

South Australia's Marine Parks

5-Year Status Report 2012–2017 Summary



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Australian sea lion

Foreword

South Australia is home to some of the world’s most amazing marine plants and animals. Our state waters boast colourful marine sponge gardens, the iconic leafy sea dragon, the giant Australian cuttlefish and marine mammals such as Australian sea lions, whales and dolphins.

About 85 per cent of southern Australia’s marine life isn’t found anywhere else in the world. In 2012, the South Australian Marine Parks network was dedicated in order to conserve this significant biodiversity for the long term.

The creation of marine parks is one of the most significant environmental programmes ever undertaken in this state. Our marine parks network covers 44 per cent of SA’s waters placing us at the forefront of marine conservation.

As part of marine parks implementation, the South Australian Government is undertaking the largest ongoing marine biodiversity monitoring programme in South Australia’s history. The monitoring programme will enable us to measure ecological and socio-economic changes across the state.

To mark the half way point towards the 10-year review in 2022, we are releasing *South Australia’s marine parks 5-year status report 2012-2017*. The Report documents the activities and findings of the programme, including early ecological and socio-economic findings observed over the first five years. This brochure is a summary of the Report, and highlights some of our key findings to date.


We know that marine parks are important to South Australians. Our data tells us that 91 per cent of South Australians support marine parks to protect our marine plants and animals.

Five years on, our marine parks network is on track to protect and conserve SA’s marine life for future generations.

We will continue to track socio-economic indicators to determine if marine parks are causing changes to local businesses and communities, coastal recreation and fishing, and coastal industries.

I am proud of this important scientific programme which provides the foundation for our ongoing understanding and management of South Australia’s natural assets.

I invite you to learn more about our unique marine plants and animals and get out and experience our great marine parks.



Hon Ian Hunter MLC
Minister for Sustainability, Environment and Conservation

Our marine parks network

The establishment of South Australia’s network of marine parks is one of the most significant conservation initiatives ever undertaken in this state.

A comprehensive community engagement process supported the development of the network to ensure all existing and future users of the marine environment were considered in the establishment phase. The work required the collaboration of interested South Australians, key stakeholders and the state government. The culmination of this process was the completion of 19 marine park management plans in November 2012.

Our marine parks design

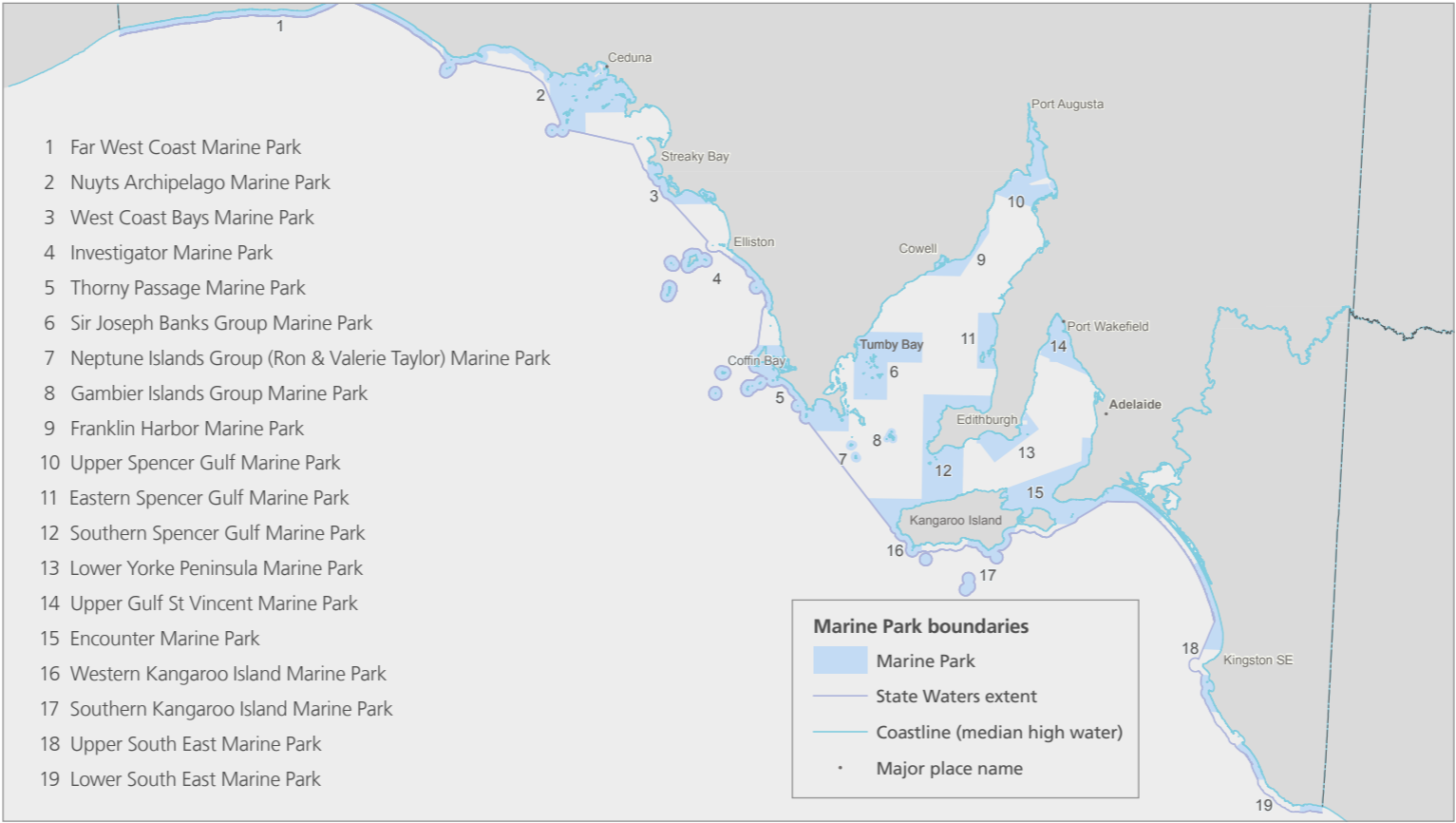
Our marine parks are multiple-use with different zones defining the activities permitted in each marine park. The network’s zones have differing levels of restrictions. 2.6 per cent of the total network area is in 27 Restricted Access Zones; 11 per cent of the total network area is in 83 Sanctuary Zones; 55.7 per cent of the total network area is in 59 Habitat Protection Zones; and 30.7 per cent of the total network area is in 42 General Managed Use Zones. The Sanctuary Zones and Restricted Access Zones combined cover 6 per cent of South Australia’s waters.

Marine Parks Act 2007

Part 2, Section 8, Clause (1) of the Marine Parks Act 2007

The objects of this Act are -

- (a) to protect and conserve marine biological diversity and marine habitats by declaring and providing for the management of a comprehensive, adequate and representative system of marine parks; and
- (b) to assist in -
 - (i) the maintenance of ecological processes in the marine environment; and
 - (ii) the adaptation to the impacts of climate change in the marine environment; and
 - (iii) protecting and conserving features of natural or cultural heritage significance; and
 - (iv) allowing ecologically sustainable development and use of marine environments; and
 - (v) providing opportunities for public appreciation, education, understanding and enjoyment of marine environments.



Map of South Australia's marine parks

Marine park management

The marine park management plans include 15 strategies that are collectively designed to achieve the six objects of the *Marine Parks Act 2007* and that are delivered through the four sub-programs of performance, compliance, stewardship, and protection.

Protection

The Protection sub-program ensures activities and uses within the parks are conducted in accordance with the *Marine Parks Act 2007* and its supporting regulations. The protection sub-program administers a permit system as well as statutory and informal referrals; and develops policies and procedures to effectively manage the parks.

Stewardship

The Stewardship sub-program helps provide opportunities for public appreciation, involvement, education, understanding and enjoyment of marine environments. The sub-program has developed signs, brochures and mobile phone apps to help support this learning. It is also responsible for involving the community in day to day management of marine parks.

Compliance

The Compliance sub-program is responsible for ensuring that the zoning regulations are enforced and the expected ecological outcomes can be achieved, especially in sanctuary zones. Effective compliance is vital for the success of the Marine Parks Program.

Performance

The Performance sub-program is responsible for establishing a monitoring, evaluation and reporting program to measure the effectiveness of each management plan in achieving the objects of the *Marine Parks Act 2007*.

Monitoring, evaluation and reporting program

Monitoring, Evaluation and Reporting Program developed six key evaluation questions that are directly related to the six objects of the *Marine Parks Act 2007*. These provide clarity about the priorities for monitoring and guide how the Marine Parks Program should be evaluated. Each question addresses specific outcomes and strategies in the context of effectiveness, impact, appropriateness and efficiency of the Marine Parks Program.

Additional supporting questions have been developed. These questions identify the monitoring indicators and methods used for information collection; assist in prioritisation of monitoring activities; and support evaluation and reporting of monitoring information.

The ultimate aim of the monitoring, evaluation and reporting program is to evaluate the effectiveness of the management plans in supporting achievement of the six objects of the *Marine Parks Act 2007*. Management plans must be reviewed at least once within a 10-year period.

Marine Parks 5-Year Status Report

South Australia's Marine Parks 5-Year Status Report 2012–2017 (the Status Report) assesses the first five years of progress by the Marine Parks Program since implementing the 19 marine park management plans. The Status Report covers the period between 2012 and 2017. The Status Report also informs the ongoing adaptive management of marine parks and will contribute to the 10-year review. It includes background information on the marine parks program; a summary of marine parks budget expenditure; a summary of program activities; and a summary of trends and early findings from ongoing ecological and socio-economic monitoring.

Importantly, the Status Report does not undertake an evaluation of the effectiveness of the management plans in delivering on the *Marine Parks Act 2007*, or an evaluation of zoning arrangements. A full evaluation will be undertaken as part of the 10-year evaluation report currently planned for completion in 2021.

Five years on, our Marine Parks Network is on track to protect and conserve SA's marine life for future generations

Ecological monitoring

One of the main objectives of our Marine Parks Program is to protect and conserve South Australia’s unique marine biodiversity and habitats. The protection afforded by marine parks will not only safeguard our marine biodiversity but will help these systems to flourish as they recover to a more natural state.

To determine whether the marine park network is achieving these goals requires the long term monitoring of our marine ecosystems. We have established a comprehensive ecological monitoring program that spans the full extent of the park network. This program measures different components of these marine ecosystems ranging from mapping the seafloor to assessing important fish and invertebrate communities using the latest techniques.



Baited remote underwater video systems (BRUVS)



Divers monitor macro-algae, fish, and macro-invertebrates



Map of monitoring and mapping locations
*BRUVS = Baited remote underwater video systems

We are undertaking the largest ongoing marine biodiversity monitoring program in South Australia’s history


152,000
FISH COUNTED


496 BRUVS SURVEYS


120 DIVE SURVEYS

1000
VIDEOS CLASSIFIED 

Monitoring techniques

BRUVS and dive surveys

Ecological data is collected by baited remote underwater video systems (BRUVS, see right) and expert diver surveys.

BRUVS record commercially and recreationally important fish species from deeper water, while divers monitor multiple components of the marine ecosystems – macro-algae, fish and macro-invertebrates.

Mapping

Mapping benthic (seafloor) habitats is an important component of the marine parks ecological monitoring program.

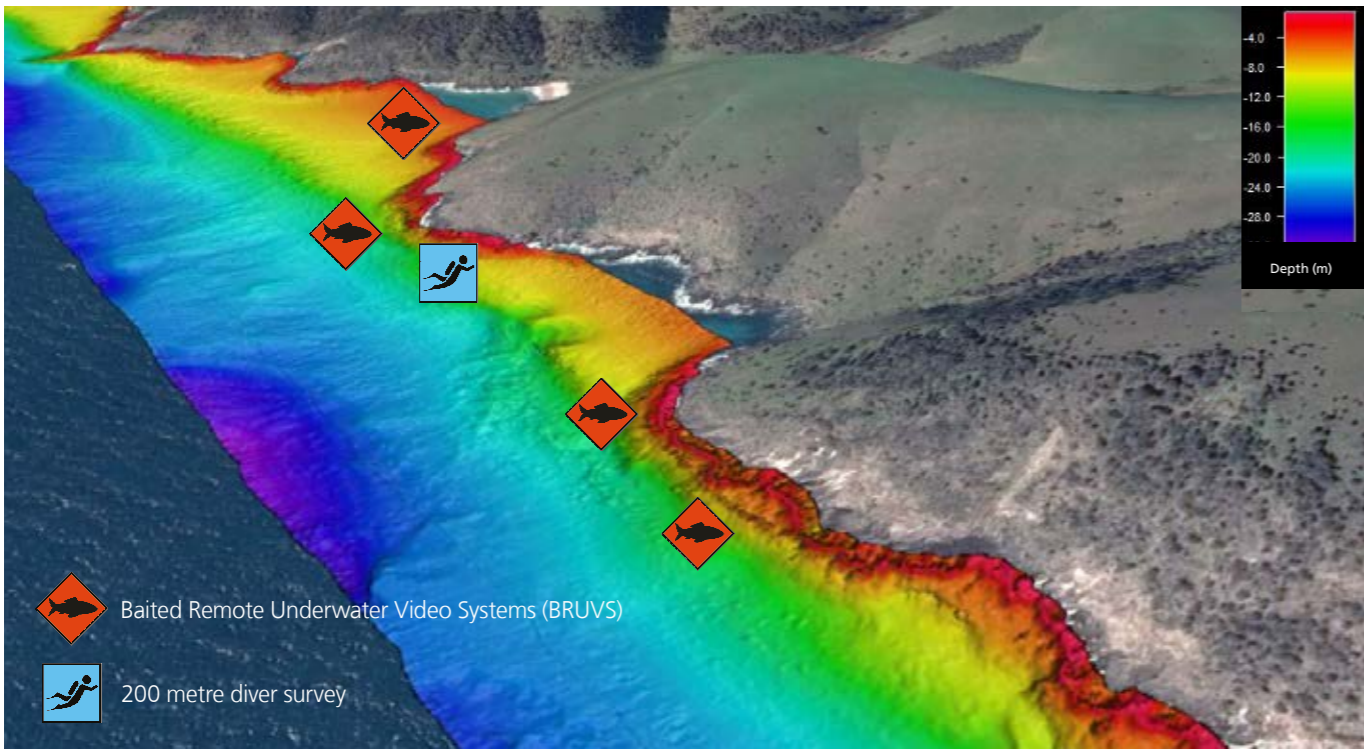
Mapping identifies what habitats are contained in the park network, which allows us to better manage those habitats and provide context for the biological data collected.

We have now characterised the habitats in 80 of the 83 sanctuary zones.

Mapping methods

There are two main mapping methods used currently.

- 1. Full cover benthic mapping using side scan swath sonar (see bottom image)
- 2. Rapid inventory mapping using a drop video camera



Swath Mapping of the Sponge Gardens Sanctuary Zone

About 85% of southern Australia’s marine life isn’t found anywhere else in the world

Key findings

- 1. The seafloor of 20 sanctuary zones has been mapped
- 2. Rapid inventory mapping is an effective way to cover large areas of the sea floor that would otherwise take decades to map

Case Study: Rock Lobster (*Jasus edwardsii*)

Background

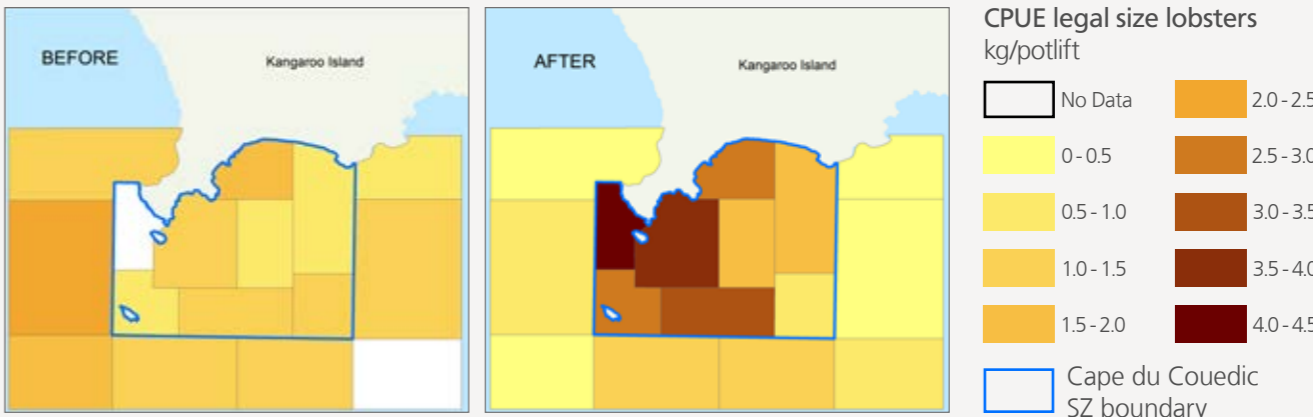
The Cape du Couedic Sanctuary Zone (CDCSZ) lies within the Western Kangaroo Island Marine Park (WKIMP) and forms part of the WKIMP management plan. In February 2017 a survey was undertaken by SARDI researchers with the SA Northern Zone Rock Lobster Fishermen's Association to determine what effect protection was having on the rock lobster populations.

The study estimated the size and abundance of rock lobster inside and outside the CDCSZ, using commercial pots and fishing techniques. Changes over the previous 20 years, in the catch rate of rock lobster, both inside and outside the CDCSZ, were also investigated by SARDI through comparison with historical fisheries survey data (see McLeay et al. 2017).

Key findings

The 2017 survey estimates of relative biomass (catch per unit effort (CPUE), kilograms per pot lift) and abundance (CPUE, number lobster per pot lift) of legal size lobsters (≥ 105 mm carapace length) were 4.4 and 3.5 times higher, respectively, inside the CDCSZ compared to outside.

Since the 2013/14 fishing season, when fishing was last permitted, there has been positive population responses within the CDCSZ. There was an 81.1% increase in relative biomass, 42.2% increase in relative abundance, and 4.1% and 12.5% increases in the mean size of legal size female and male lobsters. There was no evidence that historical catch rates were different inside versus outside the CDCSZ (see figure below).



Heat map showing historical catch rates before (1994/95–2013/14) versus after (2017 survey) implementation of the sanctuary zone (data taken from McLeay et al. 2017)

Key findings

- 1. Rock lobsters have grown larger and are more abundant inside the Cape du Couedic sanctuary zone since fishing was restricted
- 2. Catch rates of rock lobsters were the same inside and outside the Cape du Couedic sanctuary zone prior to the introduction of fishing restrictions

Our findings confirm that marine parks are protecting SA’s marine life

Findings from monitoring

We are measuring a range of indicators to assess the effectiveness of the park network, looking at how all the organisms interact across the whole ecosystem (e.g. focal species and community structure).

Monitoring focal species

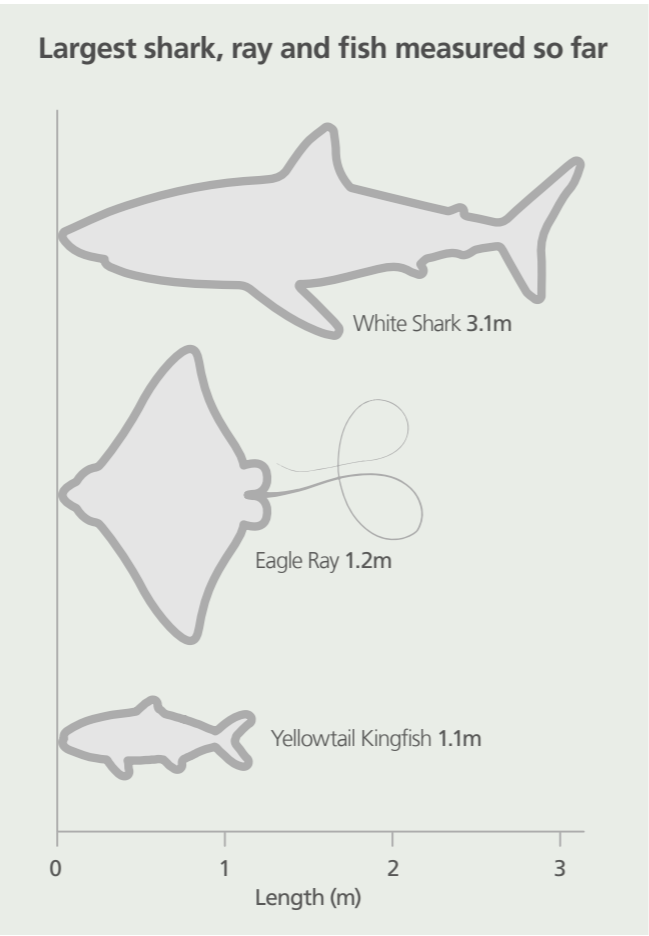
We monitor ‘focal species’ in our marine parks network as they play a key role in the ecosystem. Focal species are either:

- **Vulnerable**, that is, slow growing; site attached; small range; low fecundity (reproduction)
- **Keystone species**, that is, critical to ecosystem function
- **Iconic**, that is, recognisable and highly valued by the community
- **Indicator species**, that is, they provide an indication of the state of the system and can indicate a change.

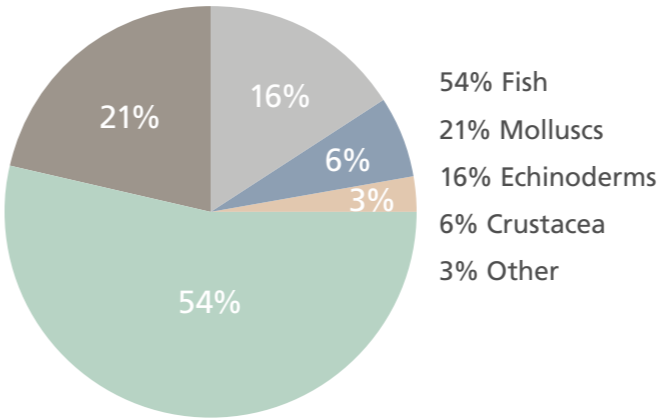
Abundance of large fish

Large fish are important because they produce more young and can prey on other animals which can be important in maintaining ecosystem balance and function – for example – blue groper eating urchins.

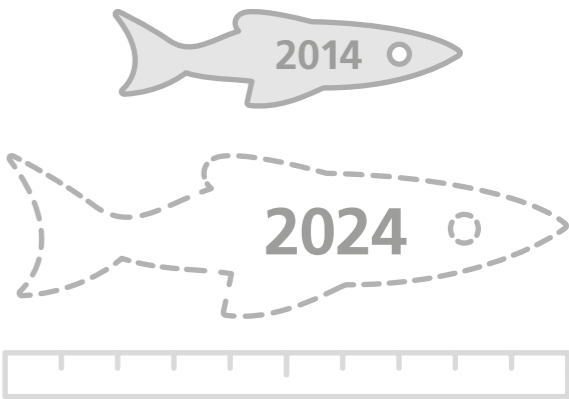
Large fish are often selectively targeted by commercial and recreational fishers and are therefore an important indicator of marine park effectiveness.



Proportion of species per taxon



Since 2012 the marine parks ecological monitoring program has recorded 384 species of fish and invertebrates. Fish make up the most diverse taxonomic group with 205 species recorded, followed by molluscs with 82 species.



Our program measures fish size. We will be able to detect if the average size of fish has increased in 10 years

Key findings

1. We are measuring a range of ecological indicators across the whole system, including size, abundance, biodiversity, focal species of fish (eg. western blue groper) and invertebrates (eg. lobsters)
2. We have established a comprehensive baseline from which to assess change over time
3. 384 species of fish and invertebrates have been recorded in marine parks, including 205 species of fish

The ecological sampling program will detect meaningful biological changes over time

Sponge Gardens Sanctuary Zone: iconic fish refuge

Background

The Sponge Gardens Sanctuary Zone is part of the Encounter Marine Park and contains one of only two deep water trenches mapped in South Australia. Fringing shallow reefs give way rapidly to the deep water trench and this bathymetry provides ideal conditions for a unique colony of large (>1 m) sponges, as well as other filter feeding animals including gorgonian corals, bryozoans and ascidians that thrive in fast currents adjacent to shore.

Data Outputs

Data shows much higher abundances of iconic species (western blue groper, blue devil, harlequin fish) in the Sponge Gardens Sanctuary Zone compared to other sanctuary zones in the same marine park (see table, below).

Iconic fish abundance in Encounter Marine Park			
Sanctuary Zone	blue groper	blue devil	harlequin fish
Sponge Gardens	101	39	15
Rapid Head	2	30	1
Carrickalinga Cliff	0	1	0
Aldinga Reef	2	2	0

Offshore islands, including Kangaroo Island, are biodiversity hotspots & are important reference sites

Key findings

1. Sanctuary zones are critical and effective at protecting long-lived, site-attached vulnerable species

2. The Sponge Gardens Sanctuary Zone is an important refuge for western blue gropers, blue devils and harlequin fish
3. Our data confirms the Sponge Gardens Sanctuary Zone is a biodiversity hotspot with unique bathymetry creating habitats for a high diversity of plants and animals

Iconic fish species

Many reef fish are long-lived, slow-growing and site-attached which means that they spend their lives living in the same small patch of reef and are particularly vulnerable to threats, including fishing.

Some important examples of these are:

- Blue devils live over 50 years and have characteristic markings on their face that can be recognised throughout their adult lives
- Harlequin fish live for over 40 years - have distinctive colour patterns and are rarely seen by divers
- Western blue groper are the largest bony, site-attached fish found living on southern reefs and grow up to 1.7 m long and live to 70 years of age.



Case Study: Jewels in the crown - monitoring offshore island sanctuary zones

Nuyts Archipelago Marine Park (NAMP) and Investigator Marine Park

The Nuyts Archipelago Marine Park (NAMP) and Investigator Marine Park (IMP) encompass a network of remote island sanctuary zones, including St Francis and Pearson Isles. These sanctuary zones are some of the ‘jewels in the crown’ of South Australia’s marine parks network. These areas are biologically diverse due to the geographical isolation and remoteness of the islands, combined with the influence of the subtropical Leeuwin Current mixing with the temperate Flinders Current.

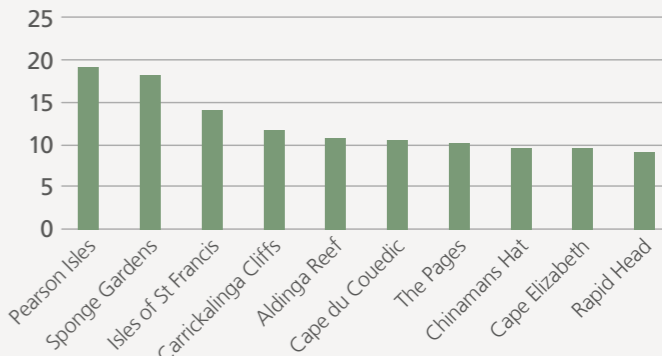
Isles of St Francis Sanctuary Zone and Pearson Isles Sanctuary Zone

The Isles of St Francis Sanctuary Zone (ISFSZ) in the NAMP is located in the remote waters off the far west coast of Eyre Peninsula. Pearson Isles Sanctuary Zone (PISZ) is located around an iconic group of islands about 30 nautical miles offshore from Eyre Peninsula within the IMP.

Monitoring offshore island sanctuary zones is important but also difficult due to their remoteness. In March 2015 a 14 day expedition to the Nuyts Archipelago and Investigator Marine Parks was undertaken on the SARDI research vessel Ngerin. The expedition also visited the Cape du Couedic Sanctuary Zone on Kangaroo Island. During the expedition the vessel traveled 1500 nautical miles, and conducted 60 seafloor video, 35 BRUVS and 32 dive surveys. Results from the expedition confirmed the high fish biodiversity in these offshore island sanctuary zones (see graph, top right).

In general, insufficient time has passed since marine park implementation for changes in size, abundance and diversity of marine life to be detected

Fish diversity (BRUVS) in sanctuary zones



Maximum number of fish species at different sanctuary zones



Pearson Isles

Key findings

1. Pearson Isles Sanctuary Zone has the highest fish diversity of all marine park sanctuary zones.
2. Offshore islands sanctuary zones have the highest abundance of large fish
3. Our data confirms that offshore islands sanctuary zones are biodiversity hotspots and important reference areas
4. We found high abundance of the colourful Maori wrasse and blue groper in the Nuyts Archipelago Marine Park



Socio-economic monitoring

Understanding the socio-economic aspect of implementing South Australia's 19 marine park management plans is essential for long-term planning, and for evaluating the outcomes of management decisions. This includes how people, industries and communities interact in them, value them, perceive them and respond to environmental and societal changes.

South Australia's marine parks network was designed to minimise potential negative impacts on businesses and the fishing industry, and to result in positive benefits by providing opportunities for education, public appreciation, business, and nature-based tourism.

A series of indicators were identified based on advice from the South Australian Centre for Economic Studies and an expert panel convened by the Goyder Institute, which were summarised according to eight broad categories: local businesses and communities, coastal recreation, tourism, cultural heritage, transport and infrastructure, aquaculture, recreational fishing, and commercial fishing.

The majority of data will be collected from sources such as the Australian Bureau of Statistics and South Australian Government agencies, and augmented by data collected by the marine parks program.

Local businesses and communities

Indicators include gross regional product, local jobs, and unemployment. Based on the socio-economic indicators that were tracked, there is no evidence of negative regional impact that correlates with the implementation of marine park management plans.



Community enjoying recreation fishing

Aquaculture and shipping

Results show that industries such as aquaculture and shipping, which were accommodated through the marine parks planning process and zoning arrangements, have continued to operate unaffected by marine parks.

Commercial fisheries are stable and valuable

In the two years since implementation of fishing restrictions in sanctuary zones, the quota has been reached in both years in the Southern Zone Rock Lobster Fishery, and 99% and 97% taken in the Northern Zone Rock Lobster Fishery. This is consistent with the previous three years, where the quota taken ranged from 94% to 99% (see Linnane et al. 2017a,b).

Similarly, in the Marine Scalefish Fishery the total catch of marine scalefish in the two years since sanctuary zones were implemented (2014/15, 2015/16) is comparable to the previous two years (2012/13, 2013/14, see Fowler et al. 2016). The trend in catch is also reflected in the retail price of locally caught and sold fish as there was no evidence from the monitoring of fish prices

(which included prices of King George whiting, snapper, garfish, calamary, yellowfin whiting and snook) that local consumers are on average paying more for locally caught finfish in 2017 than they were prior to the full implementation of marine parks on 1 October 2014.

House prices follow state-wide trend

It was predicted that the pre-marine parks trend in house sale prices would be maintained post-marine parks. The long-term increasing trend for the whole state is generally also seen in the regions adjacent marine parks at the local government area scale.

Nature-based tourism

There are several iconic species protected and managed in our marine parks that directly support the nature-based tourism industry, these include white sharks, giant Australian cuttlefish, and Australian sea lions.

White shark cage diving brings approximately \$12.8 million annually into the SA economy and has created 80 jobs.

In 2017 the giant Australian cuttlefish aggregation generated an estimated \$24,000–\$36,000 to gross regional product, from both initial and flow-on impacts, at a weekend community event.

The state maintains a database of coastal and marine tourism operators in South Australia. The total number of tour operators utilising marine parks has increased slightly from 59 in 2014 to 63 in 2017. Since 2014, four new operators have commenced operating inside marine parks: Oceanic Victor within Encounter Marine Park and Joy Flights Port Lincoln, Pure Coffin Bay Oysters and Oyster Farm Tours within the Thorny Passage Marine Park.

We will continue to track socio-economic indicators to determine if marine parks are causing changes to local businesses and communities, coastal recreation and fishing, and coastal industries

Key findings

1. Industries such as aquaculture and shipping, which were accommodated through the marine parks planning process and zoning arrangements, have continued to operate unaffected by marine parks
2. The price of locally caught fish has remained stable, commercial fisheries have maintained their catch and value, and regional house prices have continued to increase



Participation in coastal activities

Regular phone surveys of the general public have been commissioned by the South Australian Government to provide information on participation in recreational coastal activities. These surveys gauge the community use of the marine environment and marine parks in South Australia and have been conducted in the Adelaide, West/Eyre Peninsula, North/Yorke Peninsula, Central/Kangaroo Island and South East regions.

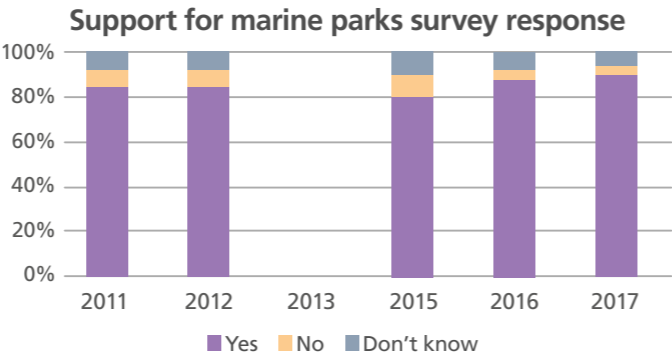
At a state-wide level, participation in activities such as fishing, boating and snorkeling has remained stable since 2008. There is little evidence of any impact on participation rates in recreational activities in the marine environment since the introduction of sanctuary zones, with more than 90 per cent of those surveyed indicating they have not changed their frequency of participation since marine park sanctuary zones were introduced.

Boat registrations and licences can be used to indicate participation in recreational boating and fishing. General boat registrations have remained relatively stable between 2007 and 2016.



Support for marine parks

General support for marine parks has remained stable since 2006 averaging 88 per cent (see graph, below). The number of people who, in general, are not in favour of marine parks to protect marine plants and animals has reduced from ten to three per cent since 2015.



Survey response to the question 'Do you support marine parks to protect plants and animals?'

Case Study: Recreational Fishing

Fishing is a popular past time for South Australians. About 1 in 5 people (277,000) partake in recreational fishing each year and fish for a total of about 1 million days annually. Just 6 per cent of state waters is included within no-take marine park zones. Recreational fishing is encouraged and promoted in marine parks in zones where fishing is allowed. Following implementation of the sanctuary zones in 2014, a number of election commitments were made and \$3.25 million was pledged to promote opportunities for recreational fishing.

Recreational fishing grants program

Between 2015–2017, nearly \$2 million in funding for 107 projects has been allocated through the Recreational Fishing Grants Program. Projects include improving access and infrastructure at popular fishing locations across the state such as creating fish cleaning stations and shelters.

Windara Reef shellfish restoration

A \$3.8 million program to build a 20 ha native shellfish reef has expanded through co-investment from the original \$600,000 State Government election commitment to build an artificial reef for recreational fishing. These shellfish reefs were prevalent before European settlement.

Windara Reef will provide habitat for many species of fish including King George whiting and snapper and will become a recreational fishing hot-spot. It is expected to boost the local economy through increased visitors.

Opening reservoirs for fishing

The South Australian Government has been working to open five reservoirs for recreational fishing. The State Government allocated up to \$400,000, with a further \$210,000 from the Australian Government, to improve access and amenities at the proposed fishing reservoir sites. A total of 209,300 fish will be stocked into the opened reservoirs. In addition, a further 238,000 Murray cod at a cost of \$250,000 are funded to be stocked into the Murray River. Approximately \$450,000 in total is being invested in stocking reservoirs.

Benefits

Almost \$2 million has been invested to improve fishing facilities and creating new recreational fishing opportunities. The three initiatives have numerous socio-economic benefits such as; encouraging fishing related tourism to expand, and increasing appreciation, understanding and enjoyment of the marine environment.



91% of South Australians support marine parks to protect marine plants and animals

Key findings

Participation rates for recreational activities such as snorkelling, fishing and boating have remained stable



Compliance

Most South Australians support conservation of our marine environment because they recognise the importance of ensuring its long-term viability. Community support and voluntary compliance is integral to the success of marine parks.

The South Australian Government conducts regular patrols to marine sanctuary zones to check compliance and to educate the community on the location of the no-take zones and, where necessary, issue warnings or expiation notices to repeat offenders. The Compliance Strategy prioritises voluntary compliance supported by education and awareness (also delivered through the Stewardship program) followed by effective deterrence and appropriate enforcement.

Marine Park Patrols			
	2014/15	2015/16	2016/17
Shore patrols	1567	2261	2840
Boat patrols	82	208	159
Aerial patrols	15	61	106
Camera patrols	0	451	1460

Marine Park Compliance Outcomes			
	2014/15	2015/16	2016/17
Reported incidents	170	293	215
Education letters	11	20	3
Warnings	71	169	145
Expiations	0	6	3

Number and type of patrol and actions taken by the marine parks compliance team between 2014 and 2017.

The total number of patrols to marine parks has increased from 1664 in 2014/15 to 4565 in 2016/17. Patrols are made from the shore, boat, air or by cameras which were introduced as a surveillance method in 2015/16.

Since 2014/15 there have been a total of 678 incidents reported, as well as 34 education letters, 385 warnings and 9 expiations issued.

A large part of the compliance program involves educating marine users about marine park zones and the activities permitted within the different zones. As part of South Australia's efforts to maximise voluntary compliance, 107 signs were placed at popular locations across the State near marine parks such as beach entry points and boat ramps. Compliance officers and regional staff have spoken to around 300 boat owners at ramps since 2015/16 educating them about marine park zones. There is also a recreational fishing guide app which is free to download and provides information on sanctuary zone locations. Education and a compliance presence has been effective in reducing non-compliant marine park activities (see Zanoni case study page 17).



Land-based surveillance for illegal activities

Case Study: Zanoni historical shipwreck

The Zanoni sank while travelling from Ardrossan to Adelaide in 1867. The wreck was discovered in 1983 and lies within the boundaries of the Offshore Ardrossan Sanctuary Zone as part of the Upper Gulf St Vincent Marine Park (UGSVMP). It is protected by both the *Historic Shipwrecks Act 1981* and the *Marine Parks Act 2007*.

The Zanoni wreck is an important aggregation site for snapper, and is also an attractive site for divers who may enter the 550 metre exclusion zone under a permit. Entering the exclusion zone without a permit, anchoring a vessel or fishing at the Zanoni wreck is illegal and causes damage to the wreck and compromises the biodiversity outcomes of the sanctuary zone.

In March 2015, there was an increase in community concern regarding offences at the wreck site. In response, the South Australian Government increased patrols to the area and witnessed up to 13 boats at the wreck site on a single visit. Targeted education of boat owners was undertaken with a total of 130 vessels engaged. This included 11 commercial vessels (marine scale fishers) as well as vessels leaving from ramps in Ardrossan and from the other side of Gulf St Vincent at North Haven and St Kilda. Through aerial and boat patrols, vessels breaching sanctuary zones are able to be identified and prosecuted. To date, there have been 30 prosecutions for breaches at the Zanoni site. Since the targeted patrolling and education efforts in 2015, subsequent patrols through busy periods such as Christmas and New Year observed just a single vessel on the wreck at any time. Patrols during Easter 2017, reported no offenders at the wreck site, suggesting that education efforts are having a positive impact.



Zanoni shipwreck



Marine life on the shipwreck

The majority of South Australians recognise the value of our marine parks and voluntarily comply with park zoning

Key findings

1. A total of 7299 shore, boat and aerial compliance patrols undertaken, leading to 678 incidents identified, 34 education letters, 385 warnings and 9 expiation notices issued
2. 107 marine park zoning signs were placed across the state at popular locations such as beach entry points and boat ramps to help maximise voluntary compliance

Stewardship Outreach

The stewardship program is responsible for delivering the management plan strategies which aim to provide opportunities for public appreciation, involvement, education, understanding and enjoyment of marine parks and the marine environment. This section presents a few highlights of the program's achievements.

The stewardship program has focused on recreational users of marine parks, providing them with maps, brochures, guides and general information. These can be found on various websites, phone apps and printed material such as the recreational fishing guide (see bottom right image). Stewardship has also been actively involved in school education, citizen science, public presentations, attendance at community events like boat shows and supporting the Experiencing Marine Sanctuaries program (see page 19). All these activities provide opportunities for public appreciation, involvement and education of marine parks.



Interpretive signs have been installed on the Admirals Arch boardwalk reaching an annual audience of about 120,000 people.

A total of 42 interpretive and educational products were developed between 2013 and 2017 to provide for public appreciation and awareness of marine parks. These include interpretive signage, brochures, handouts, website articles and videos.



School students learning about marine parks.

Outreach events have targeted school students and marine user groups through schools, fairs, fishing and specialty events. Since 2014/15 there have been 120 stewardship events reaching over 77,000 people. School events since 2012/13 have reached about 23,000 students through 71 events at 17 schools.

The South Australian Government has allocated nearly \$2 million in funding for 107 projects to encourage use of marine parks and enhance the recreational angler experience. This funding has gone towards improving access to fishing locations, building infrastructure such as jetty shelters and fish cleaning stations, and stocking freshwater reservoirs with over 200,000 fish. The SA Government also invested \$600,000 to create the Windara native shellfish reef that will also provide fishing opportunities.

Over 300,000 recreational fishing guides were produced and distributed providing information to marine park users about what activities can occur where in the marine parks network



Case Study: Experiencing Marine Sanctuaries



Swimming with our iconic species

Providing opportunities for public appreciation, involvement, education, understanding and enjoyment of marine environments is central to the success of South Australia's marine parks network, and is integral to the implementation of marine park management plans. To help achieve this, marine parks supports Experiencing Marine Sanctuaries Inc. (EMS), a non-government organisation that provides safe and supervised snorkeling experiences in South Australia's marine parks. EMS is a not-for-profit organisation run by a management committee of volunteers with diving, marine biology and community engagement backgrounds. EMS is based on the highly successful New Zealand program Experiencing Marine Reserves, which has been running for over 13 years.

EMS is a partnership between state government, NRM and philanthropic donations in-kind. EMS provides an experiential program for school students and community members to help achieve better protection of the marine environment through education and advocacy.

An important component of this work is to give students and their parents a safe and professionally supervised experience in the marine environment. Whenever possible, this includes experiencing environments outside of marine sanctuaries, as well as those inside marine sanctuary zones, with particular emphasis on comparing the diversity and abundance of organisms in each location. Having a ratio of one adult to two students assists with supervision, ensures a strong connection with the community, and also builds intergenerational links.

Snorkelling experiences include:

- Swimming with cuttlefish in Upper Spencer Gulf Marine Park (about 400 participants since 2016)
- Visiting various sites in Encounter Marine Park including Port Noarlunga Reef Sanctuary Zone, Second Valley, Victor Harbor, Port Willunga and Rapid Bay Jetty (over 1200 participants since 2015)
- Snorkelling at Tumby Bay Jetty in Sir Joseph Banks Group Marine Park (100 participants since 2016) and other sites across Eyre Peninsula including Streaky Bay and Smooth Pool.

Socio-economic outcomes

There is potential for this type of activity to make positive contributions to local economies. For example about 240 snorkelers joined EMS to see the giant Australian cuttlefish in Upper Spencer Gulf Marine Park, near Whyalla, in July 2017. An economic assessment indicated that the event contributed an estimated \$24,000–\$36,000 to gross regional product from both initial and flow-on impacts.

Key findings

1. 26 citizen science projects have been undertaken involving approximately 500 community members
2. Over 120 marine-park related community events reaching over 77,000 people since 2014/15
3. 71 marine park education events reaching over 23,000 students at 17 schools have taken place since 2012/13

Our sanctuary zones offer experiences in nature like nowhere else, including the annual aggregation of SA's iconic giant Australian cuttlefish

Protection

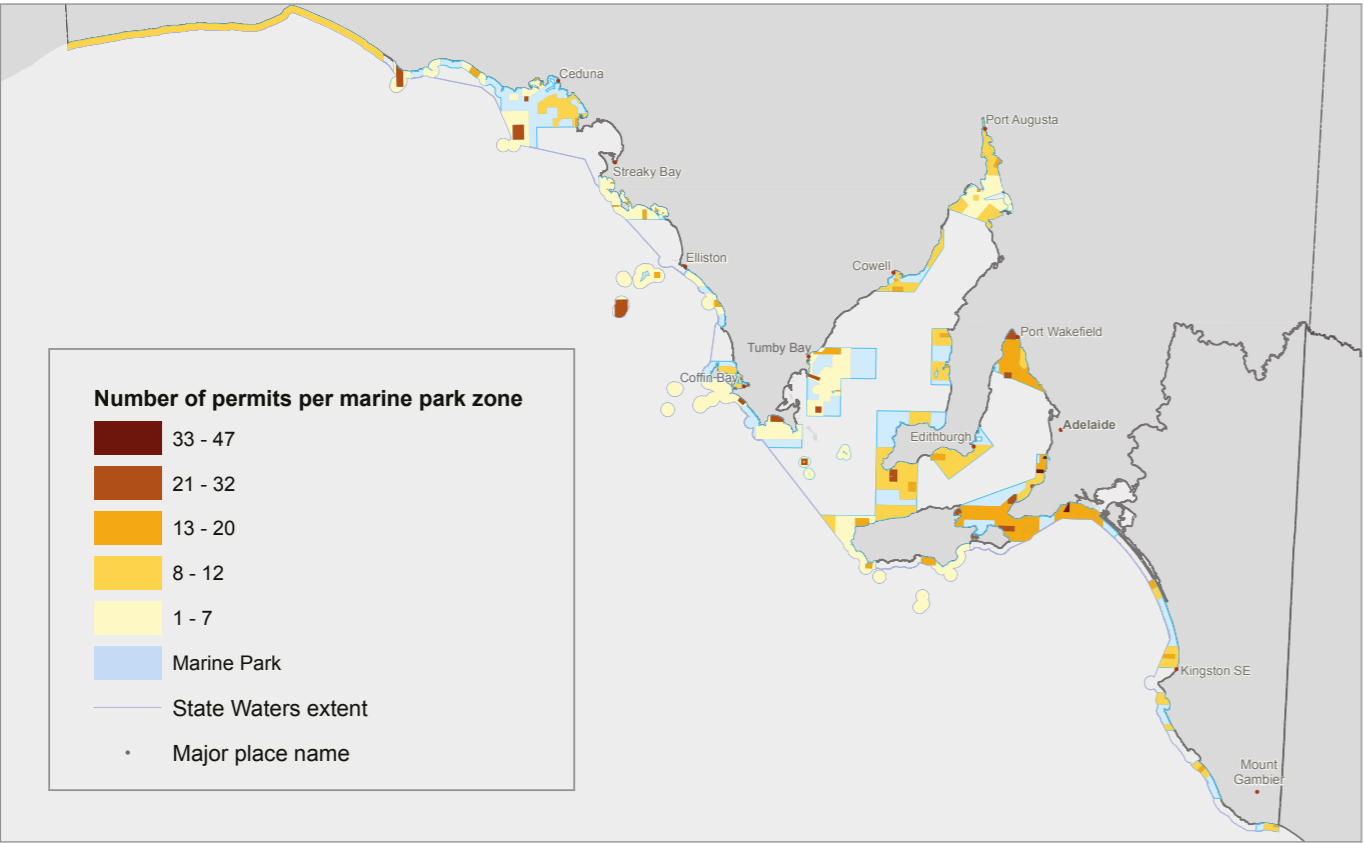
The *Marine Parks Act 2007* provides that the Minister for Sustainability, Environment and Conservation may issue a permit to allow an activity that would otherwise be restricted or prohibited in a marine park.

Issuing of permits ensures conservation values are maintained, cumulative impacts of activities are considered and provides a mechanism that supports consistency of management practices across the marine parks network.

To facilitate the permits process, a permits page has been created on the marine parks website www.environment.sa.gov.au/marineparks/permits. This page provides information on requirements for each of the five types of permits referred to in the management plans, criteria for fee waiver, and a permit application form.

A total of 160 permits have been issued since November 2012 and 94 of these were for research activities. Research permits have been issued in all 19 marine parks. Filming, tourism and competitions have occurred in Nuyts Archipelago, Thorny Passage, Upper and Southern Spencer Gulf and Encounter Marine Parks.

Number of permits issued for each category	
Permit type	Permits issued
Scientific research in a sanctuary zone or restricted access zone	94
Competitions and organised events in a sanctuary zone	24
Commercial film making (including sound recording and photography) in a sanctuary zone	6
Tourism operations in a sanctuary zone	12
Other, includes activities such as acoustic monitoring and sediment sampling	24
Total number of permits issued	160



Map of distribution of marine park permits

Case Study: Research using drone technology

Southern right whale research

The Head of Bight is an important breeding and calving ground for the southern right whale, and a haul out and breeding area for the Australian sea lion. Approaching these whales for monitoring purposes can result in negative impacts on their behaviours, particularly when young animals are involved and monitoring methods can be both expensive and dangerous. To overcome this, we worked collaboratively with university researchers to find ways to use remotely piloted aircraft (drones)

In 2016, Dr Fredrik Christiansen from Murdoch University began a project to use drones to gain an understanding of the health of the southern right whale population. In addition, work was done to consider the impacts of using drones on the whales. The use of drones for research in the Far West Coast Marine Park restricted access zone required a marine parks permit. While flying the drones, researchers used a reaction scale to assess whale responses, ranging from no reaction to strong reaction, and modified the use of the drones accordingly.

More than 90 mother/calf pairs were recorded at Head of Bight, and a preliminary analysis shows a strong relationship between maternal body condition and calf growth rates. The aim is to monitor the southern right whale population at Head of Bight over four years to quantify changes in their body condition, and how this relates to environmental variables in the sub-Antarctic. This will increase Australian and international understanding about the ongoing health of this population.

Australian sea lion research

Following the success of the whale research, the South Australian Government has used drones to count Australian sea lions along the Bunda Cliffs in the Great Australian Bight as part of a long term sea lion monitoring program. Drone use enabled the detection of previously inaccessible animals, including mothers and pups.

The early results of the sea lion counts showed both a significant increase in numbers and previously unknown locations of animals along the Bunda Cliffs, which greatly improves our understanding of the health of this population.

Research into the protection of breeding sites informs management requirements for these iconic species.



Partnerships

The Government of South Australia has formed a number of different partnerships since the marine parks were proclaimed. The partnerships allow for effective compliance, community engagement, complementary monitoring, and stakeholder and community involvement.

Research partnerships

The monitoring, evaluation and reporting program encourages partnerships and collaborations that enable the program to expand and evolve, providing a more comprehensive evaluation of our marine parks network. There are 10 existing projects with partners including state and federal agencies such as PIRSA and SARDI, research institutions, along with citizen-science and community programs through organisations such as Reef Life Survey and Birdlife Australia. Partnerships assist with conducting marine parks monitoring activities, interpreting monitoring results, and disseminating monitoring information.

In addition to these partnerships, there is a South Australian Government election commitment to provide funding towards partnerships with universities on marine park research. Since 2014/2015, \$240,300 has been approved to finance 12 projects. These projects have aided in building a greater understanding of; baseline ecological data, socio-economic issues around tourism and governance, methods of monitoring marine parks, and of the connectivity of the marine park network.

Compliance partnerships

Partner patrols occur when specific actions are required. For example, in 2015, there was increasing community concern about illegal activity occurring on the Zanoni wreck site. State Government patrols identified a number of boats illegally at the site (inside the protected zone) and a number of offenders were subsequently prosecuted (refer to Zanoni case study on page 17). Offences in marine parks can also be reported to the Fishwatch phone line where non-compliant marine parks activities can be passed on to the compliance team.

Aboriginal and community partnerships

Cultural significance and complementary monitoring are built into the monitoring, evaluation and reporting program. This enables collaboration with both research agencies and community groups through citizen science projects and encourages Aboriginal people, local communities and stakeholders to preserve and share traditional knowledge.

Citizen science projects aim to achieve research, education and engagement outcomes. For example the mullocky tagging and marine fisher survey was a citizen science project conducted in the Yalata indigenous protected area and Far West Coast Marine Park from 2009–2013. The project involved surveying recreational fishers to establish catch and effort, catch composition of target and non-target species, release rate, and population structure and movement patterns of mullocky on the west coast. The project also aimed to promote indigenous stewardship and cooperation with the Yalata Anangu people and the Yalata Land management team. The results from the project are documented in a technical report by SARDI and used to provide advice and baseline information relevant to future monitoring and management of mullocky stocks.

Since 2013/14, there have been 26 citizen science projects around the state. These projects have involved approximately 500 community members and have researched a number of species within marine parks including rock lobsters, cockles and reef systems.



Research collaboration using SARDI research vessel Ngerin



A collaborative effort to create interpretive signage at Point Labatt Sanctuary Zone. The sign depicts the Wirangu Dreamtime story sign of the Wardu (wombat) and Balgurda (seal).



Whale days with Yalata community at the Head of Bight Whale Watching Centre. Children are taught about whale biology, view whales from the boardwalk, as well as through drones used by Murdoch University researchers.



Since 2013/14, there have been 26 citizen science projects around the state. These projects have involved approximately 500 community members.

Case Study: Ocean Eyre

Eyre Peninsula, South Australia, is home to nine marine parks including Thorny Passage Marine Park and the Sir Joseph Banks Group Marine Park. In 2014, a community project began on the Eyre Peninsula titled 'Marine Parks: creating a lasting connection with the ocean', referred to as Ocean Eyre.

Students from three Eyre Peninsula schools were involved in both Aboriginal and western scientific activities. The project aimed to use science, connection and experiences to create advocacy. Activities involved Barngarla cultural sessions, to learn about connection to Country, how Barngarla people used Aboriginal science such as fish traps and astronomy, as well as learning about language, art and making traditional food.

The students were also involved in citizen science projects to survey coastal vegetation and local bird communities, and trained in a Rapid Assessment Method to help survey biodiversity on beaches.

The results from this project made a positive contribution to the marine parks monitoring, evaluation and reporting program by providing baseline information about the coastal flora and fauna within the marine park. Collecting baseline information is important in order to be able to assess changes within marine parks over time.

The project also connected students to the local Barngarla people, creating a greater awareness of how this group use and value the plants and animals in the local area.

This work gave the students a variety of opportunities to learn about their local coastal environment and the plants and animals that live there. Understanding the environment is an important step in creating positive changes in community attitudes towards the coastal and broader environment.



Eyre Peninsula

In summary

This brochure is a summary of South Australia's Marine Parks 5-Year Status Report 2012-2017. The Report marks the half way point towards the 10-year review by 2022.

The Report documents the activities and findings of the program, including early ecological and socio-economic outcomes observed over the first five years.

The program represents the largest ongoing marine biodiversity monitoring program in South Australia's history.

Five years on, our marine parks network is on track to protect and conserve SA's marine life for future generations.

While we have some early findings since marine park implementation, further time will be required for some changes in size, abundance and diversity of biota to become evident.

We will continue to track socio-economic indicators to determine if marine parks are causing changes to local businesses and communities, coastal recreation and fishing, and coastal industries.

The work undertaken to date and summarised in the Report will inform the direction of the marine parks program over the next five years leading up to the legislated 10-year review of the management plans by 2022.

Additional resources

Bryars, S., Page, B., Waycott, M., Brock, D and Wright, A, 2017a, South Australian Marine Parks Monitoring, Evaluation and Reporting Plan, DEWNR Technical report 2017/05, Government of South Australia, through Department of Environment, Water and Natural Resources, Adelaide

Bryars, S., Brook, J., Meakin, C., McSkimming, C., Eglinton, Y., Morcom, R., Wright, A. and Page, B. 2017b, Baseline and predicted changes for the South Australian Marine Parks Network, DEWNR Technical report 2017/06, Government of South Australia, through Department of Environment, Water and Natural Resources, Adelaide

Scholz G, von Baumgarten P, Wilson H, Wright A and Bryars S, 2017, Monitoring, Evaluation and Reporting framework for Marine Parks Program, DEWNR Technical note 2017/06, Government of South Australia, through the Department of Environment, Water and Natural Resources, Adelaide.

Ecological Monitoring

Mcleay, L, McGarvey, R, Linnane, A, Feenstra, J & Hawthorne, P 2017, Rock Lobster survey of the Western Kangaroo Island Marine Park – Cape du Couedic (Sanctuary Zone 3). Report to Department of Environment, Water and Natural Resources. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2017/000282-1. SARDI Research Report Series No. 962. 38 pp.

Socio-economic Monitoring

Fowler, AJ, McGarvey, R, Steer, MA& Feenstra, J.E. 2016, Fishery Statistics for the South Australian Marine Scalefish Fishery: 1983/84 - 2015/16. Report to PIRSA Fisheries and Aquaculture. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2007/000565-11. SARDI Research Report Series No. 935. 48pp.

Web Tools

The Department of Environment, Water and Natural Resources hosts a comprehensive website with detailed maps, descriptions, regulations, and boundary coordinates for South Australia's network of marine parks. It can be found at: www.environment.sa.gov.au/marineparks

Enviro Data SA is the gateway to data and information relating to the science and monitoring of South Australia's environment and natural resources. A range of information sources held or supported by the relevant agencies of the Government of South Australia can be found at: www.data.environment.sa.gov.au



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