



Hawkesbury Shelf Marine Bioregion Assessment

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Submission to the NSW Government
Marine Estate Management Authority

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Preamble

The NSW Government is inviting comments on suggested initiatives ‘to enhance and conserve marine biodiversity in the Hawkesbury Shelf Marine bioregion while continuing to enjoy the benefits which the community derives from the bioregion.’[1]

The NSW Branch of the Australian Marine Sciences Association (AMSA) is pleased to submit its comments. AMSA is the peak representative body for marine scientists in Australia with about 1,000 members representing all disciplines and associated primarily with universities, museums and marine consultancy companies in addition to State and Commonwealth Government agencies. AMSA provides independent scientific comment on matters of relevance to marine science. We welcome the opportunity to provide scientific comment pertinent to the management initiatives which have been suggested in the Discussion Paper of the Hawkesbury Shelf Marine Bioregion Assessment.

AMSA response to the Management Initiatives

The discussion paper prepared by the Marine Estate Management Authority [1] proposes eight management initiatives. Our submission is directed to four of the management initiatives.

Initiative 1 : Improving water quality and reducing marine litter

Initiative 2 : On ground works for healthy coastal habitats and wildlife

Initiative 3 : Marine research to address shipping and fishing knowledge gaps

Initiative 4 : Spatial management for biodiversity conservation and use sharing

AMSA notes that all four of these management initiatives require new government funding [1]. We urge the NSW Government and the Marine Estate Management Authority to allocate resources to achieve the management initiatives and objectives identified in the Discussion Paper and in this submission to enhance and conserve biodiversity in the Hawkesbury Shelf Marine Bioregion.

Initiative 1 : Improving water quality and reducing marine litter

The objective under this initiative is ‘to reduce water pollution from catchments and litter entering the bioregion. We support this objective because water pollution from catchments has far reaching effects on the biodiversity of coastal regions [2].

Initiative 2 : On ground works for healthy coastal habitats and wildlife

The objective under this initiative is ‘to improve the health of coastal habitats and marine wildlife safety’. We support this objective because the health of coastal habitats and marine wildlife safety is critical for maintaining biodiversity and the resultant social and economic benefits. The high risk threats identified in the Threats and Risk Assessment (TARA) process are clearing, dredging and excavation activities; recreation and tourism; foreshore development; estuary opening/modified freshwater flows and impacts on cultural heritage and use.

We are concerned about the action to ‘develop an urban mangrove management policy to conserve mangroves while balancing environmental, social and economic outcomes’. A policy is to be developed to reduce red tape and to allow trimming and removal of mangroves, in particular trimming of mangroves to improve waterway views. The Discussion Paper [1] notes the importance of mangroves as habitat, nursery grounds, a source of detritus for estuarine and coastal food webs, and in providing protection from erosion. Mangroves are a critical public resource and have a key role in maintaining biodiversity. Mangrove habitats are under pressure from a growing population which seeks access to the coast for recreational and commercial pursuits. AMSA opposes any dilution of the existing protection for mangroves under the *Fisheries Management Act 1994* and any new policy which reduces protection of this critical public asset for the benefit of a few.

Initiative 3 : Marine research to address shipping and fishing knowledge gaps

The objective under this initiative is to address key knowledge gaps identified from the TARA process which result in high risks in the bioregion. The high risk threats are considered to be urban stormwater discharge; clearing, dredging and excavation activities; shipping; foreshore development; climate change; and lack of funding and support. The Discussion Paper proposes that research is needed into the impact of anchoring in deepwater habitats, wildlife disturbance, sediment resuspension in the lower Hunter swing basin, interactions between both recreational and commercial fishing and wildlife, and the effectiveness of novel mitigation measures. The underlying goal is to reduce the impacts of these high risk threats. AMSA supports research targeted at reducing the impacts of these threats.

However, in addition to research in the areas listed above, AMSA considers that other questions require research and further information to reduce the impact of high risk threats in the Hawkesbury Shelf Marine Bioregion, such as:

- catch and effort data in recreational fisheries
- more rigorous stock assessments are required and fisheries scientists need adequate resources to conduct ongoing stock assessments. It is impossible to assess an impact when this basic data is not available
- trophic cascade effects, including the impact of by-catch, which result from commercial and recreational fishing
- climate change is identified as a high risk and research is required to understand the consequences for marine biota eg. range shifts, the effects of acidification in the oceans, the effects of warming oceans on life history and behaviour
- the effects of microplastics in sediments
- the effects of large predators such as sharks and marine mammals on marine ecosystems and spatial use patterns of this important and iconic marine wildlife.
Research on aggregation, feeding or breeding sites of marine megafauna are particularly important for designing effective spatial management strategies for our valuable marine estate
- long-term monitoring projects to measure the effectiveness of MPAs.

Recreational fishing in Sydney has the lowest participation rate of any NSW region but, due to population density the highest number of participants [3]. Recent research has shown that most activities across many of the identified sites are non-extractive [4,5]. At some sites fishing can be as low as 2% of recreational use. This does not mean that fishing effort is necessarily low but the areas can be under extraordinary levels of pressures from crowds of people. Understanding and mitigating all forms of human use and managing conflicts between users should be a key concern for MEMA. In particular changes to tenure or concern about unknown changes, which are often negatively perceived, can also result in large fluctuations in numbers of people using a site. Before and after research to better understanding patterns of use as well as stakeholder perceptions at small spatial scales are critical for effective zoning to minimise conflict and reduce impacts on habitat and biodiversity.

The impact of anchoring on deep water habitats is identified as a question requiring further research but another a major impact on habitats within the region, especially in Sydney Harbour, is traditional yacht moorings. Chains from these moorings mechanically remove habitat leaving biologically poor scours in soft sediment habitats and seagrass beds. These areas can also be impacted by introduced marine pests which can develop and feed on fouling organisms that accumulate on lines and are also scrapped onto the bottom. Bungee style moorings or other forms of eco-moorings can reduce these impacts while also allowing for higher densities of yachts within safe harbours. More research is required on the environmental effects and benefits of different yacht mooring solutions

It is not clear from the Discussion Paper why invasive species have been overlooked as a high risk threat. Invasive species are a high risk threat to environmental, social and economic benefits of the bioregion. Invasive species may impact aquaculture operations, displace native biota and reduce biodiversity. For example, the invasive European fan worm *Sabella spallanzanii* has recently been recorded in the Hawkesbury Shelf Marine Bioregion at Botany Bay [6]. This species is a considered to have a reasonably high impact or invasion potential [7] and has been shown to inhibit settlement by other sessile invertebrates and inhibit nutrient recycling in soft sediments [8]. Research and monitoring are required to reduce the risk posed by *Sabella spallanzanii* and other invasive species.

The management initiative should be expanded to include marine research into other knowledge gaps in addition to shipping and fishing.

Initiative 4 : Spatial management for biodiversity conservation and use sharing

The objective under Initiative 4 is to ‘enhance the conservation of biodiversity and use sharing through spatial measures’ and to design a system of targeted marine protected areas (MPA) based on detailed analysis and community engagement.

The Discussion Paper declares that Initiative 4 would involve a network of MPAs, and/or a large-scale multi-use marine park and/or spatial closures to address particular stressors. The Discussion Paper acknowledges that the current system of aquatic reserves does not follow internationally recognised conservation planning principles - ie. comprehensive, adequate and representative (CAR).

AMSA considers that the only way to manage the threats and stressors identified in the TARA process, is to establish a large-scale multi-use marine park. The marine park must be based on CAR principles as specified under the National Representative System of Marine Protected Areas (NRSMPA). The primary goal of the NRSMPA is biodiversity conservation [9] which aligns with the NSW Government aim to enhance and conserve marine biodiversity in the Hawkesbury Shelf marine bioregion [1].

The 15 pre-identified sites [1] will not adequately mitigate the threats and stressors to enhanced biodiversity conservation as identified in the TARA process. A global study of the factors which make MPAs successful in generating socio-economic and biodiversity benefits for the community, concluded that at least four of the five 'NEOLI' (no take, enforced, old, large and isolated) features must be included in MPA design for a successful outcome [10]. MPAs are crucial for preserving ecosystem processes and trophic integrity: the key players and processes that underpin a healthy ecosystem [11,12]. A key shortfall in MPA design is that they are often piece-meal and far too small making them woefully inadequate for protecting trophic processes [13,14]. This applies to the 15 pre-identified sites. Even if the additional 44 sites identified in 2015 community and stakeholder engagement [1] were given protection, the approach remains piecemeal and not based on CAR principles. Some of these sites and existing MPAs could be included in a large-scale multi-use marine park. For maximum benefits, the area protected must be moderately large, and has been suggested at approximately 30% the total area managed [14]. We urge the Marine Estate Management Authority to establish a large-scale multi-use marine park in the Hawkesbury Shelf Marine Bioregion.

References

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