
Marine Parks

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Environmental, Economic and Social Values of the Investigator Marine Park

PART 1



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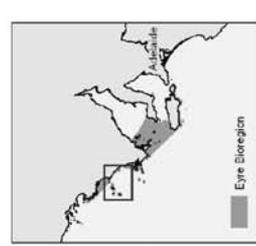
PART 2 AN ATLAS OF MAPS

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>.

Investigator Marine Park



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



Produced by
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Data Source
 Bathymetry, Topographic Data - DEH
 Marine Bioregions - SARDI
 Main Waters Jurisdiction - Geoscience Australia
 Geospatial
 Geospatial Datum of Australia, 1984

Completed
 2010

Projection
 Geospatial Datum of Australia, 1984

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DEH MapID: 2010-3229

Investigator Marine Park

Located on the west coast of Eyre Peninsula in the Eyre Bioregion, the Investigator Marine Park covers 1,185 km² over four areas, including the area south of Elliston to near Point Drummond and the offshore islands of the Investigator Group Conservation Park. The Cap Island Conservation Park is also included in the boundaries of this marine 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	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	x
Cliffs	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	x	x

The Investigator Marine Park will be designed to conserve examples of the variety 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 the region include:

- sea surface temperatures ranging from 12°C in winter to 22°C in summer;
- the warmer Leeuwin Current¹;
- the cooler Flinders Current²;
- seasonal nutrient-rich upwellings.

1.3 Habitat variety

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

Benthic Habitat**	Area (km ²)*	% of park
Bare sand	2	<1%
Granite reef	8	1%
Heavy limestone reef	70	6%
Unmapped	1110	93%

* 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 Investigator Marine Park

Shoreline Habitat	Length in park (km)*	% of park length
Bedrock platform	3	3%
Cliffs	67	80%
Coarse sandy beach	7	8%
Fine sandy beach	7	9%

* habitat lengths have been rounded to the nearest whole number

1.3.1 Offshore Islands

The Investigator Group of islands provides unusual examples of island mountains (inselbergs) that rise steeply from deep water. The Investigator Group takes the form of imposing wedges and domes (peaking at 238m above sea level), littered with boulders and skirted by massive jointed plates.

The shoreline of Flinders Island is a combination of sheltered rocky shores, cliffs and sandy beach on the eastern side, and exposed sandy beaches on the western side. The western exposed shores of Pearson Island have tall cliffs, deep bays, chasms and crevasses. The eastern side is more sheltered and less steep. Ward Island is a small dome descending to rock piles and submerged shelves at sea level. Sheer undercut cliffs have formed from the erosion of the calcarenite. There are calcareous blocks and rubble reef around Topgallant island. The shores of Topgallant are steep, and there are sheer walls of eroding rock at some coastal points around the island. On the sheltered side of Topgallant almost vertical underwater cliffs drop steeply to more than 30m, providing a high diversity of micro habitats. On the exposed side the island is characterised by extensive shallow habitat comprising many bommies and valleys between them.

Seagrass beds at Pearson, Flinders and Top Gallant Islands are the only significant examples of this habitat type for many kilometres. All the islands have steeply sloping shores down to 50m with high diversity of benthic algae and animals and high productivity. Being regionally isolated, they are particularly significant to the fish and other animals they support.

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)

1.3.2 Elliston to Point Drummond

On the mainland, the coastal strip is mostly comprised of calcarenite cliffs averaging between 40 and 50 metres high. The cliffs are broken by high energy surf beaches such as Sheringa beach. Surf beaches in this area are an unusual habitat type as they are comprised of fine sediments, which usually support a higher diversity of invertebrate animals living within the sands. This is unusual as surf beaches generally consist of coarse sediments due to high wave energy.

1.4 Marine species

The many habitats located within the Investigator Marine Park support a variety of marine and coastal species including fish, sharks, mammals, birds and invertebrates, some of which have been identified as ecologically important. to Appendix 1 for a more detailed list of species. The Investigator Marine Park features:

- The golden roughy, a light-emitting fish which has only been recorded in this marine park;
- A nursery area for the western blue groper, a species of conservation concern;
- More than 100 species of red algae have been recorded around Ward Island;
- The small, golden-red, spotted nudibranch located in waters from Tumby Bay to Elliston.

1.4.1 Plants and algae

The region is known to have a large diversity of macroalgae species. Surrounding Ward Islands, up to 17 species of green macroalgae and more than 100 species of red macroalgae have been recorded. Some of this diversity may be due to the very clear waters, which allow light to reach depths further than in other places. A high number of macroalgal species with limited ranges and/or tropical origins are also found in the area. Many of the reefs are dominated by large brown algae, such as *Ecklonia*, *Cystophora* species and *Sargassum* species. The understory is full of colour with a large variety of green, red and coralline algae. Seagrass is diverse and expansive in the area. *Posidonia* is the dominant species however *Halophila* and *Heterozostera* are also present. The less common *Posidonia coriacea* is also found in the park.

1.4.2 Bony fish, sharks and rays

Unusual species recorded around the Investigator islands include the light-emitting fish known as the golden roughy, which has been recorded within the marine park but nowhere else in Australia. Reefs around Ward and Pearson Islands have also been identified as important for the western blue groper, identified as being of conservation concern. A nursery area for this species is known to occur around Flinders Island. The crested threefin has been recorded in the park and to date, has almost exclusively been found in South Australia. Fish which are usually associated with warmer, more western locations have been recorded in the park, including western footballer, short-finned snake-blenny and the barred threefin.

A variety of pipefish occur in the area, particularly in seagrass beds. The park is known to provide habitat for the uncommon robust pipehorse and the protected weedy seadragon can be found in these waters.

Shark and ray species of conservation concern found in the area include coastal stingaree, whitespotted spurdog, spotted wobbegong, bronze whaler, blue shark, dusky whaler, smooth hammerhead and school shark as well as the shortfin mako and porbeagle which 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. These waters are also well known as preferred habitat for the nationally *vulnerable* white shark.

1.4.3 Marine mammals

Ward, Pearson and Dorothee Islands provide breeding sites for the nationally and state listed *vulnerable* Australian sea lion, while Veteran, Pearson, Topgallant and Cap Islands provide haul-out sites. New Zealand fur seals breed and haul-out on Ward and Dorothee Islands and use the rock platforms at South Veteran and Pearson Islands for haul-out sites.

1.4.4 Seabirds and local and migratory shorebirds

Numerous seabirds of conservation concern use the islands of the Investigator Group for breeding and/or roosting. These species include colonies of little penguins, state *endangered* white-bellied sea eagle, state *endangered* osprey, state *rare* eastern reef egret, state *rare* rock parrot and state *rare* Cape Barren goose. The protected white-faced storm petrel and short-tailed shearwater, protected under international conservation treaties, are also located on Ward Island. The red-tailed tropic bird, a tropical sea bird species, is rarely recorded in South Australia has been recorded from Pearson and Flinders Island. The state *vulnerable* hooded plover and state *endangered* fairy tern can be found on Pearson Island.

1.4.5 Marine invertebrates

Reefs such as those at Flinders Island are particularly rich in their diversity of invertebrate animals, which are less able to resist physical disturbances. The Top Gallant Isles area is considered to have a very high species diversity of ascidians (sea squirts). A number of ascidian species have been recorded at the Investigator Islands that have not been reported elsewhere. Invertebrates with tropical origins such as *Stolonica vesicularis* have been found around Ward Island.

Other uncommon species include various nudibranch (sea slug) species, such as the small, golden-red, spotted nudibranch known from Tumbay Bay to Elliston, while hard corals, such as *Plesiastrea versipora* are also found in the Investigator Group Islands.

Greenlip and blacklip abalone, as well as rock lobster are found around Ward Island and along the coast. Other species such as southern calamari, giant cuttlefish, Maori octopus, purple sea urchin and sand crabs use various habitats for different stages of their life cycle. The giant Australian cuttlefish is currently nominated for protection under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act).

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 Investigator Marine Park are summarised below. Information in the Commercial Fishing, and Mineral and energy resources sections have been provided by PIRSA.

2.1 Commercial fishing

The commercial fisheries that operate in the Investigator Marine Park are:

- Western Zone Abalone Fishery;
- Northern Zone Rock Lobster Fishery; and
- Marine Scalefish 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 Investigator 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
Abalone (Eyre)	30	20.3	90	102
Abalone (Western Zone)	19.6			
Northern Zone Rock Lobster (Eyre)	19.3	14.5	155	77
Marine Scalefish (West Coast Region)	3.2	2.4	40	13

EconSearch 2010 a, b, and c.

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 is located in 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 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 from a number of locations throughout 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

2.2 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, although potential exists to utilise geothermal energy in adjacent coastal or inland water settings 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.

A mineral Exploration Licence covers all of Flinders Island which is surrounded by the park (Orogenic Exploration). A mineral Exploration Licence Application surrounds all of Flinders Is.

2.3 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. Sheringa Beach and Loch Well Beach have been proposed for future wind farm sites.

2.4 Local tourism

Tourism is an economic contributor to the region, with the coastal environment, fishing and boating the major attractions. Charter vessels based in a variety of ports offer recreational fishing and diving experiences around the islands.

The Elliston District Council area attracted an average of 24,000 overnight visitors annually who stayed an average of four nights each.

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 the Investigator 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 Investigator Marine Park.

3.1.1 *Language Groups*

The Wirangu and Nauo-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*

Parts of the Nauo-Barngala Native Title Claim (1997) are included in areas of the Investigator 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 Investigator Marine Park will recognise and complement sites of cultural and maritime heritage.

Matthew Flinders charted and named this group of islands after his vessel *Investigator*, in February 1802. Within a few decades of Flinders' visit the area was being visited by British, French and American whalers. There is also a history of seal hunting on the islands. The archaeological remains of an early bay whaling station located on the eastern side of Flinders Island are included in the State Heritage Register. A camp built by survivors of the wrecking of the whaling vessel *Vulcan* in 1845 has been found not far from the whaling station. The wreck itself (which is protected) has not been found.

Flinders Island was used from the early years for pastoral or agricultural purposes and buildings and structures associated with these remain on the island. Guano was also mined on several parts of the island including the caves on the eastern side, where a crumbling stack of bagged guano remains on the shoreline.

Lighthouses were built on Flinders and Pearson Islands from 1914, but did not prevent vessels like the *Kapara* (1942) and the *Maddalena II* (1992) being wrecked or stranded on the rocky shores of the island. Other wrecks in the area are associated with fishing or the activities of the farmers on Flinders Island.

Cap Island Conservation Park, the Investigator Group Conservation Park and Drummond Point are listed on the Register of the National Estate. Drummond Point is recognised for its geological significance and is also listed as a geological monument.

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 viewscales. The significance or quality of viewscales 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 Investigator Group Marine Park has high scenic values and is part of the longest section of spectacular coastal landscapes in South Australia (Lothian 2005). The mainland coastline of this marine park consists of an almost continuous line of high (40-80m) and sheer cliffs, broken only by shorter sections of beaches (Kiana, Sheringa and Loch Well), backed either by dunes or cliffs.

Scenic values of the offshore islands have not been assessed.

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

Rating	Coastal landform type	Ranking
7.5 – 8.0	High cliffs	High
7.5 – 8.0	Headlands and bays	High
6.75 – 7.25	Dunes and beaches	Moderate

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

3.4 Recreational activities in the marine park

The coastal and marine environments of the Investigator Marine Park are very popular with recreational fishers, boat users, surfers and sightseers. Those activities that are known to occur in this marine park are 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 the west coast (region 4) during 07/08 was 3,241 which amounted to 7,172 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, southern garfish, southern calamari and blue swimmer crab were the most frequently caught species for this region.

Recreational fishing is popular at Sheringa beach, Drummond Point and Loch Well beach and on Flinders Island.

Private and charter vessels access Flinders, Ward and Pearson Islands for offshore recreational fishing.

3.4.2 Popular surfing and swimming beaches

The mainland stretch of the Investigator Marine Park is particularly popular with surfers who target beaches including Sheringa beach.

3.4.3 Popular diving locations

Drummond Point, Pearson Island, The Dice and Topgallant Island are visited by divers for their numerous caves and tunnels formed by boulders as well as the abundant marine life.

3.4.4 Other recreational activities in the park

Camping is popular at Sheringa beach.

3.5 Interpretive and educational locations within the marine park

A lookout and stair access is installed at Loch Well beach.

nudibranch
purple sea urchin
sand crab
southern calamari
southern rock lobster

Nudibranchia
Heliocidaris erythrogramma
Ovalipes australiensis
Sepioteuthis australis
Jasus edwardsii

REFERENCES AND SUGGESTED FURTHER READING

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