



The Australian Coral Reef Society Inc

A society promoting the scientific study of Australian coral reefs

ACRS Correspondence
c/-Biological Sciences
The University of Queensland
St Lucia QLD 4072 Australia

austcoralreefsoc@gmail.com
www.australiancoralreefsociety.org

Submission to the Hawkesbury Shelf Marine Bioregion Assessment

27 September 2018
NSW Government Marine Estate Management Authority
Locked Bag 1
Nelson Bay NSW 2315

STOP PRESS!!

We have just been made aware (announcement made on the 17 September 2018) that sanctuaries, or no-take areas, will no longer be considered in the plan, before the consultation period has even concluded. This does not appear to follow due process and goes against the best interests of the community. Marine sanctuaries are vital to a healthy marine ecosystem because they protect important species and habitats. The Australian Coral Reef Society is disappointed to hear Minister Blair's response, which may lead to a review of no-take protection in other marine parks throughout NSW. Any deviation from an evidence-based approach that includes comprehensive community consultation is unwise. Our formal submission below is based on the original Proposal.

On behalf of the Australian Coral Reef Society (ACRS), we appreciate the opportunity to comment on the Hawkesbury Shelf Marine Bioregion Assessment released in August 2018. The ACRS is the world's oldest coral reef society, with a professional membership of over 250 coral reef scientists and managers. We play a prominent role in bringing conservation issues to the attention of governments and the general public (<http://www.australiancoralreefsociety.org/>). Many of our members reside and work in NSW, and we all share a strong interest in marine protection. Areas of NSW, including Sydney, contain unique coral reef habitats, which are being altered by climate change (Booth & Sear 2018), and need adequate protection.

NSW's marine estate is under increasing pressure as the population continues to expand, as well as the impacts of ongoing climate change. At a higher level the Marine Estate Management Strategy's initiatives represent an important and comprehensive management plan which we support and commend the NSW Government on this. Below we have chosen four key initiatives to comment on directly. We also refer to the State-wide Threat and Risk Assessment (TARA), underpinning these initiatives, which ranks threats to the marine estate using research summarised in comprehensive background documents.

Initiative 1: Improving water quality and reducing litter

As more coastal vegetation and habitats are cleared for coastal development, roads and agriculture; marine environments are increasingly exposed to high levels of nutrients, sediments and pollutants through land-based runoff, sewerage effluent and septic runoff. These localised environmental stressors increase turbidity and reduce light availability for marine wildlife as well as decrease overall water quality, having a far-reaching effect on marine biodiversity. Thus, we support the comprehensive list of initiatives proposed to improve water quality and reduce marine litter and have some additional suggestions to supplement these plans.

As we have seen with other large successful initiatives to manage catchments, for example the Smartcane BMP initiative reducing run-off to the Great Barrier Reef from sugar cane farming (Saunders et al. 2017), a community driven, self-assessment based NSW initiative such as this could also have success at reducing impacts of agriculture and industry on water quality. We also strongly support the continued research and development into new technologies in water quality management, for example new water recycling approaches, nutrient removal and the treatment of wastewater in algal systems (i.e. Lema and Martinez 2017).

We also ask the NSW Government to further support local initiatives aiming to reduce marine litter, in addition to local government run programs. These community run NGOs, such as Tangaroa Blue Foundation and Take3, effectively engage the local community in educational and hands-on activities that have immediate impact and provide creative solutions, often involving new technologies and approaches. We also suggest that additional regulatory measures and resource allocation be used to reduce pollution, especially plastic pollution, through the implementation of bans on single use plastics and continued support for the container deposit scheme. Lastly, we note that fishing debris is a major source of coastal litter (Smith et al. 2013). Along with the proposed education campaigns and the installation of new bins, especially in litter hotspots, compliance and enforcement activities need to be implemented if behavioural change programs are going to be successful.

Initiative 2 Delivering healthy coastal habitats with sustainable use and development

We believe that the 25 proposed marine parks are geographically extensive in their latitudinal spread along the Hawkesbury Shelf, although we note a gap in protection between Wollongong and the Royal National Park to the south of Sydney. In general, we applaud the spatially explicit approach to conservation planning endorsed in the discussion paper. However, while Marxan spatial planning software provides an objective, strategic approach to marine conservation, the results derived will only be as good as the layers used as input spatial data. We note that the nature and condition of many benthic habitats and associated marine flora and fauna that fall within the Marine Bioregion, particularly those that are proposed as marine parks, are largely unknown. We suggest that targeted underwater surveys and mapping campaigns focussed on the biophysical features, habitat, vegetation and populations of marine mammals, fish and associated invertebrates would greatly improve the information upon which the reserve boundaries can be planned to effectively integrate the selection criteria outlined in Appendix 4 (e.g. regarding habitat types and connectivity). In several areas, this

President: Dr. Anna Scott; Tel: 02 6648 3923; Email: Anna.Scott@scu.edu.au
Vice-President: Dr. Sarah Hamylton; Tel: 02 4221 3589; Email: shamylto@uow.edu.au
Hon Secretary: Ms. Carrie Sims; Tel: 0408 710 175; Email: c.sims@uq.edu.au
Hon Treasurer: Dr. Stephanie Duce; Tel: 07 4781 5476; Email: stephanie.duce@jcu.edu.au

would also provide a useful baseline from which monitoring studies could track the efficacy of protection measures put in place.

Initiative 3: Planning for climate change

We commend the NSW Government on including an initiative directed at addressing climate change. Protection from fishing pressure and water pollution can provide marine ecosystems with resilience to the impacts of climate change (Bates et al. 2014). However, this initiative is ultimately destined to fail unless the Australian Government steps up actions to reduce carbon emissions in line with the Paris Agreement (COP21). Thermal coal extracted from Australia will significantly increase global carbon emissions, whether it is burned here or elsewhere. These impacts directly threaten the NSW marine estate. Specifically, the East Australian Current is currently warming two to three times faster than the global mean under climate change, making eastern Australia a potential hotspot for warming and subsequent biological alteration and ecological modification (Verges et al. 2014). This process is predicted to increase in severity and frequency (Suthers et al. 2011), significantly impacting the biodiversity within the NSW marine estate. We therefore need the Australian Government to take responsibility and act now on a national level. Also, the support of scientific research endeavouring to understand how the NSW marine estate will respond to a changing climate is essential if we are to better inform decision-making and planning into the future.

Initiative 6: Ensuring sustainable fishing and aquaculture

We question the finding that TARA ranked pollution, among others, before fishing as the main threat facing the NSW marine estate. Any environmental threat should not hold reduced importance based on perceived social or economic benefits. There is overwhelming evidence showing increases in fish populations when no-take zones are enforced, including in NSW waters (e.g. Edgar et al. 2014, Harasti et al. 2018, Turnbull et al. 2018). We also highlight the benefits of sanctuary zones to recreational and commercial fishers because of the spill-over of fish, which often enhances catch in adjacent areas (Harrison et al. 2012). Under the original proposal, only 2.4% of the bioregion is planned sanctuary zone. This represents the lowest area of no-take protection in Australia, compared with 7% in NSW's other six marine parks and 30% within the Great Barrier Reef Marine Park. No-take zones in accordance with the IUCN's recommended 20% to 30% can increase the marine park's productivity. We therefore support the inclusion of high-level protection and recommend an increase in the area designated as sanctuary zone.

We reject that proposed conservation zones can be considered as effective as sanctuary zones if the fishing of lobster and abalone are allowed. Evidence has shown that when lobsters are removed, sea urchins can take over and decimate important seaweed habitat, which are in decline throughout NSW (Ling et al. 2009). To avoid such trophic cascades, there is an urgent need to increase the protection of conservation zones to the status of sanctuary zones (where these critical species and habitats exist) and increase the area of sanctuary zones in general.

President: [Dr. Anna Scott](mailto:Anna.Scott@scu.edu.au); Tel: 02 6648 3923; Email: Anna.Scott@scu.edu.au
Vice-President: [Dr. Sarah Hamylton](mailto:shamylto@uow.edu.au); Tel: 02 4221 3589; Email: shamylto@uow.edu.au
Hon Secretary: [Ms. Carrie Sims](mailto:c.sims@uq.edu.au); Tel: 0408 710 175; Email: c.sims@uq.edu.au
Hon Treasurer: [Dr. Stephanie Duce](mailto:stephanie.duce@jcu.edu.au); Tel: 07 4781 5476; Email: stephanie.duce@jcu.edu.au

We urge the Minister to consider the above evidence and to return to a democratic process that works towards providing adequate protection for the unique coastal and marine communities of NSW.

Sincerely,

Dr Anna Scott
President, Australian Coral Reef Society

Submission prepared by Professor David Booth, Dr Sarah Hamylton, Dr Paloma Matis and Ms Samantha Goyen

References:

Bates, Amanda & Barrett, Neville & Stuart-Smith, Rick & J. Holbrook, Neil & Thompson, Peter & J. Edgar, Graham. (2014). "Resilience and signatures of tropicalization in protected reef fish communities". *Nature Climate Change*, 4.

Booth, D. J. & Sear, J. (2018). Coral expansion in Sydney and associated coral-reef fishes. *Coral Reefs*, 1-1.

Edgar, G. J., R. D. Stuart-Smith, T. J. Willis, S. Kininmonth, S. C. Baker, S. Banks, N. S. Barrett, M. A. Becerro, A. T. Bernard and J. Berkhout (2014). "Global conservation outcomes depend on marine protected areas with five key features." *Nature* 506(7487): 216-220.

Harasti, D., J. Williams, E. Mitchell, S. Lindfield and A. Jordan (2018). "Increase in relative abundance and size of snapper *Chrysophrys auratus* within partially-protected and no-take areas in a temperate marine protected area." *Frontiers in Marine Science* 5(208).

Hugo B. Harrison, David H. Williamson, Richard D. Evans, Glenn R. Almany, Simon R. Thorrold, Garry R. Russ, Kevin A. Feldheim, Lynne van Herwerden, Serge Planes, Maya Srinivasan, Michael L. Berumen, Geoffrey P. Jones (2012). "Larval export from marine reserves and the recruitment benefit for fish and fisheries." *Current Biology*, 22 (11): 1023-1028.

Lema, J. M., & Martinez, S. S. (Eds.). (2017). *Innovative wastewater treatment & resource recovery technologies: impacts on energy, economy and environment*. IWA publishing.

Ling, S. D., C. R. Johnson, S. D. Frusher and K. R. Ridgway (2009). "Overfishing reduces resilience of kelp beds to climate-driven catastrophic phase shift." *Proceedings of the National Academy of Sciences of the United States of America* 106(52): 22341-22345.

Saunders, A. (2017). Review of the sugarcane industry Biosecurity Plan and development of a grower Biosecurity Manual; final report 2014/088.

Smith S. D. A., Markic A. (2013) Estimates of marine debris accumulation on beaches are strongly affected by the temporal scale of sampling. *PLOS ONE* 8(12): e83694.

Suthers, I. M., Young, J. W., Baird, M. E., Roughan, M., Everett, J. D., Brassington, G. B., ... & Ridgway, K. (2011). The strengthening East Australian Current, its eddies and biological effects—an introduction and overview. *Deep Sea Research Part II: Topical Studies in Oceanography*, 58(5), 538-546

Turnbull, J. W., Y. S. Esmaili, G. F. Clark, W. F. Figueira, E. L. Johnston and R. Ferrari (2018). "Key drivers of effectiveness in small marine protected areas." *Biodiversity and Conservation* 27(9): 2217-2242.

President: [Dr. Anna Scott](mailto:Anna.Scott@scu.edu.au); Tel: 02 6648 3923; Email: Anna.Scott@scu.edu.au
Vice-President: [Dr. Sarah Hamylton](mailto:shamylto@uow.edu.au); Tel: 02 4221 3589; Email: shamylto@uow.edu.au
Hon Secretary: [Ms. Carrie Sims](mailto:c.sims@uq.edu.au); Tel: 0408 710 175; Email: c.sims@uq.edu.au
Hon Treasurer: [Dr. Stephanie Duce](mailto:stephanie.duce@jcu.edu.au); Tel: 07 4781 5476; Email: stephanie.duce@jcu.edu.au

Vergés, A., Steinberg, P. D., Hay, M. E., Poore, A. G., Campbell, A. H., Ballesteros, E., ... & Wilson, S. K. (2014). The tropicalization of temperate marine ecosystems: climate-mediated changes in herbivory and community phase shifts. *Proceedings of the Royal Society of London B: Biological Sciences*, 281(1789), 20140846.

President: Dr. Anna Scott; Tel: 02 6648 3923; Email: Anna.Scott@scu.edu.au
Vice-President: Dr. Sarah Hamylton; Tel: 02 4221 3589; Email: shamylto@uow.edu.au
Hon Secretary: Ms. Carrie Sims; Tel: 0408 710 175; Email: c.sims@uq.edu.au
Hon Treasurer: Dr. Stephanie Duce; Tel: 07 4781 5476; Email: stephanie.duce@jcu.edu.au