsula and lower Spencer Gulf. 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. It also includes the cockle (mud cockle) fishery for which quotas have now been introduced to better manage the fishery and protect the species from over-exploitation.

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

For further information 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 for giant petroleum accumulations 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 in the region.

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.

Regional magnetic and gravity data show that prospective rock units, particularly of the Gawler Craton, continue offshore in large areas of some parks. Prospectivity for minerals that could be dredged or remotely mined from the seabed is unknown. Exploration for basement rock targets, below the seabed, is likely to be limited to shallower water areas.

No mineral, petroleum or geothermal licences or leases are currently located within this marine park. A mineral Exploration Licence Application is located inshore from the coast near Sleaford Mere.

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; boat ramps for launching of recreational or commercial vessels; jetties for fishing; and, breakwaters and groynes for coastal management. A wind farm is located at Cathedral Rocks.

2.5 Local tourism

Tourism is the Eyre Peninsula's third largest industry. The coastal and marine environment is integral to the tourism experience throughout this region. In 2007 the lower Eyre Peninsula region attracted an estimated 51,000 day visitors and 32,000 overnight visitors who stayed more than 122,000 nights in the area. The average stay was 4 nights.

Visitors are drawn to the protected waterways of Coffin Bay and the exposed, rugged coastline of the Coffin Bay and Jussieu Peninsulas. During the summer months and Easter, the population of Coffin Bay is known to increase from 650 to nearly 4,000 people. Tourism drawcards include the use of charter boats for fishing, diving, recreational fishing, boating, water sports, four wheel driving, whale watching and other nature-based experiences such as visiting national parks.

Tourism provides an important employment opportunity for people in the lower Eyre Peninsula with at least 63 local businesses involved in or reliant on tourism.

The Seafood and Aquaculture Trail is also a popular tourist activity. The Seafood and Aquaculture trail showcases seafood, aquaculture and dining experiences of the region and occurs in many of the towns along the Eyre Peninsula coast. It gives the public an opportunity to view the industry first hand from production to the plate. In Coffin Bay people have the chance to experience a working oyster farm and learn the history of the industry while spotting dolphins, seals and birdlife along the way.

3 SOCIAL VALUES

The marine environment is an important recreational and cultural asset for coastal communities. Marine parks will be designed to accommodate existing recreational activities wherever possible. This section highlights the social values of Thorny Passage 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 Thorny Passage Marine Park.

3.1.1 Language groups

The Nauo and Barngarla Aboriginal people have traditional associations with areas of the marine park including estuarine and coastal environments which provide food and resources for local Aboriginal people and still hold strong cultural significance today.

3.1.2 Agreements and Claims

There are two Native Title claims which include areas of the marine park; these are the Barngala Native Title Claim (1996) and the Nauo-Barngala Native Title Claim (1997).

3.1.3 Sites and stories

Some local places are described in the story of Pulyallana, a legendary character responsible for creating many of the prominent land marks, including caves, rocks, boulders and islands around the park and surrounding area.

3.1.4 Protected areas

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 Thorny Passage Marine Park will recognise and complement sites of cultural and maritime heritage.

Cape Catastrophe and Memory Cove at the eastern end of this park were aptly named by Matthew Flinders to mark the loss of eight of his crew in this area in February 1802. Flinders left a small tablet at Memory Cove to commemorate the event and the significance of this site is recognised by its inclusion in the State Heritage Register and Register of the National Estate.

Whaling was an important early industry in the area. The whaling station at Fishery Bay contains the most extensive relics and remains of whaling in South Australia. This and the Coffin Bay whaling station site at Point Sir Isaac are both included in the State Heritage Register for their historical and archaeological significance.

The history of the maritime and fishing industries is represented by the jetties at Mount Dutton Bay (State Heritage Register) and Coffin Bay and by the site of Oyster Town on the shores of Coffin Bay. Numerous shipwrecks, mostly fishing vessels, are scattered throughout the park and include the protected wrecks of the *Amelia* (1883), *Alternative* (1884), *Caprice* (1928) and the *Mary Ellis* (1907) which was driven ashore in a gale at what is now locally known as Wreck Beach.

Several sections of the coastline are listed as geological monuments, including Cape Carnot which contains some of the oldest known rocks in South Australia. The Cape is the most easterly outcrop of Archaean (2400 million years bp) rock in Australia and forms a spectacular landscape feature. Conservation parks in Coffin Bay and the offshore islands to the west are included in the Register of the National Estate.

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 viewscapes. The significance or quality of viewscapes 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 Thorny Passage Marine Park has high scenic values (Lothian 2005). Within the marine park at the southern tip of Eyre Peninsula is some of South Australia's most spectacular and highly rated coastline, including the high (80-100m+) rugged and steep cliffs at Whalers Way which is the highest ranked area of coastal scenic quality in the State. These cliffs continue westwards to Shoal Point. Of similar scenic value is the section of coast between Cape Tournefort and Cape Catastrophe which includes the high, steep and deeply indented cliffs at West Point.

Separating these two elevated sections of coast is the long sweeping curve of the beach at Sleaford Bay, backed by extensive dune blowouts. Both this and the beach at Fishery Bay have high scenic values.

The lower rocky headlands between Shoal Point and Point Sir Isaac are considered to be of high scenic value. These are interspersed with dunes and beaches which have a more moderate rating, as do the sandy beaches, low rocky headlands and cliffs and patches of wetlands surrounding the protected waters of Coffin, Mount Dutton and Kellidie Bays.

Scenic values of the offshore islands have not been assessed.

Scenic values of coastline in the Thorny Passage Marine Park (Lothian 2005).

Rating	Coastal landform type	Ranking
7.25 – 8.5	High cliffs	High
6.5 – 8.25	Headlands and bays	Moderate - High
6.5 – 7.25	Beaches and Dunes	Moderate - High

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

3.4 Recreational activities in the marine park

The coastal and marine environments of the Thorny Passage Marine Park are very popular with recreational fishers, boat users, snorkellers, scuba divers, swimmers, surfers and sightseers. Examples of these activities are provided 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 the West Coast and Southern Spencer Gulf (region 5 & 6) during 07/08 was 12,764 which amounted to 43,378 days of fishing. (Note figures relate to regions used for reporting fishing activities and include catches from outside the marine park boundary). King George whiting, snapper, southern garfish, southern calamari and blue swimmer crab were the most frequently caught species for this region.

Recreational beach fishing is popular at Frenchmans Bluff, Farm Beach, Seven Mile Beach, Black Springs, Sensation Beach, Almonta Beach, Gunyah Beach, Salmon Hole, Miller Hole and at Seal Corner at the mouth of Mount Dutton Bay. There are also several jetties located in the park including Coffin Bay and Mt Dutton Bay.

Recreational fishing from boats occurs at many sites throughout the region, including around Greenly Island and in Coffin Bay from Kellidie Bay to outside Farm Beach, with access via boat ramps or beach access throughout the park. A formal boat ramp is located at Coffin Bay while beach launching occurs from Farm Beach and other places. There are mooring facilities in Coffin Bay.

3.4.2 Popular surfing and swimming beaches

Popular swimming sites include the waters near the township of Coffin Bay, Farm Beach, Seven Mile Beach and Fishery Bay. Popular surfing sites include Mullalong beach, Fishery Bay, Wreck beach and Sleaford Bay.

3.4.3 Popular diving locations

The bays and coastline around Coffin Bay, Coffin Bay National Park and Lincoln National Park are popular diving locations.

3.4.4 Other recreational activities in the park

Caravan and or camping facilities are located at Coffin Bay, Coffin Bay National Park and Lincoln National Park. Beachcombing, fossicking, walking and bird watching are also popular in the area.

3.5 Interpretive and educational facilities within the marine park

Coffin Bay National Park and Lincoln National Park, which are adjacent to or partially overlayed by the marine park, are popular tourist destinations. They both include numerous walking trails and existing interpretive signage and other infrastructure. The Sleaford Bay coastline is also popular for whale watching. Whalers Way adjacent to Fishery Bay, is a popular driving and interpretive trail, the area contains remnants of an old whaling station.

Marine and environmental education programs are the focus of many schools in the region.

APPENDIX 1 SPECIES LIST

This list of some of the species identified in the Thorny Passage Marine Park indicates the diversity of species found there.

Plants and algae

coralline algae	Corallinaceae
kelp	*Ecklonia radiata*
large brown kelp	*Ecklonia radiata*

Bony fish, sharks and rays

anchovies	*Engraulis australis*
Australian herring	*Arripis georgianus*
Australian salmon	*Arripis truttaceus*
Australian sardine	*Sardinops neopilchardus*
black ray	*Dasyatis thetidis*
blue shark	*Prionace glauca*
bronze whaler	*Carcharhinus brachyurus*
coastal stingaree	*Urolophus orarius*
crested pipefish	*Histiogamphelus cristatus*
deep velvetfish	*Kanekonia queenslandica*
dusky whaler	*Carcharhinus obscurus*
eagle ray	*Myliobatis australis*
fiddler ray	*Trygonorrhina fasciata*
flathead	*Platycephalus bassensis*
garfish	*Hyporhamphus melanochir*
King George whiting	*Sillaginodes punctata*
leafy seadragon	*Phycodurus equus*
pipefish	Signathidae
porbeagle	*Lamna nasus*
sardine	*Sardinops neopilchardus*
school shark	*Galeorhinus galeus*
shortfin mako	*Isurus oxyrinchus*
smooth hammerhead	*Sphyrna zygaena*
snapper	*Pagrus auratus*
snook	*Sphyraena novaehollandiae*
southern bluefin tuna	*Thunnus maccoyi*
southern garfish	*Hyporhamphus melanochir*
spotted wobbygong	*Orectolobus maculatus*
trevally	*Pseudocaranx georgianus*
weedy seadragon	*Phyllopteryx taeniolatus*
western blue groper	*Achoerodus gouldii*
white shark	*Carcharhinus brachyurus*
whitespotted spurdog	*Squalus acanthias*
yellow-eye mullet	*Aldrichetta forsteri*
yellow-tail kingfish	*Seriola lalandi*

Marine mammals

Australian sea lion	*Neophoca cinerea*
bottlenose dolphin	*Tursiops truncatus*
common dolphin	*Delphinus delphis*
humpback whale	*Megaptera novaeangliae*
killer whale	*Orcinus orca*
long-finned pilot whale	*Globicephala melas*
minke whale	*Balaenoptera acutorostrata*
New Zealand fur seal	*Arctocephalus forsteri*
pygmy right whale	*Caperea marginata*

pygmy sperm whale	*Kogia breviceps*
southern bottlenose whale	*Hyperoodon planifrons*
southern right whale	*Eubalaena australis*
sperm whale	*Physeter catodon*
strap-toothed whale	*Mesoplodon layardii*

Seabirds and local and migratory shorebirds

black-faced cormorant	*Phalacrocorax fuscescens*
Cape Barren goose	*Cereopsis novaehollandiae*
Caspian tern	*Sterna caspia*
common greenshank	*Tringa nebularia*
crested tern	*Sterna bergii*
curlew sandpiper	*Calidris ferruginea*
eastern reef egret	*Egretta sacra*
fairy tern	*Sterna nereis*
grey plover	*Pluvialis squatarola*
hooded plover	*Thinornis rubricollis*
little penguin	*Eudyptula minor*
little tern	*Sterna albifrons*
osprey	*Pandion haliaetus*
Pacific gull	*Larus pacificus*
pied cormorant	*Phalacrocorax varius*
pied oystercatcher	*Haematopus longirostris*
red-capped plover	*Charadrius ruficapillus*
red-necked stint	*Calidris ruficollis*
sanderling	*Calidris alba*
silver gull	*Larus novaehollandiae*
sooty oystercatcher	*Haematopus fuliginosus*
white-bellied sea eagle	*Fregetta grallaria grallaria*
white-faced storm petrel	*Pelagodroma marina*

Marine invertebrates

blacklip abalone	*Haliotis rubra*
cowrie	Cypraeidae
greenlip abalone	*Haliotis laevigata*
king prawn	*Melicertus latisulcatus*
King scallop	*Pecten fumatus*
mud cockle	*Katelysia* spp
mussel	Mytilidae
nudibranch	Nudibranchia
oyster	*Crassostrea gigas*
Pacific oysters	*Crassostrea gigas*
rock lobster	*Jasus edwardsii*
sand crab	*Ovalipes australiensis*
scallop	Pectinidae
southern calamari	*Sepioteuthis australis*
southern rock lobster	*Jasus edwardsii*
velvet octopus	*Grimpella thaumastocheir*
western king prawn	*Melicertus latisulcatus*
sponge	Porifera

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