

Managing our Big Blue Backyard

The role of marine parks in Australia



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Above - Photo: Kerry Trapnell
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Australia's Big Blue Backyard

Australia is responsible for the third largest area of ocean on Earth. Our waters span the tropical, temperate and sub-Antarctic. We have more unique marine life than any other country in the world.

Healthy marine life is central to our Australian lifestyle, our livelihoods, our global reputation and our regional economies.

More than 85 percent of Australians live by the coast and these oceans are core to our culture and identity as a nation. Not only do we depend on them for food and oxygen, they support our lifestyles and livelihoods. Our coasts are a tourism magnet, attracting visitors from around the world.

They are also a cultural and spiritual focus of many Indigenous communities. For saltwater people, all aspects of social, cultural and economic life are intimately connected to the health of their coastal lands and seas.



Photo: Yotha Kengsuwan

The role of marine parks

Marine parks have been used to manage the marine environment around Australia since the 1980s, and they continue to bring great economic, social and biological benefits to regional communities.

Now in place in waters right around Australia, and in every State and Territory, marine parks are one of the most useful, cost effective and valued scientific tools to manage human impacts on marine life – in particular, the impacts that fisheries management can't manage directly.

Marine parks come in all shapes and sizes, with different zones providing different levels of protection, allowing for a variety of activities. Within marine parks are highly-protected sanctuaries (sometimes called marine national parks), which protect crucial feeding and nursery areas by allowing nature to thrive. As well as increasing the size and number of fish, sanctuaries help build resilience and recovery in the face of growing threats like pollution, introduced diseases and pests, warming waters, ocean acidification and even intense storm activity.

Outside the sanctuaries, healthy fish populations can move into surrounding waters, meaning they also help ensure great fishing into the future.

Recognising connection to Sea Country

Marine parks should recognise and give effect to the important and leading role of First Nations communities in management of sea country and marine life. Increasingly, marine parks are being jointly designed and managed with Traditional Owners which is helping to boost the protection and management of cultural values and practices, and enable the incorporation of traditional knowledge into the management of parks.

Jointly managed parks can create new business opportunities and jobs for advisors, managers, tour operators and Aboriginal Rangers. The design, establishment and management of marine parks needs to be done in a way that is fair and just for Traditional Owners.

What is a marine park and what is a sanctuary?

Alongside good fisheries management, marine parks are the primary tool used to manage Australia's marine environment. Within the boundary of any marine park in Australia there are a range of different zones, allowing for different activities. These include fully protected sanctuary zones (also referred to as marine national parks), recreational fishing zones, no mining areas, and zones that allow different combinations of fishing based on the management objective.

A well-designed marine park has enough sanctuary protection to ensure that part of the ecosystem can operate in its natural state – providing an insurance policy for the future. A mix of the other zoning types throughout the park can support the needs and aspirations of recreational and commercial fishers, as well as recognising cultural values.

Australia's oceans are our greatest natural asset



Photo: Yotha Kengsuwan



Photo: BlueOrange Studio

There is national and international scientific consensus that sanctuaries benefit marine life and bring socio-economic benefits to the community. This report focuses on just some of the more recent Australian examples.

A win-win for conservation and recreation

Well-managed marine parks with sanctuaries have proven to be economically and socially successful, as well as environmentally beneficial. Valuable tourism and recreation industries now flourish in coastal communities around Australia that have marine parks, making them tourism drawcards and bringing significant multiplier benefits to regional economies.

Many of Australia's treasured fishing destinations are within marine parks. In all of the different kinds of waters important to recreational fishers (near urban centres or remote dream fishing locations), marine parks have demonstrated for decades that world-class fishing experiences go hand in hand with science-based marine parks protection.

Investing in our future

Marine parks are not the panacea to all ocean ills, but they are a vital source of replenishment for our global marine life. We now know, from many repeated studies, that preserving and managing these critical spaces is the most effective way to insure our oceans in the face of increasing pressures, and ensure they continue to provide the lifestyle and livelihood benefits all Australians rely on. We also know that surveys consistently show they are supported by the Australian public and the vast majority of recreational fishers.



Photo: Dene Bingham

Sustaining abundance in our oceans

Australia's marine parks are helping to protect, conserve and recover marine life around our entire coastline – from tropical waters to temperate coasts. Coral trout, red morwong, mud crabs, rock lobsters, barramundi and grey nurse sharks are some of the marine animals benefiting from the highly-protected sanctuaries within marine parks. They also protect threatened species and help marine life resist disease, floods and invasive species.

National surveys show more and bigger fish in sanctuaries

A national diver survey in 11 marine parks showed significantly greater numbers of large fish and overall amount of fish inside the 65 sanctuary zones than in nearby fished sites.¹ In older sanctuaries, fish longer than 80 cm were seen approximately 10 times more often than at the fished sites.

A more recent nationwide survey of 73 fished species using underwater cameras found that, on average, the 91 sanctuaries studied had 28 percent greater abundance and 53 percent greater biomass of fished species compared to adjacent areas open to fishing.² The study also showed that the best protection was in sanctuaries designed to optimise connectivity, size and depth range.

Bigger fish are found either far away from human activity or inside sanctuaries

A large scale study using underwater cameras around 10,000 km of Australia's coastline³ showed that larger fish are more abundant further away from human activity, as well as in marine sanctuaries. This included 82 commonly fished species, such as coral trouts or coral groupers, wrasses, morwongs, snappers, emperors, tuskfishes and the popular pink snapper. The findings were consistent across a range of different habitats including tropical reefs and cool kelp forests.



Photo: Glen Cowans



Photo: Stefan Andrews oceanimaging.com

Lobsters rock in marine parks

Rock lobsters are thriving in Australia's marine parks:

- Lobster density was 34 times higher inside than outside sanctuary zones at WA's Rottnest Island, while the density of legal-sized lobsters was 50 times greater.⁴
- Lobster abundance increased up to 20 times in 10 years at Tasmania's Maria Island Marine Reserve.⁵
- Lobsters were 3.5 times more abundant inside than outside Victoria's Point Addis sanctuary, and there were 4.5 times more legal-sized lobsters.⁶
- Lobster abundance was double and overall biomass 3–5 times greater (more and larger lobsters) inside than outside Victoria's Merri sanctuary.⁷
- Lobster abundance was 4.4 times greater and overall biomass 3.5 times greater (more and larger lobsters) inside than outside the Cape de Couedic sanctuary at Kangaroo Island, South Australia.⁸ Before the zone was created, there were no differences.



Coral trout respond to protection

Using Great Barrier Reef Marine Park data spanning 1983 to 2012, scientists discovered the size and abundance of coral trout were greater in sanctuaries than in fished areas.⁹ Numbers in the sanctuaries doubled since the 1980s, and after a severe tropical cyclone, a reduction in numbers only occurred in the fished areas. There was also no evidence that displaced fishing effort had reduced fish populations on fished reefs.

Barramundi benefits to unfished estuaries

A comparison between Cairns and Mackay fished and unfished estuaries found catch rates were 3.7 times greater for barramundi in the unfished areas.¹⁰ Catch rates for juvenile sharks were 4.4 times greater and queenfish 2.9 times. Barramundi egg production was 21 times greater in the unfished estuaries, whereas in fished areas it was close to zero.



Photo: Charlotte Klose

Dispersal of fish outside sanctuaries

DNA fingerprinting technology was used to follow the dispersal of juvenile fish in the Great Barrier Reef Marine Park.¹¹ The analysis revealed a direct link between juvenile coral trout and stripey snapper found outside sanctuary zones with adults remaining inside the zones. The data showed that 83 percent of coral trout juveniles and 55 percent of stripey snapper moved into fished areas, with some travelling as far as 10 km. Although the sanctuary zone reefs represented just 28 percent of the local reef area, they produced half of the juvenile fish.

Rock lobsters and their larvae could also be spilling across the boundary into fished areas from the Merri Marine Sanctuary¹² and Point Addis Marine National Park in Victoria.¹³ Lobster numbers just outside the Point Addis boundary were higher than further into the fished area, suggesting spillover may be occurring.



Mobile shark species spend plenty of time in marine parks

Scientists reported on the movements of juvenile pigeye and adult spottail sharks in two conservation park zones in the Great Barrier Reef Marine Park.¹⁴ Recreational fishing is allowed within the zone but not trawling and netting. Although the two sharks are both mobile species, they spent long periods – on average 22–33 percent of their time – within the conservation park zones. Some even stayed for 600 days. The scientists concluded that the zones protected the sharks across different parts of their life stages.

Fewer crown of thorns starfish in protected coral reefs

Outbreaks of the invasive crown of thorns starfish have led to significant losses of coral cover in the Great Barrier Reef Marine Park. However, the starfish impact has been less in sanctuaries. At least 18 tropical fish species have been identified as predators of the starfish, including the spangled emperor, blackspotted puffer, neon damsel and blackspot snapper.¹⁵ Fish numbers were higher in the sanctuaries and by eating more starfish, they reduced the effect of the outbreak.



Photo: Nigel Marsh

'Babies being produced in the reserve are not staying there, they are being dispersed out. So, we're getting benefits across a range of areas as a result of what we're doing within the reserve.'³⁷

David Williamson, James Cook University, on the benefit of sanctuary zones in the Great Barrier Reef Marine Park.

Coral disease lower in sanctuaries

According to scientific monitoring, corals in the Great Barrier Reef Marine Park sanctuary zones in the Whitsunday Islands were more resistant to disease than in fished areas.¹⁶ In fact, there were four times fewer coral diseases inside the sanctuary zones. The smothering of corals after seabed disturbance, and injuries caused by boat moorings and lost fishing line, were the main factors encouraging coral disease.

Coral reefs in sanctuaries recover quickly after floods

Devastating floods smothered the inshore coral reefs of Queensland's Moreton Bay Marine Park in January 2011. Marine algae can rapidly grow on reefs covered in sediment and outcompete with coral for space. A survey of 10 reefs, four in sanctuary zones and six in fished areas revealed that coral reefs in sanctuaries recovered faster than those in fished areas.¹⁷ The sanctuaries had more fish, including parrotfish, surgeonfish and rabbitfish, that grazed on the algae before it could take hold.

Marine life recovery in Moreton Bay

Monitoring studies of fish and mud crabs in Queensland's Moreton Bay Marine Park showed that:

- Catch rates and the weight of snapper increased rapidly after the park's 2007 rezoning increased sanctuary protection. Average amount of snapper, spangled emperor, redthroat emperor, blackspot tuskfish, maori rock cod and goldspot wrasse also increased within three years of the rezoning;¹⁸
- Snapper catches were 10 times higher in one of the new sanctuary zones than in fished zones, yellowfin bream catch rates were up to seven times greater and flathead catches also higher;¹⁹
- Numbers of rabbitfish and emperor species were greater in seagrasses protected by sanctuary zones;²⁰
- Catch rates of male mud crabs in one of the sanctuary zones were 4–17 times that of fished zones.²¹

Emperors reign at Ningaloo

Researchers reported that the abundance and size of spangled emperor, redspot emperor, yellowtail emperor and grass emperor were significantly greater in Ningaloo Marine Park's sanctuaries.²²

Rottneest more than just quokkas

After 16 years of protection, data analysis revealed the abundance of West Australian dhufish and breaksea cod were greater inside than outside the Kingston Reef Sanctuary at Rottneest Island.²³ Dhufish abundance was 10 times greater inside the sanctuary, while the amount of the breaksea cod was 3.2 times higher.



Photo: Bluebottlefilms

Protection good for tropical and temperate fish

Baldchin groper, sweetlip emperor, spangled emperor, Australasian snapper and coral trout were on average 48 mm longer in the sanctuary zones of Houtman-Abrolhos Marine Park in Western Australia.²⁴ In later research, coral trout numbers in the park's sanctuaries were double that of fished areas.²⁵ Further, 51 percent of coral trout in the unfished areas were longer than the minimum legal length, compared with 1.8 percent in the fished areas.

Fish and abalone more abundant in Batemans sanctuaries

Five years after the creation of NSW's Batemans Marine Park, research revealed that fish abundance was 38 percent higher in sanctuaries than in partially protected areas.²⁶

Furthermore, a longer-term study over 10 years in Batemans Marine Park showed that sanctuary areas were able to maintain greater stability in species composition, compared with partially protected and unprotected areas.²⁷ In particular, the ability of sanctuaries to retain species that are commonly targeted by fisheries was 4–6 times greater compared with partially protected and unprotected areas. Partial protection offered little to no improvement in stability, compared with unprotected areas. Stability in species biodiversity is important to support ecosystem function. These sanctuaries may, therefore, support biodiversity resilience under ongoing environmental change.

Another analysis found red morwong and abalone were more abundant in sanctuaries than in partially protected areas in Batemans Marine Park.²⁸

Fish on the rise off Port Stephens

After eight years of protection, snapper numbers and size had increased in the sanctuary zones of the Port Stephens-Great Lakes Marine Park in NSW.²⁹ The researchers concluded that the park was an important refuge for snapper. From another study, it was reported that the numbers of wrasse, scorpionfish, sea bream, leatherjacket and morwong species had increased in sanctuary zones when compared with fished areas outside the park.³⁰



Photo: Shannon Conway

Increasing abundance at Solitary Islands

Targeted snapper, grey morwong, pearl perch and venus-tuskfish were found to be more abundant and larger in sanctuary areas of the Solitary Islands Marine Park in NSW after 14 years of protection.³¹ In other research, mud crabs were more abundant and larger than crabs outside the park's sanctuary zones.³² Some of that increase spilled into fished areas. An eight-year study revealed that giant mud crab numbers were 2–3 times higher in the unfished parts of the park's estuaries.³³

Marine parks protecting grey nurse sharks

Conservation of the critically endangered grey nurse shark on Australia's east coast is supported by marine parks. Each of the shark's 19 critical habitats, as well as several other important sites, are now protected within marine parks. The network of protected aggregation sites is very important for the sharks when they seasonally migrate between NSW and Queensland. Researchers discovered that juvenile and sub-adults were re-establishing themselves at a previously abandoned aggregation site in Jervis Bay Marine Park.³⁴ As a result, one dive operator had increased his visits there fourfold.

NSW marine park networks have more and larger fish

A study across the NSW marine park network in 2011 showed there were a greater number of fish in the 18 shallow reef sanctuary zones studied, and more larger fish, especially in older sanctuaries and deeper reef areas.³⁵

A follow-up study in rocky reef sites across the NSW marine park network in 2010–11 and 2015–16, showed an overall increase in abundance of pink snapper of over 150 percent over the two periods in the 27 sanctuaries studied.³⁶ In contrast, pink snapper numbers in partially protected or unprotected areas either showed no change or declined. There were also smaller increases in numbers (about 11 percent) seen inside sanctuaries for other commonly fished species, especially those that tend to stay in one site, such as wrasses and plankton-eaters like silver sweep.



Photo: Dene Bingham



'As far as sanctuary zones go, you are very rarely giving up much.

For me, it's an insurance policy to have an area that's natural and allows us to understand what a natural process is so we can better manage the vast majority of the area which we are actually fishing in.'³⁸

Neville Barrett, University of Tasmania.

Marine parks and fisheries management: A winning combination

'Sustainable fisheries management, together with sanctuary zones, offers a 'two-tool toolbox' to the sustainable management of our oceans.

'The prime purpose of marine parks is the conservation of species, communities, habitats and ecosystems. Fisheries management tools are effective in increasing the catch of targeted fish. However, they cannot match the performance of sanctuary zones in the conservation of the wider marine environment. This is because the focus of most fisheries management is largely on single species and not the wider ecosystem.

'Networks of highly protected sanctuaries benefit fisheries management by:

- Providing resilience to large scale environmental pressures such as flooding and climate change;
- Providing the best scientific tool for distinguishing the effects of climate change from fishing;
- Providing proven and cost-effective benefits for fisheries seeking to secure the marketing advantages of third-party sustainability certification;
- Improving the 'social licence to operate' of commercial fisheries among Australian consumers.'

David Booth, Professor of Marine Ecology at the University of Technology Sydney



Boosting local economies

The Australian Institute of Marine Science's Marine Index³⁹ estimated that in 2015-2016, marine-based tourism generated income of more than \$30 billion, recreational fishing \$2.2 billion and commercial fishing and aquaculture \$3.3 billion. The marine environment is a powerhouse in the Australian economy, and marine parks can help secure its ongoing contribution to lifestyles and livelihoods.

Marine parks are the workplace for commercial fishers, charter fishers, tour guides, boat hirers, surf schools and the owners and staff of dive, fishing, whale watching and sightseeing companies. Each generates income for themselves and their regional communities, and all depend on the good health of their marine environment.

Valuable tourism and recreation industries now flourish in coastal communities around Australia that have marine parks, boosting tourism and bringing significant multiplier benefits to regional economies.

Recreational value of marine parks

Marine parks have many recreational uses that include fishing, swimming, surfing, sailing, whale watching and diving. Estimates of the recreational value were made for four NSW marine parks in 2007.⁴⁰ They were based on travel costs and annual visitor numbers of 52,000 for Batemans Marine Park, 40,000 for Cape Byron, 58,000 for Jervis Bay and 32,000 for the Solitary Islands. The estimated recreational value for each was up to \$2.5million for Cape Byron, \$1.9million for Jervis Bay, \$1.6million for Batemans and \$1.4million for Solitary Islands.

NSW businesses boom thanks to marine parks

'While there have not been any quantitative studies on the effect of the marine park on tourist-based businesses in Huskisson, all operators feel it is positive for their businesses,' said Huskisson Chamber of Commerce president Tony Lim.

Jervis Bay Sea Sports owner said the marine park had made a huge difference to life in the Jervis Bay waters with divers spotting more fish, bigger fish, and more juveniles, particularly in the sanctuary zones.

Dolphin Watch cruises said that the marine park had transformed the region with a huge benefit to the entire region, and noted a large increase in the number of whales entering Jervis Bay to rest while other forms of marine life had also increased in numbers. That all added up to more tourists and more business for local outlets.

The Shoalhaven tourism manager said the marine park helped create 'a very positive tourism experience' and that benefits also spread to things such as recreational fishing. He said that visits to the region's boat ramps also showed many anglers were catching the bag limits when fishing in the bay, 'and they're catching good sized fish, which creates a good impression.'⁴¹

Ningaloo Marine Park protects tourism

In the 10 years since Ningaloo Reef became one of the most highly protected marine areas in Australia, it attracts an impressive 180,000 tourists a year, who spend more than \$140 million. For merino grazer Leonie McLeod from Warroora Station, it's her home, livelihood and passion: 'I've had a fairly good look around the world and I've noticed that there are no places still as wild and beautiful adjacent to a pristine coral reef anywhere ... It's what people are seeking from all over the world. They just want to see something natural. We don't believe we own anything. We just believe we are caretakers here and I'd like to pass that on to my little bush chook [grandchild]!'.⁴²

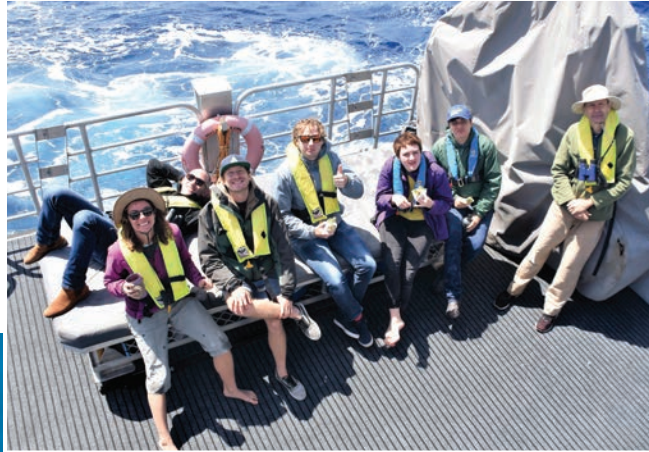
Photo: Oceanwideimages.com



It has been estimated that over a 24-year generation, each of the 400 whale sharks that visit Ningaloo Marine Park is worth \$282,000 to the regional economy.⁵¹

Shark diving in marine parks

The annual direct expenditure of shark divers in Australia has been estimated at more than \$25 million each year comprising: whale sharks in Ningaloo Marine Park \$11.5 million; white sharks in the Neptune Islands Marine Park \$7.8 million; grey nurse sharks in NSW and Queensland marine parks \$4.2 million; and reef sharks at Osprey Reef in the Coral Sea Marine Park \$1.9 million.⁴³ Regional expenditure on accommodation, travel and other activities for whale shark tourists at Ningaloo was \$12.5 million and \$8.1 million in Port Lincoln (for Neptune Islands).



On the lookout for whales

Whale watching has become a very popular activity for Australian and international tourists at places like Ningaloo, Warrnambool, Sydney and Hervey Bay. In 2018 it was estimated that 49,000 people joined whale watching/scenic cruises in the Jervis Bay Marine Park.⁴⁴ A 2005 economic analysis estimated that whale watching at Hervey Bay was worth between \$6.4 million and \$11.4 million of regional income.⁴⁵ A 2006 survey found that the Hervey Bay visitor experience would be damaged, 23 percent of visitors would spend less time in Hervey Bay, 41 percent would go elsewhere, and local businesses might close if whales no longer visited the region.

Watching manta rays

An economic analysis of manta ray watching in Australia estimated an annual tourist expenditure of \$6.5 million and a direct economic impact of \$14.5 million.⁴⁶ Along the Ningaloo Reef, manta rays are sanctuary zone regulars and their cleaning stations are a thoroughfare for a broad range of species.

An economic analysis revealed that the management of Shark Bay Marine Park supported 36 direct and indirect jobs, while visitors supported 247 direct and indirect jobs.⁵²



Photo: OceanwideImages.com

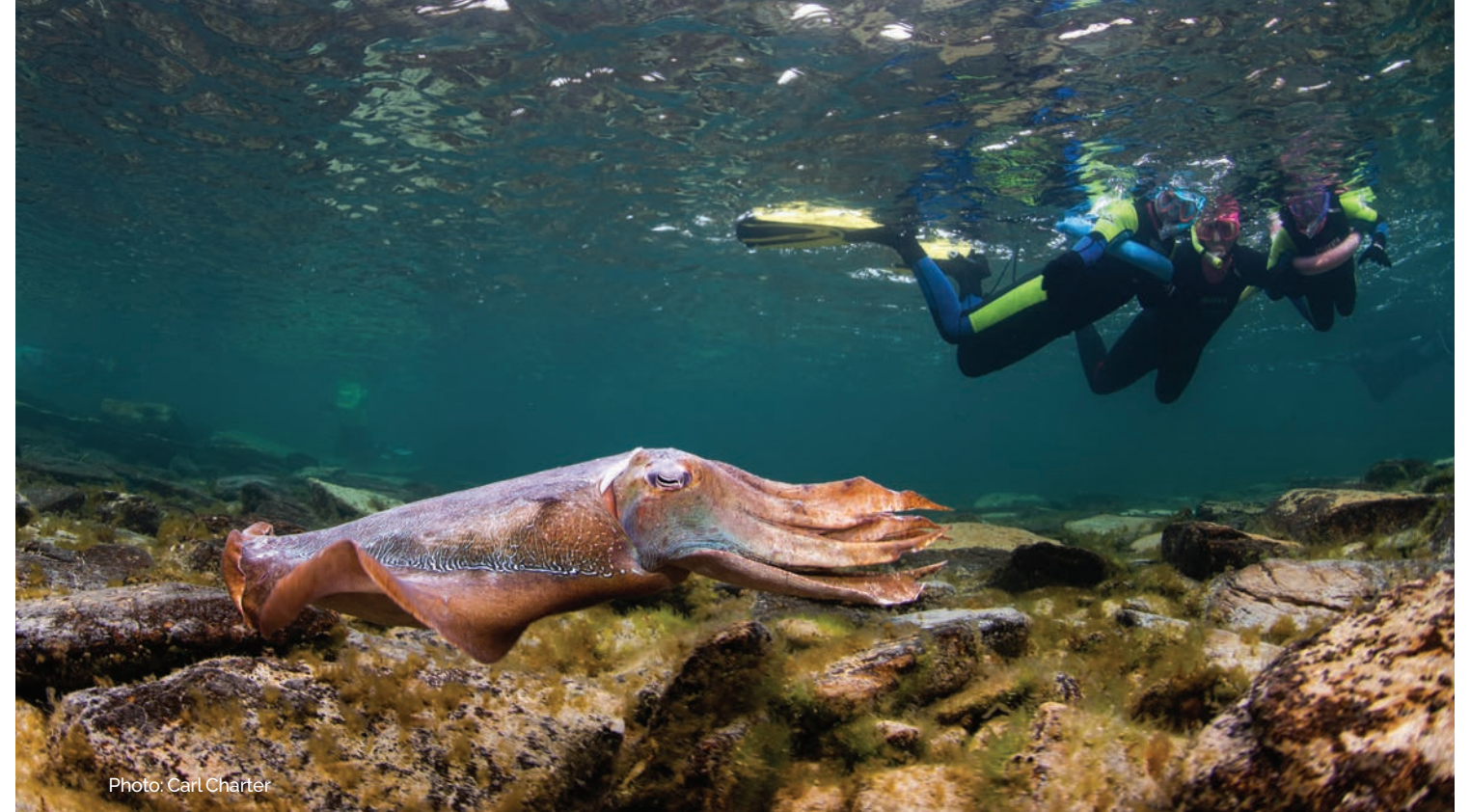


Photo: Carl Charter

Exploring marine sanctuaries in South Australia

When South Australia established its network of marine parks in 2014, the state government was keen to see people get out and explore their underwater world. To support that, government funding was given to the not-for-profit Explore Marine Sanctuaries, which has a focus on community snorkelling activities. Founder of the group, Carl Charter, said that 'one of our most successful programs is Cuttlefest. We began it to give snorkellers a close-up experience with the giant Australian cuttlefish living in the Upper Spencer Gulf Marine Park near Whyalla. An economic assessment of the event estimated it was worth between \$24,000 and \$36,000 to the local economy.'

Bottlenose dolphins attract tourists to Shark Bay

More than 100,000 visitors each year go to WA's Monkey Mia in Shark Bay Marine Park to feed a small group of bottlenose dolphins.⁴⁷ In 2005 it was estimated that they contributed between \$5.5 million and \$11.5 million per annum in direct expenditure to the local economy.⁴⁸ The economic analysis also showed that residents along the Gascoyne coast were dependent on wildlife icons for their livelihoods. A 2006 survey found that without the dolphins, visitor satisfaction would drop, local businesses and jobs would be affected and tour operators might cut Monkey Mia from their itineraries.⁴⁹

Penguin protection has tourism benefits

Victoria's Middle Island, surrounded by the Merri Marine Sanctuary, is home to a colony of little penguins and now the focus of the Middle Island Project. The project protects the penguins from foxes using eight maremma dogs made famous by the hit film *Oddball*. As well as providing jobs, there are other ways that the project contributes to the local economy. A 2019-2020 summer survey of 245 Warrnambool locals and visitors by Deakin University's Shelby Schumacher revealed

that 20 percent of visitors came to Warrnambool because of the penguins and the Middle Island Project.⁵⁰ They also ranked the work being undertaken to conserve the penguin population as being of a 'high level of importance'. Using just fuel costs and ticket prices for the shoreline tour, Shelby estimated that visitors contributed more than \$200,000 to the local economy each year. The figure would have been far higher if accommodation, food and other costs had been included.

Merri diving

It's 40 years since Sally Watson first dived into the waters surrounding Middle Island at Warrnambool in south-west Victoria. Back in 1980 the underwater view was very different from today – there were far fewer fish. What's changed? The area is now the Merri Marine Sanctuary. Sally is now a scuba dive instructor with local dive company Daktari. She says that divers come to Warrnambool because of the sanctuary and would go somewhere else without it. 'Over summer we run three snorkel tours with 10–20 divers in the sanctuary each week in January. It's teeming with fish and some come right up to your face mask. Rock lobsters grow up to 5 kg or bigger. They become the breeders that add to the stock for the lobster fishers, who at times line their pots up along the sanctuary boundary. They're getting heaps more catches than they ever did before the sanctuary was created.'

The economic, social and icon asset value of the Great Barrier Reef Marine Park was estimated to be \$56 billion in 2017.⁵³ In 2015–2016 the marine park supported 64,000 jobs and added \$6.4 billion to Australia's economy. Tourism was valued at \$5.7 billion, commercial fishing and aquaculture at \$199 million, recreational activities at \$346 million and reef-related scientific research at \$182 million.

Ensuring great fishing into the future

Marine parks are tourism powerhouses, supporting a range of growing industries in regional communities and helping to put them on the map as iconic tourism destinations.

Many of Australia's treasured fishing destinations are within marine parks – places like Ningaloo Reef, the Solitary Islands and right along the Queensland coast. In all of the different kinds of waters important to recreational fishers (near urban centres or remote dream fishing locations), long-standing marine sanctuaries are working hand in hand with world-class fishing experiences.

For the commercial fishing sector, marine parks can support achievement of sustainability standards that can secure access to new markets or increase catch in existing markets. For those whose livelihoods are impacted by the creation of a marine park, payment of fair and reasonable compensation must be provided.

Marine parks can also provide an important cost effective management tool to manage the ecosystem effects of fishing, which is becoming increasingly a requirement in Australia.

Recreational fishing value increases from marine park

The rezoning of Moreton Bay Marine Park in 2007 increased the area of sanctuary zones and removed trawl fishing from parts of the park. An economic analysis showed that these changes may have added from \$1.3 million to \$2.5 million in economic benefits to the bay's recreational fishing sector, which was valued at \$20 million each year.⁵⁴ The researchers also concluded that the cost of compensation for commercial fishers could be seen as being covered by the increased value of recreational fishing.

Top End fishing adventures

Hugh and Aaron Gange run Venture North Safaris in Darwin to provide visitors with an authentic outback Territory experience: 'The jewel in the crown of what we offer tourists is our fishing safaris and Port Essington camp in Garig Gunak Barlu National Park. These near-pristine tropical waters are a paradise for recreational fishers and the ideal destination for those looking to catch quality sport fish without the crowds. The waters at our camp are free of almost all commercial fishing, and prawn trawling is excluded from most areas of the park. Our clients come to the Top End from all around the world to solely fish these waters.

There are no other areas in the Top End where guided fishing tour operators and their clients have such a high degree of certainty of catching big fish. For our company to flourish, we need the Top End coasts and seas to be healthy and productive. If our clients can't catch fish, they won't come back to the Top End and tourism will suffer'.

Benefits to charter fishing

Phillip Younis has been operating his charter boat before and since the creation of the Twelve Apostles Marine National Park and the Arches Marine Sanctuary. Due to the limited number of suitable days for diving and fishing, and the lack of visitor awareness about the protected areas, he hasn't seen an increase in the number of recreational fishers and divers. However, he has seen a big boost to marine life. 'For biodiversity there's no question, there has been a huge benefit since the marine national park was created. There's more fish, abalone are as big as dinner plates and rock lobsters average 2–3 kgs.'

When the park was established I lost a couple of gummy shark fishing spots where I used to take people. But there's been no reduction of flathead or snapper catches and two of my other fishing spots outside the boundary have improved. I reckon that's because of fish spillover, which is also why the rock lobster fishers set their pots along the park boundary. They wouldn't do that unless there's lobsters coming out of the park.'

Economic review of SA's sanctuaries

The South Australian Government commissioned a comprehensive review of the social and economic effects of sanctuary zones in that state's marine parks. The 2018 report by EconSearch found that five key commercial fisheries had all experienced reductions in catch over the 10 years before the parks were created in 2014. 'These declines are due to a range of factors including changes in environmental conditions, market conditions, interannual fluctuations in stock biomass and fisheries management changes... It should be noted that Abalone, Sardine and Marine Scalefish Fisheries have experienced increased catch/effort in the period since 2014, further underscoring the relative unimportance of marine park zoning in the trends in these fisheries.'⁵⁵

The EconSearch review also examined socio-economic trends in coastal towns near the sanctuary zones, concluding that they had not been affected. It found the same for recreational fishing.

The review found that the marine parks and sanctuaries were in fact bringing many benefits to marine life and regional communities including that rock lobsters have grown larger and are more abundant inside Kangaroo Island's Cape du Couedic sanctuary zone; sanctuaries were critical and effective at protecting long-lived, site attached vulnerable species; and offshore sanctuaries were biodiversity hotspots and important science reference sites.



Photo: Venture North



Fish prices not affected by sanctuary zones

When South Australia established its 19 marine parks and their sanctuary zones in 2014, concerns were raised that consumers might have to pay higher prices for locally caught fresh fish. However, a three-year fish price monitoring study of King George whiting, garfish and yellowfin whiting fillets, and whole snapper, snook and calamari, found no evidence of price increases.⁵⁶

Hooked on diving

Nigel Hayward never thought much about the impact he had on the ocean as a fisherman until the day he went diving. He worked on a fishing trawler for two years before he left to become a dive instructor at 'Let's Go Adventures' in Port Stephens-Great Lakes Marine Park, NSW.

Today Nigel still loves fishing, and says areas outside the sanctuaries are good for fishing. 'The fish have to come in and out of the sanctuaries sooner or later and there's your opportunity to catch them. It's definitely our job as parents and as fishermen – that our children and their children can enjoy the sport of fishing – that we educate everyone on the importance of sustainable fishing and marine parks.'

The Rocky Barra Bounty

Rockhampton and Yeppoon fisherman Bill Sawynok's fish tagging competition, The Rocky Barra Bounty, has become one of the premier barramundi competitions in Queensland and contributes to local research. Since the 1990s, Bill has trained his fishing group to target and collect data on many fish species. It was his group's data that contributed to the design of the sanctuary zone off Yeppoon in the Great Barrier Reef Marine Park.

Bill says that fishing is vital to his community and there was originally some hesitation when the Great Barrier Reef Marine Park was rezoned in 2004. 'But the local community here really took it into their own hands and that led to the community making its own decisions about where it thought the sanctuary zones should be located. Sanctuary zones play an important role in looking after our fish resources. If nothing else, they act as an insurance policy. If things do go wrong, and if we do run into problems with the resources that have nothing to do with fishing but something to do with climate change or long droughts, they have a role in ensuring we've got some level of fish stocks that are protected.'

Photo: Charlotte Klose



Widespread community support for marine parks

Marine parks around Australia have become a source of pride for regional communities. Many people who once opposed marine parks now love them, and many surveys have shown they have widespread support, including among the overwhelming majority of recreational fishers.

Surveys have consistently shown strong community support for marine parks:

- Of 2000 NSW people surveyed, 85 percent agreed that some areas of the oceans should be protected in marine parks;⁵⁷
- A majority of Brisbane residents agreed that marine parks help sustain fishing and the fishing industry, while in regional areas people nominated enhanced tourism opportunities as a further benefit of marine parks;⁵⁸

Surveys in three NSW marine parks discovered that:

- 84 percent of the community were in favour of conserving the Jervis Bay Marine Park, while 82 percent supported sanctuary zones (76 percent of fishers);⁵⁹
- 87 percent (fishers 82 percent) supported conserving Solitary Islands Marine Park and, on average, 80 percent supported sanctuary zones;⁶⁰
- 91 percent of residents and 96 percent of visitors supported the Lord Howe Island Marine Park sanctuary zones (90 percent fishers), and 96 percent of residents and 98 percent of visitors supported the broader marine park;⁶¹

- In South Australia, a 2020 survey found statewide support for marine sanctuaries at 88 percent, with support strongest among those who identified as fishers at 90 percent;⁶²
- A 2019 Victorian survey by Ipsos reported that 80 percent of respondents thought the state's coast and marine environments were its most important natural features.⁶³ Over the past three Ipsos surveys, five years apart, support for sanctuary zones has grown from 91 percent to 95 percent.

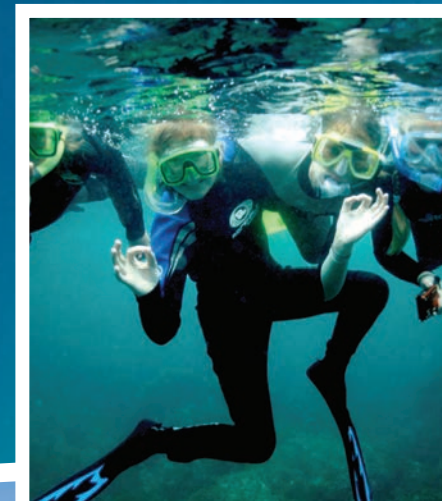
'Since the sanctuary was created we've had a series of festivals, events and projects that have built powerful environmental messages. No-one wants to live or visit a degraded and polluted beach. The sanctuary and other coastal management activities are protecting the area's natural values and that is why people visit and want to live here.'

John Duthie, Friends of The Bluff Barwon



"We live on the veranda of the world's greatest island. It's our birthright to have a clean ocean, to catch a feed, to interact with nature. And, like any birthright, we have to safeguard it."

Tim Winton, Author

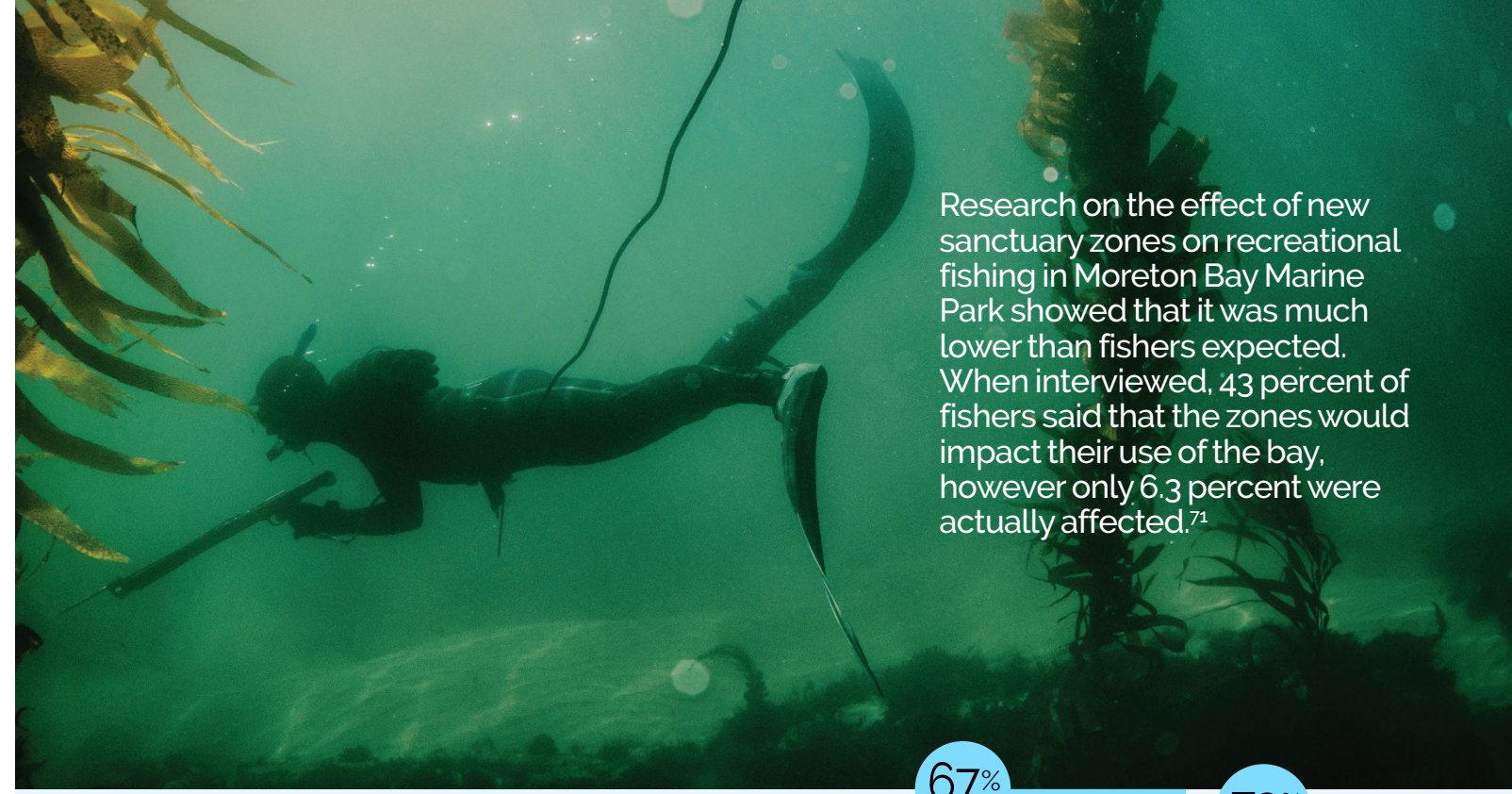


Recreational fishing support for marine parks

Published scientific and government surveys of fishers consistently show the vast majority support marine parks and their sanctuaries, particularly once they have experienced them first hand:

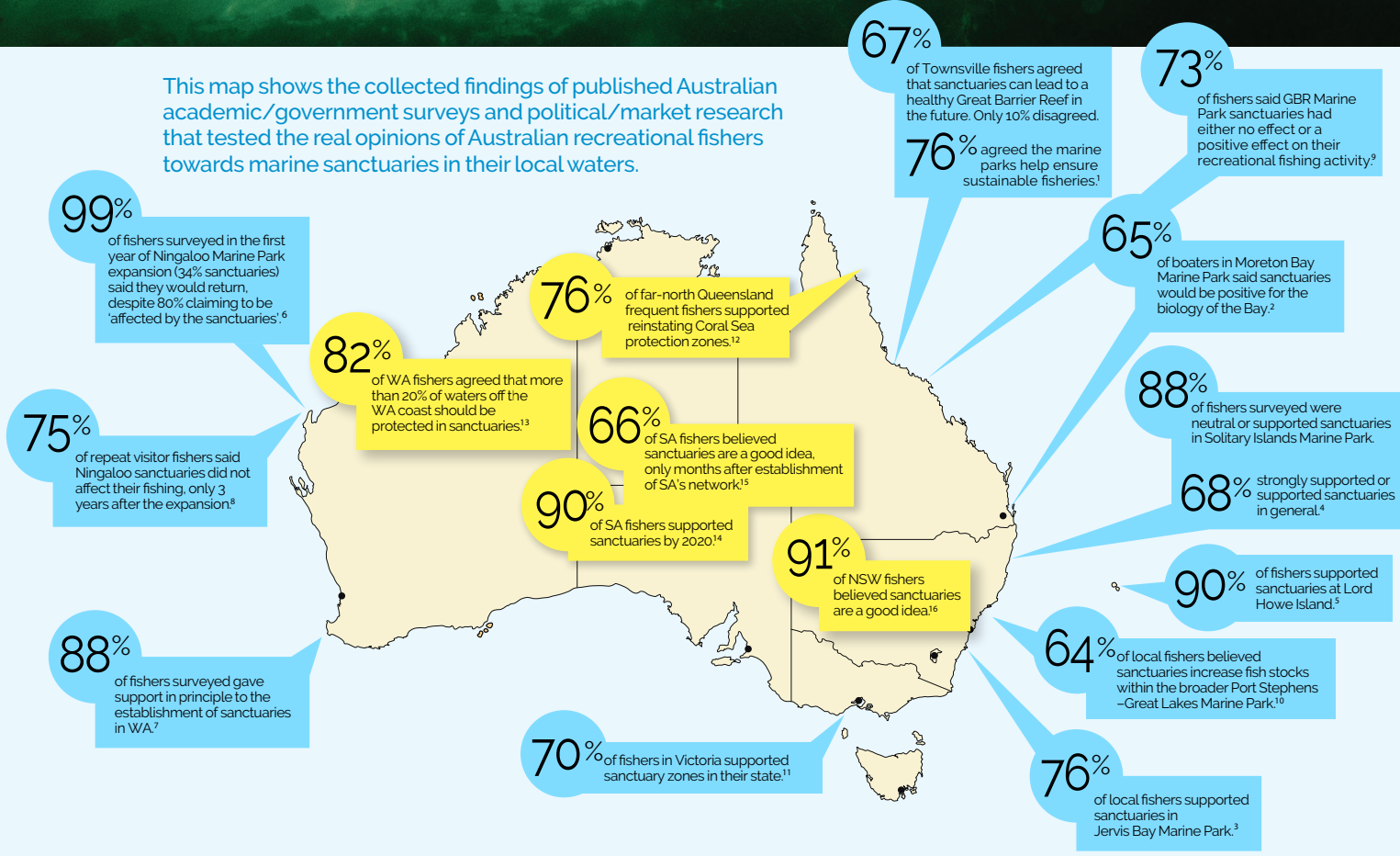
- Three years after sanctuary-level protection of the Great Barrier Reef Marine Park was increased to 33 percent in 2004, a survey of recreational fishers discovered that the majority believed the rezoning was necessary and had little impact on their fishing;⁶⁴
- A 2009 Essential Research poll revealed that 76 percent of respondents who fished at least once a month supported having 30 percent or more of the ocean areas free of fishing and mining;⁶⁵
- In 2020, a South Australian survey showed statewide support for sanctuaries at 88 percent, with 90 percent support among those who identified as fishers;⁶⁶
- Almost two-thirds of recreational fishers surveyed in 2016 supported the Port Stephens–Great Lakes Marine Park six years after its implementation, compared with 12 percent prior to the park's creation;⁶⁷
- A Victorian survey showed that 70 percent of fishers supported sanctuary zones in that state.⁶⁸

In a 2017 survey of recreational fishers, interviews were conducted in 10 marine parks in Western Australia, South Australia, Queensland and New South Wales.^{69, 70} On average 63.3 percent of fishers supported sanctuary zones in their marine park, while 17.8 percent were opposed. Fisher support increased with the age of the sanctuary zone, rising to 72 percent support for areas more than 10 years old (only nine percent opposed). The majority (78 percent) thought sanctuaries benefited the marine environment, while 73 percent believed they had no impact on their fishing (most said there was no change in their fishing since the zone was created). Sanctuary zones in Ningaloo Marine Park had the highest fisher support, followed by the Great Barrier Reef, Moreton Bay, Jervis Bay and Solitary Islands Marine Parks.



Research on the effect of new sanctuary zones on recreational fishing in Moreton Bay Marine Park showed that it was much lower than fishers expected. When interviewed, 43 percent of fishers said that the zones would impact their use of the bay, however only 6.3 percent were actually affected.⁷¹

This map shows the collected findings of published Australian academic/government surveys and political/market research that tested the real opinions of Australian recreational fishers towards marine sanctuaries in their local waters.



Academic/Government study sources:

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Climate change and marine parks

Like a canary in a coalmine, the oceans are sounding a warning about climate change. Increasing water temperatures, storm activity and runoff, the recent devastating loss of mangroves in the north and kelp forests in the south and coral bleaching are all signs that marine life is facing an uncertain future. These changes come at a time when marine vertebrate populations have been reduced by 50–95 percent, and seagrass, mangroves and coral reefs are declining by one percent each year.^{72 73}

Marine parks are critical in building the resilience of marine life to climate change – building the health of the marine environment to allow it to cope better with climate change impacts. This was acknowledged by a CSIRO report card on marine climate change: 'Adaptation options for marine climate change need to focus on conservation responses to increase resilience of our marine biodiversity as well as adapting our businesses and practices.'⁷⁴

Sanctuary zones stabilise reef communities

Coral bleaching events in the Great Barrier Reef Marine Park have increased concerns about its future. However, an analysis of 20 years of data has shown that the park's sanctuary zones increase the resilience of marine life to coral bleaching, coral disease, crown-of-thorns starfish outbreaks and cyclones.⁷⁵ The scientists found that reef community composition was more stable in the sanctuary zones, the magnitude of disturbance lower and recovery faster than in fished areas.

Climate-resilient design for marine parks

A review of Ningaloo Marine Park's sanctuary zones found that areas of deeper and cooler water were more resilient to climate change than intensively used shallow waters.⁷⁶ However, the review also determined that the deeper habitats were poorly represented in sanctuary zones. It concluded that increasing the protection levels of deeper habitats would increase the park's resilience to climate change.

Blue carbon worth billions

Seagrass meadows store carbon in the seabed and their conservation is critical to mitigating climate change. At 4000 km², the seagrass meadows of Shark Bay Marine Park are the largest in the world and their carbon store estimated at 350 million tonnes.⁷⁷ That would be worth \$3.5 billion per year based on a \$10 per tonne carbon price.

Conserving sharks should also be a priority for protecting blue carbon stores, according to recent research by Deakin University.⁷⁸ It found that sharks and other top-order predators control the number of plant-eating animals such as green turtles. If sharks are overfished, then excessive grazing could lead to a loss of seagrass cover and the release of stored carbon.

Restoring the balance

Since the 1970s, long-spined urchins have been travelling south from NSW to Tasmania on a warming East Australian Current. On arrival they invade and then overgraze kelp forests. Southern rock lobsters are the urchin's natural predators. However, fishing has reduced their stocks to a point where they cannot reduce the urchin numbers. Research showed that sanctuary zones had more rock lobsters and of a larger size that could prey on the urchins.^{79 80} As a result, urchin survival rates were far lower, mortality rates higher and kelp forests more resilient inside the unfished zones. By restoring the balance to kelp forests, the sanctuary zones are allowing marine life to resist a major impact of climate change.



Photo: Attila Kaszo

Fish on the move down WA's coast

Climate change is pushing tropical fish to the cooler waters of higher latitudes. In WA, a team of scientists used published data and their expert knowledge to predict changes in the range of 30 tropical, subtropical and temperate fish, mollusc and crustacean species along the west coast.⁸¹ They estimated that on average, each decade the animals would move southward by 19 km and go deeper by nine metres. By 2055, the range of the baldchin groper could shift by 78 km, the blue swimmer crab by 205 km, the greenlip abalone by 320 km, the gummy shark by 597 km and the Australian herring by 818 km. The loss of species would be highest from the warmer waters of the north coast, while gains would be greatest along the cooler south coast and offshore waters. The scientists concluded that 'climate

change would further raise the urgency to ensure sustainable management of fisheries and marine ecosystems. Moreover, instead of assuming that the ocean is relatively stable, multiple long-term scenarios of ocean changes should be considered in designing new policies or reviewing existing management measures, and proactively increasing ocean resiliency through, for instance, the establishment of marine protected areas.'

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