

Thorny Passage Marine Park

Preliminary sanctuary zone scenario

Starting point for Marine Park Local Advisory Group discussion

South Australians enjoy the benefits of a healthy marine environment. However, the marine environment is under increasing pressure from a range of sources, including climate change, run-off and competition for resources, which could affect how we use and enjoy it in the future.

Marine parks are currently being set up around Australia as part of a national and international response to these increasing pressures.

In 2009, the South Australian Government declared a network of 19 marine parks to help protect and conserve areas of natural value within our State's waters for generations to come.

Your assistance is now needed to help develop the zoning and management plans for these marine parks.

At this meeting, you will begin the process of developing a proposed zoning scenario for your local marine park(s). You will be provided a range of information about zoning, including a preliminary sanctuary zone scenario developed by DENR, and other government agencies to provide a starting point for discussions by your MPLAG about how marine parks might be zoned for conservation, commerce and community use.

The preliminary sanctuary zone scenario is only a starting point and does not represent a Government proposal or preference. There may be better ways to design a marine park zoning scheme to achieve the desired outcomes. Your MPLAG's advice on its preferred zoning scenario(s) is sought.

The preliminary sanctuary zone scenarios have been developed using the environmental, social and economic information currently available to Government, including the information provided through SAMPIT (the South Australian Marine Parks Information Tool).

The next step is for the scenarios to be worked on over the next six months by the MPLAGs and key stakeholders, such as the seafood industry, tourism operators, local government and conservation interests, who all have important information to bring to the table.

It is expected that this work will result in changes to what is initially provided. Indeed, this is the purpose of MPLAGs and key stakeholder engagement - to better inform and assist the Government in this process - so we can help ensure that the needs of local communities and industries are met.

The State Government has not adopted an arbitrary percentage target for the size of sanctuary zones. Instead, it remains open to the advice of the community as to how to best design the marine parks network to protect and conserve marine biodiversity and marine habitats in a manner that accords with the objects of the *Marine Parks Act 2007*.

To assist MPLAGs, key stakeholders and other community members to develop their preferred zoning scenario(s), you will be provided with some indicative zoning guidelines.

These guidelines have been developed with due regard to advice from the Marine Parks Scientific Working Group and Marine Parks Council of South Australia, which provide independent advice on marine park matters.

One of these zoning guidelines is that sanctuary zones should cover about 20-25% of each marine park - this would translate to about 10% of our State's waters.

However, this is a guideline only and may not be achievable in some marine parks, particularly where there are significant policy commitments in place to provide for various current and future activities.

Your attention is drawn to the marine park policy commitments made by the Government in 2009, in particular the assurance given to the commercial fishing industry that the outcome of marine parks zoning will have no more than a 5% economic impact (as per the 2007 EconSearch report).

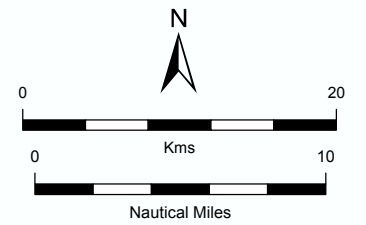
In developing your preferred zoning scenarios it will be important that you apply the full zoning checklists and policy commitments, to help ensure your suggestions meet the marine park design requirements. Doing this will help you develop a proposal for your park(s) that is good for conservation and good for commercial and community interests.

For more information, please contact your MPLAG Executive Officer via email at DENRmarine@sa.gov.au, or phone the Coast and Marine Conservation Branch, Department of Environment and Natural Resources, on Freecall 1800 006 120.

Marine Park 5 Thorny Passage Marine Park

Preliminary Sanctuary Zone Scenario Starting Point Version 1

- Possible Sanctuary Zones
- Marine Parks
- Lake - Perennial
- Lake - Intermittent
- Lake - Mainly Dry
- Land Subject to Inundation (STI)
- Parks and Reserves
- Special Purpose Areas (Harbours)
- Bathymetry
- Coastline (median high water)
- Coastal Waters of the State
- Major Road
- Minor Road

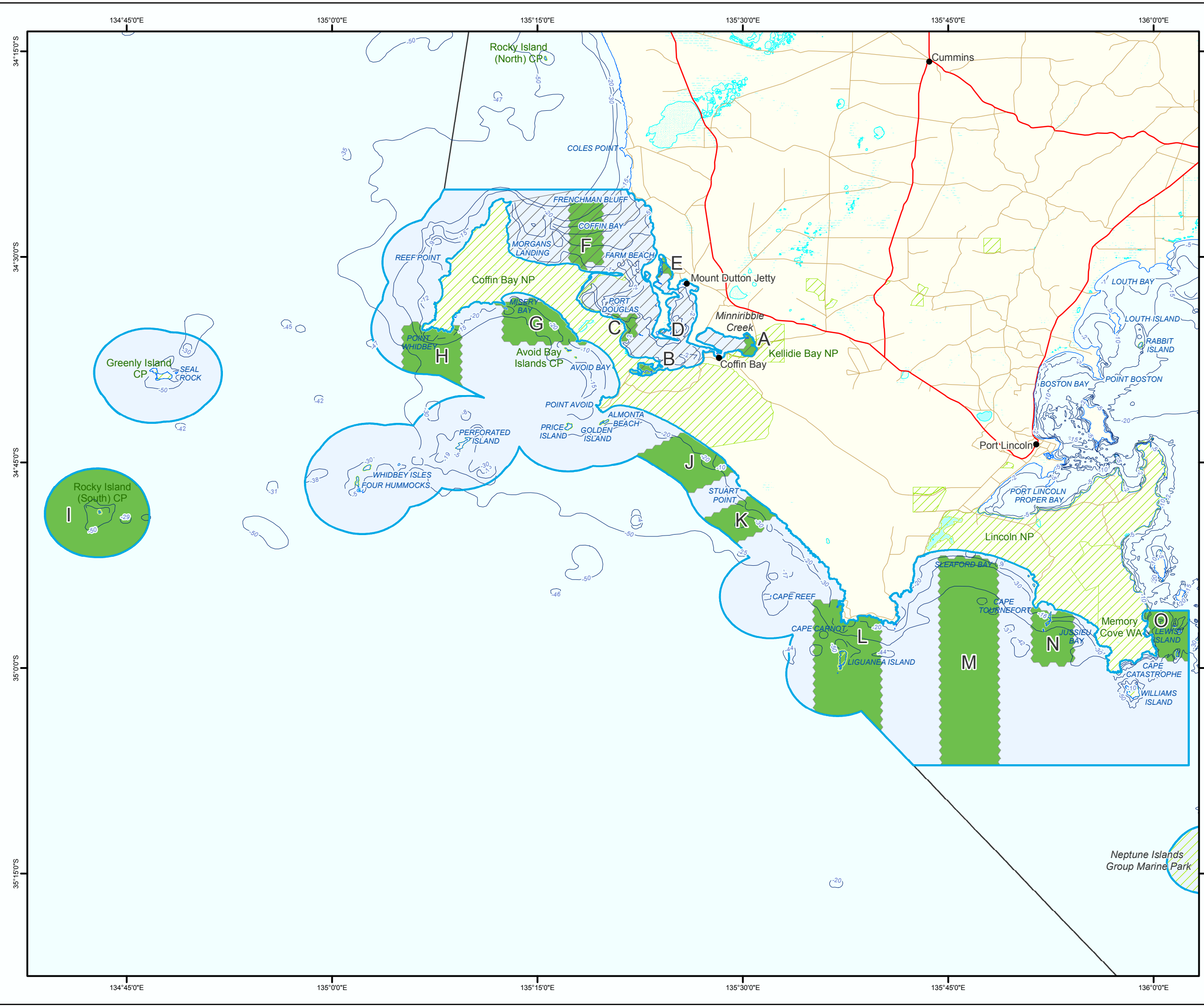


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Department of Environment and Natural Resources
GPO BOX 1047 Adelaide SA 5001
www.marineparks.sa.gov.au

Data Source Marine Parks, Parks and Reserves,
Topographic Data, Boat Ramps, Bathymetry - DENR
Coastal Waters of the State - Geoscience Australia
Harbours - DENR & Harbours and Navigation Act
5 November 2010

Compiled Projection Datum Geographic
Geocentric Datum of Australia, 1994

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Basis for 'Starting Point' Preliminary Sanctuary Zone Scenario – Thorny Passage Marine Park (Park 5)		
Location of possible Sanctuary Zone	Area	Rationale for possible Sanctuary Zone
Zone A: East side of Kellidie Bay	3 km ²	<p>The possible Sanctuary Zone represents the following habitats</p> <ul style="list-style-type: none"> The shorelines represented in this possible Sanctuary Zone are primarily sheltered cliffs and supratidal saltmarsh. Benthic habitats represented in this Zone include low profile rocky reef, a dense and patchy macroalgae community, dense and patchy seagrass communities and soft-bottom habitats. All habitats exist in shallow waters (< 10m). This is an important area of habitat for various species of fish (including whiting, flathead and flounder) sharks (including whaler, gummy) and rays (including eagle and fiddler). Due to the shallow and protected nature of the bays, they experience significant summer/winter sea surface temperature fluctuations (up to 16°). <p>Other important features and natural processes</p> <ul style="list-style-type: none"> The bay experiences significant summer/winter sea surface temperature fluctuations. There is also fresh submarine groundwater discharge from benthic upwellings and seasonal freshwater input from Merintha and Minniribbie creeks. There is anecdotal evidence of higher order predator fish (snapper, kingfish) spawning in Kellidie Bay. Kellidie Bay experiences a summertime hypersaline environment (evaporation exceeds rainfall for at least 6 months of the year) with limited oceanic exchange (estimated > 150 days flushing time). The waters of the Port Douglas system constitute the largest estuarine system on Eyre Peninsula and the second largest in SA. Unvegetated soft bottom and seagrass beds provide spawning, breeding and nursery areas for a wide variety of fish (King George whiting, Australian salmon, tommy ruff, garfish flathead and flounder species) and invertebrates (sand crabs, octopus and scallops), as well as being utilised by common and bottlenose dolphins for feeding, breeding and calving. <p>Social and economic considerations</p> <ul style="list-style-type: none"> This possible Sanctuary Zone avoids heavy recreational fishing effort in the channels at the mouth of Kellidie Bay, and is situated away from aquaculture leases and associated vessel traffic. This Zone provides for boat launching facilities, and the townships of Coffin Bay and Kellidie Bay, and has easily identified north/south boundaries. This Zone is included in the Coffin Bay Wetlands system, which is registered on the <i>Directory of Important Wetlands</i> and is also listed as a 'High Conservation Value Aquatic Ecosystem'. This Zone is complemented by a netting closure. The Zones in this area have been designed to provide for areas of high activity (boat ramps) and high public access. The Zones in this area provide for aquaculture zones, leases and associated vessel traffic.
Zone B: Yangie Bay	3 km ²	<p>The possible Sanctuary Zone represents the following habitats</p> <ul style="list-style-type: none"> The shoreline classifications in this Zone include sheltered cliff, sheltered coarse sand beach and intertidal samphire. Benthic habitats include low profile rocky reef, soft-bottom habitats, silt, medium to low profile bedrock platform reef, dense and medium seagrass community and dense and sparse macroalgae community, all of which exist in relatively shallow waters (< 10m). The bathymetry of this Zone includes a channel, sub-channel, basin and tidal sandbanks associated within an estuarine system, as well as the presence of an inshore island. <p>Other important features and natural processes</p> <ul style="list-style-type: none"> The waters of the Port Douglas system constitute the largest estuarine system on Eyre Peninsula and the second largest in SA. Yangie Bay is a very important breeding, spawning and nursery area for a wide variety of fish and invertebrates, as well as being utilised by common and bottlenose dolphins for feeding, breeding and calving. This bay system experiences regular tidal inundation and flushing. This Zone contains a nursery area for macro-invertebrates such as the western king prawn, sand crabs, mud cockles, octopus and scallop species, as well as periodic habitat for the vulnerable leatherback turtle. This is an important area of habitat for various species of fish (including whiting, flathead and flounder) sharks (including whaler, gummy) and rays (including eagle and fiddler). Due to the shallow and protected nature of the bays, they experience significant summer / winter sea surface temperature fluctuations (up to 16°).

		<p>Social and economic considerations</p> <ul style="list-style-type: none"> • This possible Sanctuary Zone is positioned to provide for heavy recreational fishing effort (source: SAMPIT), and commercial marine scale industry effort. • The boundaries of this Zone (aligned with the mouth) are easily identified. • This Zone is included in the Coffin Bay Wetlands system, which is registered on the <i>Directory of Important Wetlands</i> and is also listed as a 'High Conservation Value Aquatic Ecosystem'. • This Zone is complemented by a netting closure. • The Zones in this area have been designed to provide for areas of high activity (boat ramps) and where possible is complemented by limited public access. • The Zones in this area attempt to provide for aquaculture zones, leases and associated vessel traffic. • This Zone has been designed to provide for marine scale fishing where possible.
Zone C: Eely Point	6 km ²	<p>The possible Sanctuary Zone represents the following habitats</p> <ul style="list-style-type: none"> • Shoreline types represented in this Zone include sheltered cliffs and sheltered coarse sand beach. • Benthic habitats present in this Zone include an area of cobble habitat, (only location in this harbor), with patchy invertebrate and seagrass communities and soft-bottom habitats all in the 0 - 10m depth class. • The bathymetry also includes a tidal channel and sandbanks associated with an estuarine system. <p>Other important features and natural processes</p> <ul style="list-style-type: none"> • The waters of the Port Douglas system constitute the largest estuarine system on Eyre Peninsula and the second largest in SA. • This area experiences frequent and large volume tidal exchange, supporting nutrient and sediment transport. • Due to the shallow and protected nature of the bays, they experience significant summer/winter sea surface temperature fluctuations (up to 16°). • Unvegetated soft bottom and seagrass beds provide spawning, breeding and nursery areas for a wide variety of fish (King George whiting, Australian salmon, tommy ruff, garfish flathead and flounder species) and invertebrates (sand crabs, octopus and scallops), as well as being utilised by common and bottlenose dolphins for feeding, breeding and calving. <p>Social and economic considerations</p> <ul style="list-style-type: none"> • This possible Sanctuary Zone is positioned to provide for heavy recreational fishing effort and fishing effort by charter boat operators at The Brothers as well as commercial mud cockle effort to the south. • This Zone is easily identified by prominent headlands and east/west and north/south boundaries. • This Zone is included in the Coffin Bay Wetlands system, which is registered on the <i>Directory of Important Wetlands</i> and is also listed as a 'High Conservation Value Aquatic Ecosystem'. • This Zone is complemented by a netting closure. • The Zones in this area have been designed to provide for areas of high activity (boat ramps) and high public access. • The Zones in this area provide for aquaculture zones, leases and associated vessel traffic.
Zone D: South east end of Horse Peninsula	1 km ²	<p>The possible Sanctuary Zone represents the following habitats</p> <ul style="list-style-type: none"> • The shoreline in this zone consists predominantly of sheltered cliffs and supratidal saltmarsh, as well as including an inshore Island and associated habitat and ecosystem types. • Benthic habitats include a macroalgae and patchy seagrass community and soft-bottom habitats, all of which exist in a shallow water environment (< 10m). • The possible Sanctuary Zone represents a relatively rare north/south facing bay which is open to the predominant south westerly winds. • The Zone represents significantly deeper waters than the northern end of the bay, which offers differing species associations. <p>Other important features and natural processes</p> <ul style="list-style-type: none"> • The waters of the Port Douglas system constitute the largest estuarine system on Eyre Peninsula and the second largest in SA. • The Zone experiences significant summer/winter sea surface temperature fluctuations (up to 16°). • A nursery area for macro-invertebrates such as the western king prawn, sand crabs, mud cockles, octopus and scallop species, as well as periodic habitat for the vulnerable leatherback turtle. • Due to the shallow and protected nature of the bays, they experience significant summer/winter sea surface temperature fluctuations (up to 16°).

		<ul style="list-style-type: none"> • Unvegetated soft bottom and seagrass beds provide spawning, breeding and nursery areas for a wide variety of fish (King George whiting, Australian salmon, tommy ruff, garfish flathead and flounder species) and invertebrates (sand crabs, octopus and scallops), as well as being utilised by common and bottlenose dolphins for feeding, breeding and calving. <p>Social and economic considerations</p> <ul style="list-style-type: none"> • This possible Sanctuary Zone is positioned to provide for commercial mud cockling effort, recreational fishing effort, areas of high activity (boat ramps) and areas of high public access. • This Zone is complemented by the Dutton Bay Islands Conservation Park. • According to publicly available data it also provides for high catch areas from the abalone and rock lobster industries. • This Zone is included in the Coffin Bay Wetlands system, which is registered on the <i>Directory of Important Wetlands</i> and is also listed as a 'High Conservation Value Aquatic Ecosystem'. • This Zone is complemented by a netting closure. • The Zones in this area provide for aquaculture zones, leases and associated vessel traffic.
Zone E: North west end of Mount Dutton Bay	2 km ²	<p>The possible Sanctuary Zone represents the following habitats:</p> <ul style="list-style-type: none"> • The shorelines represented in this possible Sanctuary Zone are; sheltered cliffs, sheltered coarse sand beach, and sheltered fine medium sand beach, as well as supratidal saltmarsh habitat. • Benthic habitats are all in shallow water environs (< 10m) and include; soft-bottom habitats and areas of sparse patchy seagrass. There is also a minor estuarine channel and flood plain delta, typical of an estuarine environment. • The Zone represents a relatively rare north/south facing bay which is open to the predominant south westerly winds. <p>Other important features and natural processes</p> <ul style="list-style-type: none"> • The waters of the Port Douglas system constitute the largest estuarine system on Eyre Peninsula and the second largest in SA • This vicinity of the bay system experiences a seasonal hypersaline environment due to shallow waters, evaporation and limited tidal exchange. • A nursery area for macro-invertebrates such as the western king prawn, sand crabs, mud cockles, octopus & scallop species, as well as periodic habitat for the vulnerable leatherback turtle. • Due to the shallow and protected nature of the bays, they experience significant summer / winter sea surface temperature fluctuations (up to 16°). • Unvegetated soft bottom and seagrass beds provide spawning, breeding and nursery areas for a wide variety of fish (King George whiting, Australian salmon, tommy ruff, garfish flathead and flounder species) and invertebrates (sand crabs, octopus and scallops), as well as being utilised by common and bottlenose dolphins for feeding, breeding and calving. <p>Social and economic considerations</p> <ul style="list-style-type: none"> • This possible Sanctuary Zone is located to provide for commercial mud cockle effort, recreational fishing effort, areas of high activity (boat ramps) and areas of high public access. • This Zone provides for aquaculture zones, licenses and associated vessel traffic. • This Zone is included in the Coffin Bay Wetlands system, which is registered on the <i>Directory of Important Wetlands</i> and is also listed as a 'High Conservation Value Aquatic Ecosystem'. • This Zone is complemented by a netting closure. • The Zones in this area provide for aquaculture zones, leases and associated vessel traffic.
Zone F: Mouth of Coffin Bay	33 km ²	<p>The possible Sanctuary Zone represents the following habitats</p> <ul style="list-style-type: none"> • The shoreline in this Zone is classified as sheltered coarse sand beach. • This Zone is designed to include a transition from the coast to shallow intertidal waters to the deeper waters in the mouth of the bay. • This Zone represents areas of soft-bottom habitats as well as predominantly dense seagrass (which includes some patchy seagrass areas) in waters up to 30 m deep. • There is also a macroalgae community in waters in the 10 - 30m depth class. • Depth classes and associated habitats represented near the mouth of the bay are deeper than the inshore bays and inlets. <p>Other important features and natural processes</p> <ul style="list-style-type: none"> • The waters of the Port Douglas system constitute the largest estuarine system on Eyre Peninsula and the second largest in SA.

		<ul style="list-style-type: none"> • The Zone experiences the mixing of upwelling waters into the mouth of the harbour. • This is a low energy zone, as predominant south-west swell and wind is blocked by the Coffin Bay Peninsula. These are highly productive waters, which support dense and diverse populations of phytoplankton and zooplankton and associated marine food web. This in turn supports a food source (pilchards) for seabirds, including little penguin, terns and gannets. • The Zone contains a nursery area for macro-invertebrates such as the western king prawn, sand crabs, mud cockles, octopus & scallop species, as well as periodic habitat for the vulnerable leatherback turtle. • Due to the shallow and protected nature of the bays, they experience significant summer/winter sea surface temperature fluctuations (up to 16°). • Unvegetated soft bottom and seagrass beds provide spawning, breeding and nursery areas for a wide variety of fish (King George whiting, Australian salmon, tommy ruff, garfish flathead and flounder species) and invertebrates (sand crabs, octopus and scallops), as well as being utilised by common and bottlenose dolphins for feeding, breeding and calving. <p>Social and economic considerations:</p> <ul style="list-style-type: none"> • This possible Sanctuary Zone has been designed in an attempt to provide for heavy recreational fishing effort at Point Sir Isaac, Farm Beach and The Frenchman. • This Zone is complemented by the Coffin Bay National Park. • This Zone has easily identifiable east/west boundaries. • According to publicly available data it also provides for high catch areas from the abalone and rock lobster industries. • This Zone is included in the Coffin Bay Wetlands system, which is registered on the <i>Directory of Important Wetlands</i> and is also listed as a 'High Conservation Value Aquatic Ecosystem'. • This Zone is complemented by a netting closure. • The Zones in this area have been designed to provide for areas of high activity (boat ramps) and areas of high public access. • The Zones in this area provide for aquaculture zones, leases and associated vessel traffic. • This Zone has been positioned to provide for fishing effort from the West Coast Prawn Fishery.
<p>Zone G: Misery Bay</p>	<p>41 km²</p>	<p>The possible Sanctuary Zone represents the following habitats</p> <ul style="list-style-type: none"> • The shorelines of this Zone comprises of fine medium to coarse sand beaches and cliffs exposed to medium to high energy waves. • The coast in this Zone consists of highly exposed bedrock platform. • The benthic habitats in this Zone include a small amount of granite rocky reef and is largely mapped as soft-bottom habitats and unmapped areas in a range of depth classes through to 50m deep. • The Zone provides a connected transition of habitat types from the coast through to the deeper unmapped habitats. <p>Other important features and natural processes</p> <ul style="list-style-type: none"> • This Zone has a high degree of 'naturalness' due to its isolation and low public access. • This Zone is in the immediate vicinity of summer/autumn coastal upwellings and as such is an area of high productivity and supports complex food webs. • The waters in this Zone are situated on one of the highest energy and most dynamic stretches of exposed coastline in SA. • The coastal waters of this possible Sanctuary Zone are influenced by large fluctuations in sea surface temperature between winter and summer. • The waters in this Zone are considered to be an important area for larval abalone, and an important area for various life stages of southern rock lobster, particularly juveniles. • The reef habitat supports green, brown, red and encrusting, coralline algae. <p>Social and economic considerations</p> <ul style="list-style-type: none"> • This possible Sanctuary Zone is complimented by Coffin Bay National Park. • For ease of identification, compliance and enforcement, the Zone uses straight north, south, east and west lines.
<p>Zone H: Point Whidbey</p>	<p>43 km²</p>	<p>The possible Sanctuary Zone represents the following habitats</p> <ul style="list-style-type: none"> • The shoreline is predominantly composed of highly exposed bedrock platform, with cliffs exposed to moderate to high swells. • The benthic habitats in this Zone include granite reef and bare sand in a range of depth classes through to 50m deep. <p>Other important features and natural processes</p> <ul style="list-style-type: none"> • This Zone has a high degree of 'naturalness' due to its isolation and low public access.

		<ul style="list-style-type: none"> • This Zone is in the immediate vicinity of summer/autumn coastal upwellings and as such is an area of high productivity and supports complex food webs. • The waters in this Zone are situated on one of the highest energy and most dynamic stretches of exposed coastline in SA. • The waters in this possible Sanctuary Zone are considered to be an important area for larval abalone, and an important area for various life stages of southern rock lobster, particularly juveniles. • The reef habitat supports green, brown, red and encrusting, coralline algae. • This Zone connects deep water habitat with a shoreline habitat. <p>Social and economic considerations:</p> <ul style="list-style-type: none"> • This possible Sanctuary Zone is complemented by the Coffin Bay National Park and the Whidbey Wilderness Protection Zone, establishing a protected corridor between the land and the sea. • For ease of identification, compliance and enforcement, the Zone uses straight north, south, east and west lines.
Zone I: Rocky Island and surrounding State waters	110 km ²	<p>The possible Sanctuary Zone represents the following habitats</p> <ul style="list-style-type: none"> • This possible Sanctuary Zone includes inselberg landforms of geologically significant Archean Granite from the Sleaford Complex (approx 2500 million years old) surrounded by ocean. • While habitats within this Zone are mainly unmapped, there is a wide range of depth classes from the intertidal zone to very deep waters (> 50m). This includes exceptionally steep depth gradient to waters approximately 90m in depth. These factors indicate a significant range of habitat types are within the area. <p>Other important features and natural processes</p> <ul style="list-style-type: none"> • This Zone has a high degree of 'naturalness' due to its isolation. • There is strong stratification in the water within this Zone with other influences including high water clarity, swell energy and the Leeuwin Current. • The exposed cliffs and island coastline are subject to strong deepwater swells and wave energy. • This Zone is also within very close proximity to the continental shelf margin. • The Zone is isolated from the influences of the cold water upwellings. • Lower water turbidity, and very clear waters relative to other parts of the coast, is a feature of this Zone. • There is a temperature gradient from inshore upwelling influenced areas, and a high density and diversity of fish fauna, including significant populations of higher level (food web) fish and mature fish. • Rocky Island South hosts an Australian sea lion haul out site (possible breeding colony) and a New Zealand fur seal breeding colony. • This area is a feeding, resting and aggregation areas for a range of species including the vulnerable white shark, southern bluefin tuna, and other oceanic species such as blue and mako sharks. <p>Social and economic considerations</p> <ul style="list-style-type: none"> • This possible Sanctuary Zone is complemented by the Rocky Island South Conservation Park. • Due to its isolated nature, this possible Sanctuary Zone is not an area of high recreational fishing activity, although it is a destination for some charter fishers.
Zone J: Shoal Point	45 km ²	<p>The possible Sanctuary Zone represents the following habitats</p> <ul style="list-style-type: none"> • This possible Sanctuary Zone contains a long fine-medium sand beach with 300m sandbar / surf zone exposed to high wave energy which is backed by 10km wide active dunes. • A small section to the south of medium height cliffs is protected in places by fronting low tide terrace. • The benthic habitats are largely either soft-bottom habitats or unmapped in depth classes from the shoreline to approximately 50m deep. <p>Other important features and natural processes</p> <ul style="list-style-type: none"> • There are a variety of shoreline processes (variances in wave energy, refraction, focus and steepness as well as sediment and nutrient supply and transport) due to the coastal topography (dune fields, headlands, cliffs, wave-cut platforms, beaches, coves), and this possible Sanctuary Zone encompasses the transition of habitats from the coastal/intertidal zone to 5 km offshore. • This Zone is in the immediate vicinity of summer/autumn coastal upwellings and as such is an area of high productivity and supports complex food webs. • The waters in this Zone are situated on one of the highest energy and most dynamic stretches of exposed coastline in SA.

		<p>Social and economic considerations</p> <ul style="list-style-type: none"> • This possible Sanctuary Zone is located to provide for recreational fishing effort at Gonyah and Almonta beaches. • According to known data this Zone crosses into a high catch area for the abalone industry.
Zone K: South of Stuart Point	26 km ²	<p>The possible Sanctuary Zone represents the following habitats</p> <ul style="list-style-type: none"> • The shorelines in this Zone predominantly represent very exposed high cliffs with basement bedrock platforms to high energy wave action. • Benthic habitats include granite rocky reef close to the shoreline in waters < 10m deep as well as soft-bottom habitats and unmapped habitat in waters from 0 - 50m deep. <p>Other important features and natural processes</p> <ul style="list-style-type: none"> • This possible Sanctuary Zone encompasses the transition of habitats from the coastal/intertidal zone to 3 nm offshore, and contains a variety of shoreline processes (variances in wave energy, refraction, focus and steepness as well as sediment and nutrient supply and transport) due to the coastal topography (sea stacks, tombolos, headlands, cliffs, wave-cut platforms, beaches, coves). • This Zone connects deep water habitat to the intertidal zone, providing connectivity between depth classes and different habitats. • This Zone is in the immediate vicinity of summer/autumn coastal upwellings and as such is an area of high productivity and supports complex food webs. • The waters in this Zone are situated on one of the highest energy and most dynamic stretches of exposed coastline in SA. <p>Social and economic considerations</p> <ul style="list-style-type: none"> • This possible Sanctuary Zone is located to provide for recreational fishing effort at Gonyah and Almonta beaches.
Zone L: Cape Carnot & Liguanea Island	106 km ²	<p>The possible Sanctuary Zone represents the following habitats</p> <ul style="list-style-type: none"> • There are a variety of shorelines in this Zone, predominantly exposed and moderately exposed bedrock platform, exposed cliffs and to a lesser extent exposed and moderately exposed coarse sand beaches. • There are several benthic habitats represented, including granite rocky reef, soft-bottom habitats, and unmapped areas in depths ranging from the intertidal zone to > 50m deep. • This Zone also contains offshore island habitat and the transition of habitats from a rocky cliff shoreline to more than 5 km offshore. <p>Other important features and natural processes</p> <ul style="list-style-type: none"> • This region is one of the highest energy and most dynamic stretches of exposed coastline in SA. • This Zone is in the immediate vicinity of summer/autumn coastal upwellings and as such is an area of high productivity and supports complex food webs. • There are Australian sea lion and New Zealand fur seal breeding colonies, as well as habitat for resident coastal shore birds, including endangered osprey, endangered white-bellied sea eagle, short-tailed shearwater and rare Cape Barren goose. Rare sooty oystercatchers, white-faced herons and crested terns also frequent the area. • A variety of shoreline processes are present in this possible Sanctuary Zone (variances in wave energy, refraction, focus and steepness as well as nutrient and sediment supply and transport) due to the coastal topography (headlands, cliffs, wave-cut platforms, beaches, coves). <p>Social and economic considerations</p> <ul style="list-style-type: none"> • This possible Sanctuary Zone is in a medium catch block for the abalone industry. • Due to its isolated nature, this Zone is not subjected to heavy recreational fishing effort. • This Zone has easily identified north/south boundaries. • Cape Carnot is a 'geological monument of international significance' composed of Archean Sleaford Complex Granite formation (≈ 2500 million years BP). • This Zone includes the Liguanea Island National Park.

<p>Zone M: 1km off the coast in the centre of Sleaford Bay extending to park boundary</p>	<p>182 km²</p>	<p>The possible Sanctuary Zone represents the following habitats</p> <ul style="list-style-type: none"> • This Zone contains almost exclusively soft-bottom habitat, with significant areas still unmapped. • The design of this Zone aims to represent transition and connectivity between habitats of various depth classes from the 0 - 10m depth class to waters greater than 50m deep. <p>Other important features and natural processes:</p> <ul style="list-style-type: none"> • This possible Sanctuary Zone has been positioned to contribute protection towards the southern right whale aggregation area. • The waters in this area are considered to be a breeding and nursery area for school and gummy sharks, as well as feeding habitat for resident coastal shore birds (shearwaters, terns, gulls and gannets). • This Zone abuts a long, exposed sandy beach coastline and associated longshore sediment transport regime. <p>Social and economic considerations</p> <ul style="list-style-type: none"> • This possible Sanctuary Zone is designed with a shoreline buffer to avoid impacting on recreational fishing at Millers Hole and Salmon Hole. • This Zone is adjacent to the Lincoln National Park, establishing a protected corridor between the land and the sea. • This Zone has easily identified north/south boundaries.
<p>Zone N: Cape Tournefort and Curta Rocks</p>	<p>33 km²</p>	<p>The possible Sanctuary Zone represents the following habitats</p> <ul style="list-style-type: none"> • The coastline represented in this Zone includes exposed cliff and exposed fine medium sand beaches, as well as offshore island habitat. • There is heavy limestone or calcarenite rocky reef, soft-bottom habitats and unmapped habitat represented in depth classes through to approximately 50m deep. • This Zone provides transition and connectivity between various depth classes and associated ecosystems. <p>Other important features and natural processes</p> <ul style="list-style-type: none"> • This area is one of the highest energy and most dynamic stretches of exposed coastline in SA. • These waters and coastline contain a haul out site for the vulnerable Australian sea lion and New Zealand fur seal, a southern right whale aggregation area, as well as sea bird nesting sites (little penguins, short-tailed shearwaters and storm petrels). • This area is geologically significant with Lincoln Complex Granite Formation (≈1800 – 1580 million years BP). <p>Social and economic considerations</p> <ul style="list-style-type: none"> • This possible Sanctuary Zone is designed to provide for recreational fishing at Wanna and Curta Rocks. • This Zone is adjacent to the Lincoln National Park, establishing a protected corridor from the land to the sea.
<p>Zone O: Waters surrounding Smith, Lewis & Little Island</p>	<p>28 km²</p>	<p>The possible Sanctuary Zone represents the following habitats</p> <ul style="list-style-type: none"> • Seafloor habitats in this Zone are composed of soft-bottom habitats, heavy limestone or calcarenite rocky reef, unmapped areas and offshore island habitat. • This Zone is in a region with exceptionally steep depth gradients from the island shoreline to waters greater than 50m deep, resulting in a variety of habitat types. <p>Other important features and natural processes</p> <ul style="list-style-type: none"> • This area experiences a seasonal thermohaline (temperature and salinity) barrier which isolates the waters and species associations between the Spencer Gulf and the Southern Ocean waters of the shelf, as well as being in close proximity to steep depth gradients of Thorny Passage and the mouth of Spencer Gulf. • This area is subject to significant tidal and current flows and seasonal nutrient and sediment exchange, arising from seasonal upwellings. This supports high productivity and complex species associations. • These waters are favourable habitat for the white shark (known to patrol the thermohaline barrier, as well as local pinniped colonies) • This area is exceptionally exposed to swell, wind and tide, and is in the path of the Spencer Gulf Current, which initially flows northwards along the western edge of the Gulf, transporting sediment and nutrients. • Smith Island is the only conclusive South Australian nesting site for rare fleshy-footed shearwaters, as well as providing nesting and roosting sites for other coastal birds (short-tailed shearwaters and white-faced storm-petrels). • A breeding colony for the vulnerable Australian sea lion is present on Smith Island.

		<p>Social and economic considerations</p> <ul style="list-style-type: none">• This possible Sanctuary Zone is designed to provide for heavy recreational fishing effort at Williams and Hopkins Islands, and is positioned so that it does not encroach on charter boat activity to the south east.• This Zone is adjacent to the Lincoln National Park and Memory Cove Wilderness Protection Area.
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This table shows the environmental values represented in each possible Sanctuary Zone within the Thorny Passage Marine Park

Environmental Values	Units	Possible Sanctuary Zones															Total in all Zones	Total in Marine Park
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O		
Ecologically Important Species																		
Australian Sealions (breeding sites)	Count											1				2	3	5
Australian Sealions (haulout sites)	Count								1						1	1	3	11
Coastal Shorebird Sites	Count	1	25				16	2		3		2	1		3		53	275
New Zealand Fur Seals (breeding sites)	Count								1			1					2	6
Reef Fish Sites	Count															1	1	15
Sea Bird Breeding and Nesting Sites	Count											1		7	4		12	39
Underwater Habitats																		
Cobble (0 to -10m)	Km ²			<1													<1	<1
Invertebrate Community (0 to -10m)	Km ²			3													3	6
Macroalgae (0 to -10m)	Km ²	<1	<1														<1	2
Macroalgae (-10 to -30m)	Km ²						3										3	3
Reef (0 to -10m)	Km ²	<1	<1		<1			2	2			<1	2		<1	1	7	36
Reef (-10 to -30m)	Km ²							1	1				1		<1	1	5	16
Reef (-30 to -50m)	Km ²												<1		1	<1	2	5
Reef (>-50m)	Km ²												<1				<1	3
Seagrass (0 to -10m)	Km ²	1	1	2	<1	1	12										18	161
Seagrass (-10 to -30m)	Km ²						9										9	23
Soft-bottom Habitat (0 to -10m)	Km ²	2	1	1	<1	<1	1	3	<1		9	2		1	2	6	28	131
Soft-bottom Habitat (-10m to -30m)	Km ²						8	16	3		12	9	1	7	5	4	65	192
Soft-bottom Habitat (-30m to -50m)	Km ²						<1	9	3		13	1	1	22	6	14	69	158
Soft-bottom Habitat (>-50m)	Km ²								<1					31		1	31	75
Unmapped (0 to -10m)	Km ²	<1	<1	<1	<1	<1		<1	<1	1	<1	<1	4		<1	<1	6	21
Unmapped (-10 to -30m)	Km ²							<1	3	1		1	5		<1	<1	10	85
Unmapped (-30 to -50m)	Km ²							8	23	4	10	13	11		3	<1	73	471
Unmapped (>-50m)	Km ²								8	103			77	122	15	<1	325	1074
Shore Habitats																		
Boulder Beach (Sheltered)	Km																	3
Bedrock Platform (Exposed)	Km								8			<1	6			1	15	65
Bedrock Platform (Moderate)	Km												2				2	10
Bedrock Platform (Sheltered)	Km															5	5	8
Cliff (Exposed)	Km							6			2	4	3		2		18	46
Cliff (Moderate)	Km															1	1	8
Cliff (Sheltered)	Km	2	8	3	1	1										3	18	77
Coarse Sand Beach (Exposed)	Km							2					1				2	13
Coarse Sand Beach (Moderate)	Km							<1	<1							<1	1	7
Coarse Sand Beach (Sheltered)	Km		1	1		1	2										6	68
Emergent Land	Count		3										3			1	7	26
Estuary	Km ²	3	3	6	<1	2	33										47	290
Fine-medium Sand Beach (Exposed)	Km							2			6				1	1	9	53
Fine-medium Sand Beach (Moderate)	Km												<1				<1	4
Fine-medium Sand Beach (Sheltered)	Km					1											1	2
Mudflats and Sandflats (Sheltered)	Km																	1
Saltmarsh	Km ²	<1	<1		<1	<1											1	2
Sand Dunes (Sheltered)	Km																	<1
Offshore Islands	Count		1					1		1			1		3	3	10	33

* note that numbers have been rounded to the nearest whole number.