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Secretary, Select Committee, Marine Parks in South Australia
Legislative Council
Parliament House
GPO Box 572
Adelaide SA 5001

Sent by email to:
guy.dickson@parliament.sa.gov.au

Dear Mr. Dickson

As the peak conservation body for South Australia, the Conservation Council of South Australia (CCSA) welcomes the opportunity to provide comment on the Inquiry by the Select Committee into Marine Parks in South Australia.

CCSA is an independent, non-profit and strictly non-party political organization representing over 50 of South Australia's environment and conservation organizations and their 60,000 supporters.

CCSA developed, in 2009, a comprehensive view of environment policy in "South Australia in a Changing Climate: A Blueprint for a Sustainable Future" (<http://www.conservationsa.org.au/blueprint.html>). This document sets out, at a strategic level, policy positions in six key environmental areas. CCSA's Blueprint sets out its vision for the coast and marine areas of South Australia in pages 28 to 38 and (on pages 33 and 34) explicitly refers to the importance of marine parks in ensuring the long-term security of South Australia's marine environment.

At the outset, CCSA congratulates the Government on the marine parks initiative. CCSA is convinced by the weight of scientific evidence, that a network of well designed marine parks with a core of highly protected, comprehensive, adequate and representative sanctuary zones is the best approach to reduce the current risks to marine biodiversity. An approach

such as this has the best chance of providing an efficient and cost-effective strategy to protect our marine biodiversity from multiple, cumulative, known and unknown threats. Its success is important to South Australia's future in many ways, including:

- **Securing the future:** the initiative will assist in securing the future for the many unique species that inhabit South Australia's waters.
- **Climate Change insurance:** establishing marine parks should be seen as one of the arms of South Australia's response to the challenge of climate change. By ensuring the existence of sanctuary zones, in particular, there is likely to be a higher probability that marine species and ecosystems will be resilient to changes in climatic conditions.
- **Long-term ecotourism impact:** South Australia has enormous potential for ecotourism ventures based around its unique and rich marine life. Without the protection of marine parks, there is no guarantee to prospective operators that these have long-term viability. The experience in the Great Barrier Reef is testament to the outcomes that can be achieved from well-planned and sustained marine parks.
- **Fishing viability:** while fishing management plans serve to manage the limits of a small number of commercial species, CCSA believes that the long-term viability of a fishery depends on the entire web of species that support those commercial species. Without marine parks and sanctuary areas, there are no guarantees that this complex web can be sustained.

CCSA has three main suggestions to make in respect of the marine parks initiative:

- **Establish the sanctuary zones and management plans without delay.** While the lengthy gestation period for South Australian marine parks has been useful in ensuring the quality of the science, it has also created a climate of uncertainty for many members of the community. CCSA strongly believes that the South Australian community would be best served by formally establishing the sanctuary zones and management plans as soon as possible.
- **Ensure Sanctuary Zones comply with the design principles.** Especially the principles of comprehensiveness, adequacy and representativeness.
- **Resource the monitoring and protection tasks adequately.** Whilst there is confidence that the community will respect and support the management plans within parks, adequate resourcing will be essential particularly in the early years. If this is not done, the parks may essentially be "paper parks" – without the substance to be effective and to ensure that visitors to parks understand their obligations. It is vital that the uncertainty of the last few years is replaced by a substantial commitment to educating the community and celebrating the extraordinary opportunity that these parks present to South Australia.

CCSA has responded in detail to the Select Committee's terms of reference in the attachment to this letter. As the peak body for South Australian conservation groups and as part of a South Australian Marine Conservation Alliance (SAMCA), I request an opportunity for a representative from CCSA to meet with the Committee and discuss these points in more detail, if that

would assist this important initiative. We also support the request of The Wilderness Society to appear, in light of their knowledge of the marine parks concept, and their long-term support for the SA Marine Parks program.

Yours sincerely,

A handwritten signature in black ink that reads "Tim Kelly". The signature is written in a cursive style with a large initial "T" and a long horizontal stroke.

Tim Kelly
Chief Executive

Cc Minister for Environment and Conservation

Chief Executive, Department of Environment and Natural Resources

Executive Director, Policy, Department of Environment and Natural Resources



Conservation Council SA

Submission to the Select Committee on Marine Parks in South Australia.

29th July 2011
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The **Conservation Council of South Australia Inc (CCSA)** is the peak conservation body for South Australia, representing over 50 of the State's environment and conservation organisations.

CCSA is an independent non-profit, non party-political, community based organisation which provides resources, advice and representation for the SA environment movement, and which leads many of the key conservation campaigns in SA.

CCSA is known for its success in developing long term community development, education, and on-ground environmental restoration programs.

CCSA regularly liaises with Local, State and Federal Governments, Government agencies, media, educational institutions, NGOs, unions, industry, business and other groups on matters relating to the environment and social justice.

As a community organization, much of what CCSA achieves is through a large network of skilled volunteers from all walks of life – for its office, on-ground, governance and campaign activities.

CCSA is committed to a healthy environment for South Australia.

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Select Committee on Marine Parks in South Australia Responses to the Terms of Reference of the Inquiry

Introduction

The waters of southern Australia contain an extraordinary diversity of marine life. More than 6,000 identified marine species inhabit our waters¹. Up to 90% of these life forms are found nowhere else on earth, yet less than 1% is protected in sanctuary zones designed to conserve biological diversity.

The threats to the South Australian marine environment are significant and are predicted to increase. Already our marine ecosystems have been heavily impacted resulting in reduced biodiversity and abundance of our unique native species. Conservation groups have been the contact point for many concerned members of the public, including recreational fishers, concerned about changes in their local marine and coastal environment. The pressure on marine environments come from a number of sources, such as fishing, climate change, land and marine pollution, and bio-security issues such as introduced pests and diseases. As the human population increases, this pressure will intensify. It is of paramount importance to set aside some parts of the ocean to provide a refuge for species to allow them some respite from otherwise ubiquitous pressures.

In order to address potential impacts due to these threats, Australia is committed to developing a comprehensive system of marine parks under the National Representative System of Marine Protected Areas (NRSMPA). Australia's Commonwealth, State and Northern Territory governments are working together to implement the NRSMPA. Australia also aims to realise its international commitments as a signatory to the Convention on Biological Diversity through the significant expansion of its existing Marine Protected Area (MPA) network throughout Australia's Exclusive Economic Zone (EEZ) by 2012.

The South Australian Government has specific obligations to protect biodiversity outlined in the South Australian Strategic Plan Objective T3.1 'Lose no species' with a specific marine biodiversity target, 'T 3.4 Create 19 marine parks aimed at maximising ecological outcomes'. The Marine Parks Act (2007) was established to enable this process. Marine parks are a highly secure form of environmental protection, and can only be removed by passage through both houses of parliament, as is appropriate for a foundation conservation measure. CCSA is committed to achieving a comprehensive, adequate and representative system of Marine Parks in the full belief that a healthy, resilient marine environment will ultimately benefit all South Australians now and into the future.

¹ DENR, 2010. Fact sheet, The natural values of South Australia's marine environment

Specific Responses to Terms of Reference

a) What scientific evidence is available to guide the design and management of marine parks

A comprehensive, adequate and representative system of Marine Parks including, at their core, well-designed sanctuary zones have been shown to offer the best method to protect our marine environment, from the multiple and cumulative threats it faces. The discussion in response to Criterion a) is grouped under five headings:

1. General Discussion regarding the scientific evidence
2. Scientific evidence of damage to the marine environment, (identification of the threats to the marine environment and the pressing need for better marine conservation outcomes)
3. Scientific evidence regarding the best method to achieve better marine conservation outcomes, (which has overwhelmingly been shown to be a network of well designed Marine Parks with sanctuary zones)
4. Scientific evidence to specifically support the marine park program in SA
5. Scientific evidence regarding the management of Marine Parks

1. General Discussion regarding the scientific evidence

What are the scientists saying?

In formulating our position CCSA is mindful of the scientific weight behind a position paper supporting the call for marine parks from the Australian Marine Sciences Association (AMSA). AMSA is Australia's largest professional association of marine scientists with over 900 members across Australia. The AMSA position paper on Marine Protected Areas states "AMSA believes that MPAs are vital for the conservation of Australia's marine environment and threatened species". They also state that no-take (sanctuary) zone protection of 10% of the marine environment would not be adequate to halt biodiversity loss, but would only slow it. They state that "the current no-take level in the GBRMP (Great Barrier Reef Marine Park) of 33% is more likely to achieve substantial and sustained biodiversity benefits"².

CCSA also recognises additional support for large, well-designed marine sanctuary zones described in a University of Queensland paper³, representing the consensus of over 40 scientists who have an active involvement in the planning and management of Marine Protected Areas in Australia. This document recommends "Individual conservation features should all be represented in high protection zones at a minimum of 30% as a proportion of their distribution within each bioregion"

² Australian Marine Sciences Association (AMSA), 2008, Position Paper on marine protected areas.

³ The Ecology Centre, The University of Queensland (2009) Scientific Principles for Design of Marine Protected Areas in Australia: A Guidance Statement. 29pp. Available at <<http://www.uq.edu.au/ecology/index.html?page=102441&pid=108450>>

(original emphasis). The science behind the size of marine sanctuary zones is discussed in our response to criterion (f).

Marine biodiversity is declining Australia-wide, with a national marine biodiversity decline working group noting "Australia's marine biodiversity and ecosystems are in a state of continuing decline. The effects of a number of threatening processes are resulting in declines in habitats, changes in ecosystems and loss of species"⁴

Additionally, we cite the position of South Australia's Marine Parks Scientific Working Group, which advises the South Australian Government on the design principles of marine parks and sanctuary zones, and consists of 11 independent, highly regarded marine scientists. The working group reviewed hundreds of scientific papers on marine parks and concluded "multiple use marine parks are a necessary component of effective management of coastal environments"⁵.

CCSA would also like to ask the Select Committee to consider the following question. Where is the scientific evidence to support the case that marine parks are not warranted?

The science behind protecting incompletely understood ecosystems

A large amount of effort within the field of conservation science has been directed toward answering the question of 'How do we protect ecosystems and species that we do not understand completely?' An inescapable fact is that poorly understood systems, can still be seriously impacted by human activities. There is not, nor is ever likely to be, enough scientific funding to explore and adequately understand all the complexities of the ecosystems on the receiving end of human activity. Setting aside some areas, as national parks or similar, in order to minimise human impacts has been an accepted practice for nearly 150 years. Historically these areas have been based on features such as scenic appeal to humans, rather than a scientific approach designed to conserve habitats and biodiversity. Marine protected areas have been particularly underrepresented by this approach.

Over time, scientific understanding of ecosystems grew, and protected areas were designed to protect particular species and ecosystem functions not just aesthetic appeal. Equally, scientific understanding of methods to protect less well-understood systems grew. Simply put, the basic approach has been for representative samples of 'habitat type' (a feature more easily recorded and used as a proxy for 'biodiversity') to be set aside in some kind of protected zone. The hope is that by removing some of the anthropogenic pressures on these systems, these 'more natural' ecosystems are more resilient and better able to adapt to the multitude of other threats (human and otherwise) they face. Hopefully this means these habitats and the species that depend upon them, are more likely to persist into the future.

⁴ A National Approach to Addressing Marine Biodiversity Decline – Report to the Natural Resource Management Ministerial Council, 2008

⁵ Port Lincoln Times, 5 April 2011, Letter to the Editor from Prof Anthony Cheshire, Chair of the Scientific Working Group

Ecosystem 'resilience' in the marine setting, can be eroded by a variety of human activities (fishing, water quality decline, sedimentation), leading to 'regime shifts' to 'alternative states'. These changes are away from a 'natural' state, toward a domination of the species that are better adapted to survive in the altered environment, so called 'weedy' or 'pest' species. These shifts have been discussed in a number of scientific papers and are thoroughly discussed in a highly regarded internationally used university text written by two University of Adelaide marine scientists.⁶

Marine ecosystems warrant the use of the Precautionary Principle

The precautionary principle is another supporting argument for action on protection for marine ecosystems. As defined in the Marine Parks Act (2007) "if there are threats of serious or irreversible harm to the marine environment, lack of full scientific certainty should not be used as a reason for postponing measures to prevent harm". There is no likelihood that filling knowledge gaps in specific areas would justify less protection than that described in the 14 design principles as developed by the Scientific Working Group.

Much of the opposition to SA Marine Parks has been based on a lack of understanding of the enormous body of science that helps us effectively protect that which is incompletely known. One of the opposing arguments is that knowledge gaps related to the SA environment is a critical failing of the current Marine Park process. To CCSA, and the vast majority of marine scientists in Australia, the South Australian Marine Parks program as currently proposed, conforms to best practice Marine Protected Area science.

Fisheries Management is not biodiversity conservation

Critics of marine sanctuary proposals often claim fisheries management can address biodiversity conservation issues, however this is not correct. Fisheries are not managed to conserve biodiversity, they are managed with a narrower objective.

Fisheries management aims maintain the maximum sustainable yield of the target species. In this context the word 'sustainable' really means continuous and in no way considers the broader impacts on ecosystems. Fisheries have an intrinsic interest in maintaining stocks of target species. Most of the effort in fisheries management goes into understanding how to catch fish effectively and efficiently and in detecting changes in catch rates, which might relate to changes in the abundance of the target species. Changes in catch rates also affect the profitability of fishing activities. Whilst fisheries management seeks to mitigate negative fisheries impacts, such as by-catch there is no such intrinsic need within fisheries management to conserve non-target species or to mitigate ecosystem wide impacts, unless these impacts cause reductions in stocks of target species.

Put simply, there are managed fish species with less than half of the pre fishing biomass. In complex predator prey ecosystems, when a large proportion of the pre-fished biomass is removed, (in some cases well over half the biomass of predator species or prey species is removed in managed fisheries) there are significant

⁶ Connell S.D., and Gillanders B.M. (Eds) (2007) Marine Ecology, Oxford University Press

changes and impacts on ecosystems. This can be described as 'Ecosystem overfishing'. Predators that rely on prey which are also targeted by fisheries decline or switch to targeting other species and some populations of prey can increase to problem levels when essential predators are removed.

One example of ecosystem overfishing has been identified in a Tasmanian study that looked at decline in rock lobster abundance (due to fishing), which resulted in an increase of sea urchins (rock lobsters eat sea urchins) that grazed kelp forests down to bare rock, resulting in a completely changed habitat, and associated biodiversity loss⁷. This example demonstrates the type of biodiversity conservation problem that can occur despite good fishery management.

Fisheries can also have significant negative impacts on vulnerable⁸ non-target species, e.g. dolphins, sea lions and sea birds. Not only is bycatch likely to be underreported (on a number of occasions fisheries in SA failed to accurately report mortalities of threatened, endangered or protected species or 'TEPS'⁹) but the significance of the impact on these species is poorly understood because we have insufficient knowledge of populations in SA waters.

Another issue is that fisheries management addresses a relatively small number of marine species, around 20-30 target species, mostly finfish, and a few hundred bycatch species, compared to the 6000+ known marine species in SA waters. Of the targeted species only around 13 species are given full scientific stock assessments. A working group that investigated marine species of conservation concern¹⁰ identified nearly 200 species of concern, most not commercially fished species¹¹ and therefore not 'managed' in any respect.

Accurate records for SA fisheries have only been kept since the 1980's, and would undoubtedly have been affected by baseline shift¹². Interactions with TEPS have

⁷ Buxton C., Barrett N., Haddon M., Gardner C., Edgar G., (2006) Evaluating the effectiveness of Marine Protected Areas as a Fisheries management Tool. Report to Fisheries Research and Development Corporation Project No. 1999/162

⁸ Naturally vulnerable due to low reproductive ability, site attachment, and late sexual maturity.

⁹ D.J. Hamer, A. Ivey and T.M. Ward (2009) Operational interactions of the South Australian Sardine Fishery with the Common Dolphin: November 2004 to March 2009. SARDI Aquatic Sciences Publication No. F2007/001098-2. SARDI Research Report Series No. 354.

¹⁰ The Marine Species of Conservation Concern Working Group, membership consisted of Threatened Species Network SA (Chair); Marine and Coastal Community Network SA; DEH Coast and Marine Branch; PIRSA; SARDI; SA Museum and University of SA.

¹¹ Baker, J.L. (2009) Marine Species of Conservation Concern in South Australia: Volume 1 - Bony and Cartilaginous Fishes. Report for the South Australian Working Group for Marine Species of Conservation Concern. J. Baker (consultant); Science and Conservation Division, and Coast and Marine Conservation branches of S.A. Department for Environment and Heritage (DEH); Marine and Coastal Community Network of S.A. (MCCN), and Threatened Species Network (TSN). Web version published by Reef Watch, South Australia.

¹² Baseline shift can be described as the tendency to measure changes to natural systems in terms of changes seen over a person's lifetime. Thus change is prior to that lifetime may be overlooked. An easy to understand description of this concept can be found at <http://www.psp.wa.gov/shiftingbaselines.php>

only been recorded in a dedicated fishing logbook since 2007, and there was a three year delay before the data was published in May, 2011¹³.

Fisheries management does not (and cannot) take into account the complete picture of how fishing activities affect the ecosystem. No fishery in South Australia has an adequate system in place for assessing and managing broader ecosystem effects of its fishing activities and catch. While one broad study related to an area (the Great Australian Bight) has occurred, the available data was in some instances extremely limited. In terms of an ecosystem-wide fishery impact study only one has been completed in SA¹⁴. The costs of this research are another limiting factor. Most independent studies looking at broader ecosystem impact of fisheries have only been possible due to additional funding.

SA fisheries are run under a full cost- recovery system, and the level of research needed to fully investigate all ecosystem impacts is likely to significantly reduce profit. A vast number of (expensive) studies would be needed to identify all the impacts on all the multitude of species and then devise and test mitigation strategies. Then there would be the costs of implementation, management and compliance activities. There is no consensus between fishing industry, researchers and managers as to how these costs might be allocated. In contrast sanctuary zones are a simple, comparatively cheap and relatively easily managed solution to protect biodiversity. Nevertheless it is important to recognise that good fisheries management is an important tool that complements biodiversity conservation measures and is part of a sustainable future.

2. Scientific evidence of damage to the marine environment, (identification of the threats to the marine environment and the pressing need for better marine conservation outcomes.)

The marine environment faces many threats, including, fishing impacts, climate change, water quality deterioration (from litter, sedimentation, nutrients, pollution), coastal development, exploration for, and extraction of oil and gas reserves, and biosecurity issues. The threats and impacts apply to ecosystems that straddle across State and Commonwealth waters, and beyond where specific activities may take place.

¹³ Knight, M.A. and Vainickis, A.a. (2011) Interactions with Threatened, Endangered or Protected Species in South Australian Managed Fisheries – 2007/08, 2008/09, and 2009/10. Report to PIRSA Fisheries and Aquaculture. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication no. F2009/000544-1. SARDI Research Report Series no. 534. 44 pp.

¹⁴ Goldsworthy, S.D., Page, B., Rogers, P. and Ward, T (2011). Establishing ecosystem-based management for the South Australian Sardine Fishery: developing ecological performance indicators and reference points to assess the need for ecological allocations. Final Report to the Fisheries Research and Development Corporation (PDF 3.0 MB). South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2010/000863-1. SARDI Research Report Series No. 529. 173pp.

Fishing Impacts

Many marine sanctuary zone opponents think the best way of protecting the marine environment is by addressing threats, a 'threats-based approach', which is seen to eliminate the need for adequately sized sanctuary zones. This conveniently overlooks the fact that fishing itself is the biggest threat to marine biodiversity in Australia. It has been well established that the extraction of living resources (i.e. through fishing) is one of the major threats to marine biodiversity¹⁵. This occurs through disruption to ecosystem function e.g. competitive interactions and predator-prey relationships, as well as bycatch, and habitat destruction e.g. from benthic (sea floor) trawling. Furthermore this is flawed thinking as it assumes we know (or can learn) all threats. Additionally it assumes all these threats can be effectively mitigated.

Bycatch is a significant problem in all fisheries, however, it is particularly prominent in net fisheries. Bycatch from net fisheries is highly variable but can be as high as 15 tonnes of bycatch for every 1 tonne of the target species¹⁶. Prawn trawl fisheries are consistently rated as the worst offenders and while bycatch is generally thrown over the side, this does not mean the animals concerned survive:

- Many fish rupture their swim bladder (an essential internal organ used for buoyancy control) as a result of the rapid ascent in a net, or will at least have pressure equilibration problems that prevent their descent on release, which leaves fish floating and highly vulnerable to predators¹⁷.
- There is also external physical damage suffered to scales, gills, fins and eyes whilst thrashing against the net and other captives.
- Most species experience significant stress during capture and release¹⁸, and the physiological stress experienced may reduce the survival and/or reproductive capacity of the animals.
- At least some of the species captured will be territorial with little if any chance of returning to a suitable home range.

The impact of prawn trawling on benthic systems has been widely researched in Gulf St Vincent, Spencer Gulf and elsewhere in Australia and worldwide. In a study of the Gulf St Vincent prawn fishery, "epifauna [plants and animals that live on the seabed] at trawled sites decreased in abundance by 28% within 2 weeks of trawling and by another 8% in the following 2–3 months (compared with control sites)"¹⁹. Yet despite the environmental impacts of trawl fisheries being well documented this has little influence on their management.

¹⁵ Australian Marine Sciences Association (AMSA), 2008, Position Paper on marine protected areas.

¹⁶ Hall, M. Alverson, D.L. Metzals, K.I. (2000). By-Catch: Problems and Solutions. *Marine Pollution Bulletin*. **41**. pp. 204–219.

¹⁷ Clucas, I. (1997). Discards and bycatch in Shrimp trawl fisheries. FAO Fisheries Circular No. 928 FIU/C928

¹⁸ Svane, I., Rodda, K. and Thomas, P. (2007) *Prawn fishery by-catch and discards: marine ecosystem analysis – population effects*. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. RD 03-0132.

¹⁹ Tanner, J. (2003). The influence of prawn trawling on sessile benthic assemblages in Gulf St. Vincent, South Australia. *Canadian Journal of Fisheries and Aquatic Sciences* **60**: 517-526.

Furthermore the cumulative effects of all fisheries operating in SA waters are completely unknown. No research has been conducted into the combined environmental effects of multiple fisheries operating in any given area. These cumulative effects may be synergistic; meaning the total ecological impact is more than the sum of the individual fishery impacts.

Critics of marine sanctuaries that claim fisheries management can effectively protect biodiversity are placing enormous reliance on perfect fisheries management. While South Australian fisheries management has a generally good reputation, our fisheries still have serious issues. Even for some target species, we have significant knowledge gaps in basic biology, life history and habitat needs. Also, six out of sixteen SA fisheries are classified as either overfished, or depleted²⁰. Funding is only available for a few fish stocks of high economic value to undergo the full stock assessment process each year. Below is a short description of some of the difficulties faced by SA fisheries.

Marine Scalefish Fishery

Garfish stock is depleted, and annual catch has declined by approximately 40% since 1995²¹. Garfish spawning grounds unknown, although suspected spawning grounds in Upper Gulf St Vincent were not included for sanctuary zone protection in LAG advice to the Minister.

King George Whiting, 2007/8 catch declined to approximately 50% of 1992 catches. Fishing occurs on known spawning grounds (at entrance to Investigator Strait). Shark gillnetting is contributing to Australian sea lion extinction risk, gillnetting is also known to have dolphin and mako shark (protected species) bycatch. Two species of shark (bronze whaler and dusky whaler) targeted in this fishery are commonly recorded in fishery documents as only one species²², (bronze whaler), therefore the actual impact on each species is unknown.

Spencer Gulf Prawn Trawl Fishery

Benthic (sea floor) trawls are known to be a damaging practice, and has bycatch at a minimum rate of 2 tonnes bycatch for every 1 tonne prawns. Of particular concern is the bycatch of seven species of the Syngnathid family (seahorses, seadragons and pipefish) protected under the EPBC Act. The capture rates are high enough to cause concern (thousands per year), and a 2009 bycatch report acknowledges limitations regarding the impact of prawn trawling on syngnathids, "...the ecological consequences for these species remain unknown"²³.

²⁰ Doroudi M (2011) Powerpoint presentation to Parliament in 2011.

²¹ Fowler AJ, McGarvey R, Steer MA, Feenstra JE (2008) South Australian Marine Scalefish Fishery-Stock Status Report. Report to PIRSA. SARDI (Aquatic Sciences), Adelaide, F2007/000565-3, SARDI Research Report Series No. 321

²² Jones, K., (2008) Review of the Fishery Status for Whaler Sharks (*Carcharhinus* spp.) in South Australian and adjacent waters. FRDC Project No. 2004/067. SARDI Aquatic Sciences Publication No. F2007/000721-1. SARDI Research Series No. 154

²³ Currie D.R., Dixon C.D., Roberts S.D., Hooper G.E., Sorokin S.J., Ward T.M. (2009) Fishery independent by-catch survey to inform risk assessment of the Spencer Gulf Prawn Trawl Fishery. Report to PIRSA Fisheries, SARDI Aquatic Sciences Pub. No. F2009/000369-1, pg 43

Rock Lobster

Rock lobster stocks have suffered declines in recent years²⁴, the Southern Zone rock lobster fishery is classified as 'overfished', and the Northern Zone classified as 'depleted'. The quota declined from 1001 tonnes in 1999/2000 to 310 tonnes in 2009/10²⁵. Quotas higher than those recommended by fishery scientists have been allowed.

Abalone

Recent statements that this fishery is in good condition ignore the evidence of previous serial reef depletion. A number of previously very productive reefs are now either not fished or only occasionally fished.²⁶

Mud cockle fishery

Classified as overfished, subject to recent closure.

Sardine Fishery

This fishery had significant problems with bycatch of common dolphins, probably since the fishery began in 1991, and certainly significantly increased in 2000 but despite persistent rumours of bycatch problems was only subjected to an independent observer study in 2004-5. It was found to have an estimated fleet-wide bycatch of 377 dolphins that year²⁷. In addition an estimated 1728 animals were encircled by the net, which is likely to have resulted in high stress levels, with the potential for deaths post-release due to exertional myopathy. In addition, every sexually mature female dolphin killed due to interaction with the fishery is likely to have left a dependent calf, which would also have died but has not been counted as bycatch (called calf deficit). The fishery was closed until a code of practice was put in place to minimise dolphin interactions. The vast majority of the sardines caught in this fishery are used as feed for tuna in aquaculture pens. The process of catching one type of fish (sardine) to feed to another type of (endangered) fish (southern bluefin tuna in aquaculture pens) which is then sent to Japan, might make economic sense, however it cannot be classified as ecologically sound. Furthermore a number of protected species including marine mammals (Australian Sea Lion, bottlenose dolphins, common dolphins) and shark have been killed by aquaculture pen nets.

²⁴ Linnane A, Gardner C, Hobday D, Punt A, McGarvey R, Feenstra J, Matthews J and Green B (2010a) Evidence of large scale spatial declines in recruitment patterns of southern rock lobster *Jasus edwardsii* across south-eastern Australia. *Fisheries Research* **105**, 163–171.

Linnane A, Sloan S, McGarvey R and Ward T (2010b) Impacts of unconstrained effort: lessons from a rock lobster (*Jasus edwardsii*) fishery decline in the northern zone management region of South Australia. *Marine Policy* **34**, 844–850.

²⁵ Knight, M.A. and Tsolos, A. (2011). *South Australian Wild Fisheries Information and Statistics Report 2009/10*. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2008/000804-3. SARDI Research Series No. 521. 60 pp.

²⁶ Shepherd, S.A. & Rodda, K.R. (2001). Sustainability demands vigilance: evidence for serial decline of the South Australian greenlip abalone fishery and a review of management. *J. Shellfish Res.* 20: 829-841.
Shepherd, S.A., Rodda K.R. & K.M. Vargas. (2001). A chronicle of collapse in two abalone stocks with proposals for precautionary management. *J. Shellfish Res.* 20: 843-856.

²⁷ Hamer, D.J., Ward, T.M., McGarvey, R., (2008). Measurement, management and mitigation of operational interactions between the South Australian Sardine Fishery and short-beaked common dolphins (*Delphinus delphis*) *Biological Conservation*, 141. 2865-2878

This fishery is the only fishery in SA that has received scientific attention in relation to its potential broader ecosystem effects. Concerns remain regarding the potential mal-distribution of effort within this fishery, particularly in relation to Southern Spencer Gulf.

Lakes and Coorong Fishery

Half of the eight species caught in this fishery have recently been identified as being longevity overfished.²⁸ The pipi fishery was recently subjected to significant closures to allow recovery.

Ocean jacket

The catches of previously abundant ocean jacket species seem to have declined dramatically. Unfortunately very little is known of these stocks as no monitoring is undertaken.

Recreational fishing

While most accept commercial fishing impacts the marine environment, some are not aware of the impacts of recreational fishing. Figures from a 2007-8 survey²⁹ of recreational fishers showed that over 230,000 SA residents fished at least once in the preceding 12 months, resulting in over one million days fished, 10 million marine organisms caught³⁰ and 98 different species recorded as catch. To put that in perspective the report author provides some comparisons with the total (recreational + commercial) fishery catch. "The recreational harvest either equalled or exceeded commercial production for species such as King George Whiting (50% of the total harvest), Mulloway (62%) ... Others comprised substantial minorities of total harvest such as Snapper and Southern Garfish (each about 20%), Blue Swimmer Crab (30%), Southern Calamari (41%)".

In summary, the cumulative impact on ecosystems from fishing activity in South Australia is significant. No take marine sanctuary zones and management plans provide the necessary comprehensive and adequate protection of representative ecosystems in South Australia.

Impacts of Climate Change

Climate change effects may be mitigated or exacerbated by local conditions, however on balance there are significant risks to our marine environment, particularly where ecosystems may already be under stress from human activity.

Predicted changes such as sea level rise, ocean current changes, ocean acidification and higher sea surface temperature may result in changes to

²⁸ Ferguson, G.J., Ward, T.M., Ye, Q., Geddes, M.C. and Gillanders, B.M. (2010) Impacts of drought, flow regime and fishing on the fish assemblages in southern Australia's largest temperate estuary. Fishery stock assessment report for PIRSA. SARDI Publication No. F2010/000709-1.

²⁹ Jones, K. (2009) South Australian Recreational Fishing Survey. PIRSA Fisheries, Adelaide, 84 pp. South Australian Fisheries Management Series Paper No 54.

³⁰ Approximately 64% were retained, the rest were released (undersize, not target species etc) however post-release survival rates are not well understood but suspected to be low for many species.

reproductive success in some marine species, habitat loss, changes in species distribution³¹.

Sea level rise may also result in changes to mangrove formations and other areas that are important as breeding and nursery zones.

Population or species extinctions (especially in temperate waters with high endemism), can result in other species increasing to problem levels as well as a greater risk of new introduced pest species becoming established.

Oil and Gas Exploration and Extraction

A number of current exploration leases adjacent SA waters, may result in impacts from exploration, and perhaps in time extraction. Exploration seismic testing has been identified as a risk to many marine species. The underwater noise of seismic explosions is loud enough to cause temporary or permanent hearing damage in species of whale and dolphin. They are also likely to disturb, feeding, migration, communication and mating behaviours³², as well as potentially having negative effects on prey species.

An enormous oil spill from the Montara Oil Field off Western Australia in 2009 caused massive ecological damage, releasing somewhere between 1.2 and 9 million gallons of oil, covering approximately 6,000 km².

More recently the April 2010 Deepwater Horizon Oil Spill, also known as the Mocondo Oil Spill, showed the difficulty in stopping deep water oil leaks, and the resultant inability to protect the environment from damage.

Marine Debris

A significant proportion of marine debris is related to fishing, both commercial and recreational. Non-biodegradable nylon fishing line, stainless steel hooks, plastic bait bags, bait box straps, and lost nets all pose significant risks to other sea life, such as sea birds, seals and sea lions, dolphins and whales.

Other Impacts

Coastal development and water quality deterioration has already had a significant impact on SA marine environment. These problems are likely to increase as coastal development and water quality issues continue, particularly as the state's population grows. Bio-security remains a constant threat. There is a significant risk of

³¹ Last, P.R., White, W.T., Gledhill, D.C., Hobday, A.J., Brown, R., Edgar, G.J. and Pecl, G (2011) Long-term shifts in abundance and distribution of a temperate fish fauna: a response to climate change and fishing practices. *Global Ecol. Biogeogr.* **20**: 58-72

³² M.P Simmonds. & S., Dolman A note on the vulnerability of cetaceans to acoustic disturbance. *Paper to International Whaling Commission* 51/E15. 1999
Mark Simmonds, Sarah Dolman and Lindy Weilgart, "Oceans of Noise: A WDCS Science Report" Whale and Dolphin Conservation Society 2003

an unhealthy synergy with bio-security risks being magnified by coastal development³³ and increased recreational boating due to population growth.

It is important that South Australia ensure that its marine ecosystems are strengthened to be resilient against all threats and impacts. For a total assessment of human impact on the marine ecosystem, not only must the fishing related impacts be assessed but also the additional threats such as pollution, coastal development, exploration for, and extraction of oil and gas reserves, and bio-security issues. The Marine Parks Act alters 12 other SA Acts, requiring other government agencies to address some of these threats. In this way Marine Parks do provide a legislative mechanism by which actions to address these other threats can be triggered.

3. Scientific evidence regarding the best method to achieve better marine conservation outcomes, (marine park design, general concepts)

An enormous number of scientific papers have provided evidence about benefits of highly protected 'no-take' or sanctuary zones as part of a marine park system. Well designed and well connected networks of MPAs can achieve the following outcomes:

- maintaining or restoring ecosystems by protecting physical habitats from damage;
- protecting ecological processes by maintaining abundances of keystone species, maintaining resilience by removing stresses, preventing unforeseen thresholds being reached and maintaining food webs;
- protecting biodiversity by preventing loss of vulnerable species, protecting spawner biomass, restoring population sizes and diverse age structures, and restoring community composition;
- protecting genetic diversity that is important to evolution and the maintenance of resilient ecosystems that can absorb the shock of, and/or adapt to, change;
- maintaining high quality feeding areas;
- catering for nature-based recreation and tourism;
- providing undisturbed control or reference sites that serve as baselines for scientific research and for evaluating the health of other areas³⁴; and
- promoting a holistic approach to ecosystem management³⁵.

³³ Ports are often the introductory mechanism, and marinas are artificial habitat conducive to growth of introduced species (e.g. European fan worm) and therefore translocation via fouled boat hulls. See more info here: <http://www.marinepests.gov.au/home>

³⁴ Babcock, R.C., Phillips, J.C., Lourey, M. Clapin, G. (2007) Increased density, biomass and egg production in an unfished population of Western Rock Lobster (*Panulirus cygnus*) at Rottne Island, Western Australia. *Marine and Freshwater Research*.

³⁵ Department for Environment and Heritage (2009). *A technical report on the outer boundaries of South Australia's marine parks network*. Department for Environment and Heritage, South Australia.

4. Scientific evidence to specifically support the marine park program in SA.

In addition to the scientific evidence discussed above, the Marine parks program was supported by DENR technical staff, with extensive specific South Australian habitat mapping, and biodiversity hot spot mapping, and biodiversity surveys designed to inform the selection of sanctuary zones. Data from the community collected via the SA Marine Parks Information Tool (SAMPIT) was also used in Marine Park development.

More scientific evidence to support the SA marine park program is detailed in the submission from the Reef Watch scientific steering committee.

5. Scientific evidence regarding the management of Marine Parks

Adequate funding for ongoing marine park management is vital. The collection of baseline data and continued monitoring of the ecological performance of the marine parks is a fundamental component.

As outlined in the AMSA Position Paper 'All MPA's should be managed (within a dedicated budget) monitored and assessed. Management plans must identify key values to be protected, and establish indicators by which these values can be monitored. Any national or regional assessment of a MPA or a MPA network must be based at least in part on the extent to which identified values are maintained or enhanced over time. Assessments of the effects, and effectiveness, of MPA's at zone, reserve or system level should be placed within a transparent adaptive management framework, allowing progressive improvement of MPA design and implementation'.

In particular, funding for compliance is essential. As stated in the AMSA position paper, 'Compliance cannot be taken for granted. Even in Australia, where fisheries are often perceived to be well-managed, there is ample evidence not only of non-compliance, but of cultures of non-compliance. For example Poiner et.al. (1998:s2) in a study of prawn trawling in the Great Barrier Reef World Heritage Area reported: "there has been a high level of illegal trawling in the Green Zone and evidence that 40 to 50 boats regularly trawl the area. Misreporting of catch has taken place with catches from inside the Green Zone being credited to adjacent open areas." Cultures of non-compliance will arise where absence of enforcement is predictable.'

Additionally marine park management must be assisted by effective management of other marine issues such as better fisheries management, climate change adaptation strategies, pollution mitigation and biosecurity measures.

b) Detrimental effects to recreational fishers and the commercial fishing industry through the imposition of marine parks

While no-take sanctuary zones are not a fisheries management measure, a large number of scientific papers have outlined the benefits of no-take zones to fisheries management. A recent literature review of hundreds of scientific papers on marine protected areas (MPA's) concluded that "while benefits are not always evenly distributed across all MPA's, evidence is clearly showing that abundance, biomass, economic value, habitat and migration routes are all enhanced by the declaration of MPA's"³⁶. Furthermore by providing unfished reference locations researchers can more clearly differentiate between changes due to fisheries management practices and that caused by other confounding variables such as climate change. This is an important research tool, currently unavailable at the scale proposed via the SA Marine Parks program.

Information from the public was recorded by DENR's SAMPIT tool, and was used to avoid where possible popular recreational fishing areas and to some extent commercial fishing area. (Data regarding commercial fishing was often not supplied at the fine scale needed to inform the relatively small scale sanctuary zone areas). Some popular locations are also areas of high conservation value, resulting in a clash of values and therefore a mistrust of the use of the data supplied.

Limitations to recreational fishing access has been contentious, however much concern has been related to the perceived potential downturn in recreational fishing activity. Despite this high level of concern, many studies indicate better fishing will be likely near sanctuary zones, commonly referred to as the 'spill-over' effect³⁷. One study showed that "during an 8 to 17 year protection period, harvested spillover offset the loss of yield resulting from the reduction of fishing grounds set aside in the (marine sanctuary), producing a mean annual net benefit of 10% of the catch in weight"³⁸. The benefits Marine Parks can provide competitive anglers due to increased species diversity, abundance and size in areas adjacent no-take zones is evidenced by the recent WA Angling Competition situated next to the Ningaloo Marine Park. Areas adjacent to Marine Parks become destinations especially with anglers keen to catch personal best size fish, or a sought after species. Furthermore when the Great Barrier Reef Marine Park increased in size from 5% to 30% no discernable change in boat registrations was recorded. Recreational fishers also appreciate other facilities, so upgrades to boat ramp facilities, and fish cleaning stations would be used to offset any perceived drop in visitor numbers.

³⁶ Nursey-Bray, M. 2011, More than fishy business – a literature review of marine parks, The University of Adelaide http://adelaide.academia.edu/MelissaNurseyBray/Papers/393942/More_than_Fishy_Business_A_Literature_Review_of_marine_parks

³⁷ Abesamis RA, Russ GR, Alcala AC (2006) Gradients of abundance of fish across no-take marine reserve boundaries: evidence from Philippine coral reefs. *Aquatic Conservation: Marine and Freshwater Ecosystems* 16:349-371

³⁸ Goñi R, Hilborn R, Díaz D, Mallol S, Adlerstein S (2010) Net contribution of spillover from a marine reserve to fishery catches. *Marine Ecology Progress Series* 400:233-243

Commercial fishers were extensively consulted in the development of the marine park outer boundaries, resulting in minimal overlap between park boundaries and commercial fishing areas. Furthermore the Marine Parks Act (2007) specifies compensation for commercial fishers.

Furthermore, the simultaneous development of all South Australian marine parks helps to minimise uncertainty in terms of potential impact on local businesses, and impacts on commercial fishers that may wish to relocate.

c) Detrimental effects to property values through the imposition of marine parks

There is no reason why long-term property values would be detrimentally affected. Short term uncertainty may be a temporary issue, however long term improved fishing and tourism will be likely to increase demand in locations near sanctuary zones. The likely increased demand from people interested in being adjacent to world class marine parks should also be factored in. A recent housing development at Jurien Bay, WA adjacent to a marine park used this fact as a marketing tool.

Not a lot of research has been conducted into the tourism/economic benefits of Marine Parks. Most evidence is anecdotal but significantly is mostly supportive of the theory Marine Parks are beneficial to local economies. Marine Parks implemented in New Zealand and Western Australia are said by locals to have attracted tourism and been a net benefit to their community. Commonly these Marine Parks were not wanted, however opinions changed significantly with time as the benefits of the Marine Parks became obvious to local residents. CCSA has yet to find an example where the implementation of a Marine Park has been shown to be detrimental to property values.

d) Complaints by local communities and fishing groups regarding the consultation process associated with the implementation of marine parks

The early consultation phase including the use of Local Advisory Groups (LAG's) has been widely criticised. However, it is apparent that many misunderstandings were a result of the community not being familiar with this very early-stage consultation.

The outputs of the LAG groups while important are only representative of a subsection of our society. This subsection has a primary interest in extractive uses of the ocean (especially recreational and commercial fishing), with non-extractive users and conservation interests very under-represented in the LAG membership. Due to this under-representation of conservation interests they were always likely to return comments of criticism. Moreover, conservation 'representatives' were frequently subjected to verbal abuse, profanities, and even physical violence outside meetings³⁹.

³⁹ Verbal abuse was reported to CCSA at 4 MPLAG's. Physical abuse occurred at 2 MPLAGs.

In addition, the disclosure of financial interests of LAG members was not consistent, and frequently not recorded in the meeting minutes. The community information days DENR held were generally very well accepted and appreciated by local communities. Despite the criticism, the LAG process has resulted in a number of positive outcomes. One outcome is a community much more aware than usual prior to any release of draft sanctuary zones. Additionally most LAG's supported the basic idea of marine parks and sanctuary zones. The consultation thus far has identified potential sanctuary areas almost guaranteed of broad community support and other areas likely to present few concerns to extractive users of the marine environment.

e) *Interstate and international moves to limit the extent of sanctuary zones*

While there have been some backward steps in relation to marine sanctuaries notably NSW, the international, national and state trend has been toward more marine sanctuaries of larger sizes. The Australian government is currently rolling out new marine sanctuary zones. The South-East Commonwealth Marine Reserve Network was established in 2007, and the draft South-West Commonwealth Marine Reserve Network is out for public consultation now. This will be followed by the North-West Commonwealth Marine Reserve Network.

Between 1999 and 2004 the Great Barrier Reef Marine Park Authority undertook a systematic planning and consultative program to develop new zoning for the Marine Park. The primary aim of the program was to better protect the range of biodiversity in the Great Barrier Reef, by increasing the extent of no-take areas. In 2004 an increase of the area of the park designated as sanctuary zone from 5% to 33% was implemented.

In Western Australia, there has been a dramatic expansion of marine parks in the last 18 months including an extensive marine park in the Kimberley of which approx 20% is likely to be sanctuary zone.

Victoria implemented sanctuary zones covering 5% of state waters (24 no-take parks) in 2002.

Internationally, the trend is also to more and bigger marine sanctuaries. In 2009, the USA announced the largest oceanic MPA in the world. Three areas of the Pacific, spanning more than 50 million hectares, protect significant oceanic areas such as the Mariana Trench (the deepest point of the ocean).

Later in 2009, Indonesia established the largest Marine Park in south-east Asia, the Savu Marine National Park, covering 3.5 million hectares.

This year Costa Rica announced the significant expansion of a marine protected area by five times its previous size. What is especially significant is that the President of Costa Rica decreed a 'day of national pride' for the event. Costa Ricans showed

the world that they are extremely proud of their marine natural heritage. For some reason Australians have limited their pride to the Great Barrier Reef.

Marine Parks have been implemented in New Zealand since the mid 1970's and consists of 19 Marine Parks. A recent review of MPAs worldwide stated ' Marine protected areas are steadily getting bigger, which is good news for large marine predators with big habitats. Comparing the top 15 areas in 2005 to 2011, the average size has gone from just over 100,000 km² to 220,591km²'. These are the largest areas; most MPA's are still too small, too few and far between, with too little enforcement, to protect whale and other mobile marine animal habitats"⁴⁰.

f) *The correct balance of general marine park areas to no-take sanctuary zone areas*

Currently there is a serious imbalance in marine protected areas in South Australia, with less than 1% of our marine environment protected. CCSA does not recommend a specific percentage of sanctuary zone to general marine park. For sanctuary zones to result in good ecological outcomes the actual area they should cover can vary substantially. CCSA wants zones that will achieve the desired ecological outcomes. The sanctuary zones should conform to the design principles developed by the SA Scientific Working Group on Marine Parks. Another good guide is the set of 'rules of thumb for MPA's'⁴¹. Sanctuary zones must be comprehensive, adequate and representative. If these design principles are not upheld in the areas protected as Sanctuary zones, then the biodiversity conservation outcomes intended will not eventuate.

This is not about 'locking-up' areas, but about saving for the future. The balance between sanctuary areas, and areas open to extractive uses is designed to protect the health, integrity and biodiversity of our marine environment; the same environment we depend upon for many economic and recreational benefits.

⁴⁰ Erich Hoyt, (2011) Marine Protected Areas for whales, dolphins and porpoises.

⁴¹ McLeod, E, Salm, R, Green, A, and Almany J (2009). Designing marine protected area networks to address the impacts of climate change. *Frontiers in Ecology and the Environment* 7: 362–370.

Conclusion

To conclude, CCSA congratulates the Government on the marine parks initiative. CCSA is convinced by the weight of scientific evidence that a network of well designed marine parks with a core of highly protected, comprehensive, adequate and representative sanctuary zones is the best approach to reduce the current risks to marine biodiversity.

An approach such as this has the best chance of providing an efficient and cost-effective strategy to protect our marine biodiversity from multiple, cumulative, known and unknown threats. Its success is important to South Australia's future in many ways, including:

- The security of our marine biodiversity
- Increased environmental resilience against climate change
- Benefits and opportunities for tourism
- Benefits beyond the borders of sanctuaries
- Social and economic benefits

We urge that members of this Select Committee to support the establishment of management plans and no take sanctuary areas in South Australia's Marine Parks to the extent that they are truly meaningful - comprehensive, adequate and representative, for future South Australians.