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Natural Resources Management Board

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10 September 2015

Committee Secretary
Senate Standing Committees on
Environment and Communications
PO Box 6100
Parliament House
CANBERRA ACT 2600

Senate inquiry submission: An inquiry into the threat of marine plastic pollution in Australia and Australian waters

Dear Sir/Madam,

Under the direction of the Commonwealth Government's Marine Debris Threat Abatement Plan and *Environment, Protection and Biodiversity Conservation Act 1999* (EPBC, 1999), the Adelaide and Mount Lofty Ranges Natural Resources Management Board (AMLRNRMB) in South Australia, have been conducting scientific research aimed at identifying and addressing key sources of marine plastics (and other sources) of pollution in oceanic and Gulf waters of South Australia. The current program, which commenced in 2010 funded through the Australian Commonwealth's Caring for Our Country grant scheme (CFOC), has continued into 2015, adopting a variant of the United Nations Environment Marine Debris Program (UNEP). This approach has facilitated compilation of a marine debris-plastic pollution biennial database which enables spatial comparisons at regional, state, national, and international scales. The scientific data and information generated by the program will be fundamental to inform:

i. the senate inquiry into the sources of marine plastics pollution in Australia and Australian waters, with reference to South Australian waters,
ii. the senate inquiry into the national sources of marine plastics pollution,
iii. the review and future development, management, outcomes and requirements outlined in the Commonwealth Marine Debris Threat Abatement Plan,
iv. requirements aimed to reduce the impacts of marine debris on wildlife and ecological communities, and
v. to identify and mitigate some of its potential threatening sources of marine plastics pollution facilitating elements listed under the EPBC.

The results from this work, further aim to assist the global frameworks and strategies outlined in the Honolulu Strategy: A global framework for Prevention and Management of Marine Debris (NOAA, UNEP, 2012).

This project was a collaboration between the AMLRNRMB, Kangaroo Island Natural Resources Management Board (KINRM) and the Northern and Yorke Peninsula, Natural Resources Management Board (NYNRM). The project was supported by Whale and Dolphin Conservation, the South Australian Museum (SAM), Department of Environment, Water and Natural Resources (DEWNR), OceanWatch Australia Ltd, regional and city councils, Clean-Up Australia, SeaLink and community volunteers.

In an attempt to address the senate inquiry, we have summarised the marine debris work, and have compiled two sections (below) that will assist the TERMS OF REFERENCE outlined by the senate.

For additional information on the reports and regarding the Adelaide and Mount Lofty Ranges NRM marine debris program please contact:

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Yours sincerely

Chris Daniels
PRESIDING MEMBER

TERMS OF REFERENCE

Due to the nature of the work compiled by AMLRNRMB, the terms of reference are divided into two sections:

SECTION 1: Current research of marine debris (marine plastic pollution) for Metropolitan Adelaide, Yorke Peninsula, and Kangaroo Island, South Australia.

SECTION 2: Management and Mitigation Strategies for Marine Debris in South Australia.

SECTION 1:

TITLE: Current research of marine debris (marine plastic pollution) for Metropolitan Adelaide, Yorke Peninsula, and Kangaroo Island, South Australia.

The current marine debris research (2010-2014) is presented as two scientific reports that identify the current sources of marine debris (pollution) for metropolitan Adelaide, regional Yorke Peninsula, and Kangaroo Island, South Australia. The study/s highlights the potential threats and impacts key marine and terrestrial sources of pollution (particularly marine-based plastics pollution) impose on local and extant marine taxa. Importantly, repeated sampling of 38 sites (12 metropolitan and 24 remote sites comprising 1 km beach transects), has facilitated useful spatial and temporal comparisons of the key sources of plastic (and other) pollutants found in urban and regionally remote coastal locations, and oceanic (high-energy) and passive (Gulf) environments. The report/s further provides a small case study that investigated ingestion of micro-plastics in the plunge feeding seabird, the short-tailed shearwater (*Puffinis tenuirostris*).

The reports are listed as follows and are attached to the current submission:

1. Peters, K. J., and Flaherty, A. (2011). Marine Debris in Gulf St Vincent Bioregion. Final Report to the Commonwealth of Australia. Adelaide and Mount Lofty Ranges Natural Resources Management Board. pp 113.

   Commonwealth report identification No: CC084026

2. Peters, K, J. and Flaherty, A (2013). Current impacts and threat abatement of marine debris within Gulf St Vincent: Re-assessment 2 years after preliminary monitoring. Final report to the Commonwealth Government of Australia (Commonwealth identification No: OC13-00496). Adelaide and Mount Lofty Ranges Natural Resources Management Board. Adelaide. 60 pp.

   Commonwealth report identification No: OC13-00496

As the scientific reports provide evidence of the litter based sources, distribution and potential impacts of marine-based plastics pollutants, we have provided a brief executive summary and recommendations of the key results from year 2010 and 2012/2013 marine debris programs. We further provide links to key sections within the reports (below) that directly address specific questions outlined in the terms of reference. These are:

TERM OF REFERENCE:

b) ***Sources of marine plastic pollution;***

c) *The impacts of marine plastic pollution, including impacts on species and ecosystems, fisheries, small business, and human health;*

Report 2: Peters, K. J., and Flaherty, A. (2011). Commonwealth report identification No: OC13-00496

RESULTS
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6.6 Fishing and boating debris (p. 40)
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Table 13: Number and mass (kg) of debris items and their potential risk impact (ingestion and/or entanglement) on marine species and ecological communities (p. 42).

DISCUSSION
7.3 Marine debris surveys and litter composition (p. 44)
7.4 Fishing and boating-related debris (p. 47)
7.5 Impacts to wildlife and biodiversity (p. 48)

Report 1: Peters, K. J., and Flaherty, A. (2011). Commonwealth report identification No: CC084026

RESULTS
3.5 Major pollution sources (p. 32)
3.6 Fishing, boating and aquaculture debris (p. 36)
3.7 Marine debris and impact to harm marine species and ecological communities (p. 37)
3.10 Ingestion of plastics by the Short-tailed shearwater (*Puffinis tenuirostris*) (p. 40)

TABLES
Table 10. Sites and major categories of debris collected (abundance) for each user group (p. 34)
Table 11. Summary comparisons of item abundance for the most common debris items collected from four of the six major debris user groups (p. 35)
Table 13. Marine debris with potential to cause harm to marine vertebrates either by ingestion or entanglement within the South Australian regions surveyed (p. 38)

DISCUSSION
4.3 Fishing, boating and aquaculture related debris (p. 45)
4.4 Impacts on wildlife and biodiversity from ingestion of marine debris (p. 46)
4.5 Impacts on wildlife and biodiversity from entanglement by marine debris (p. 48)

Current impacts and threat abatement of marine debris within Gulf St Vincent: Re-assessment 2 years after preliminary monitoring.

EXECUTIVE SUMMARY AND RECOMMENDATIONS

1. The cross-regional research program involving three Natural Resource Management boards (Northern and Yorke, Kangaroo Island and Adelaide and Mount Lofty Ranges) sought to identify the potential sources of harmful marine debris through beach litter collections and consequently determine current issues and ascertain the knowledge gaps affecting the bioregion. The project further investigated the role of key stakeholders in developing a coordinated state-wide strategic plan to facilitate mitigation of some of the sources of marine debris.

2. Overall, 38 study sites across five broad regions were surveyed by volunteers for marine debris; West GSV, East GSV, Lower Yorke Peninsula, Fleurieu Peninsula and Kangaroo Island. In total, 24,788 (12,185 items and 941 kilograms in 2012 and 12,603 items and 985 kg) of marine debris was collected categorised, and quantified. Overall, the number of items, mass and density of marine debris between regions was not significantly different between years.

3. The largest proportion of marine pollutants as items recovered in the studies comprised plastic (88.4%) which comprised 90% of the type of litter at each site. Glass and ceramic-based fragments were the most common items found when plastic was not the major debris component at a site.

4. When key polluting sources were identified, five main litter groups were apparent comprising micro-plastics and larger plastic fragments, plastic containers, recreational and commercial fishing and boating plastic debris, plastic food packaging, and general household products.

5. The key items that significantly contribute to marine pollution in the Gulf St Vincent, Kangaroo Island and Yorke Peninsula in order are: hard-polymer micro and larger plastic fragments, plastic rope pieces (and larger lengths) associated with commercial and recreational fishing and boating practices, plastic PET drink bottle caps and plastic drink container lids, plastic PET bottles, plastic food and confectionary wrappers, plastic straws, and at the time of survey; disused plastic aquaculture oyster pot debris.

6. Spatially, sites exposed to open oceans exhibited high litter counts exacerbated by plastic fragments, plastic bottle lids and recreational and commercial fishing and boating-related plastic rope items.

7. The Adelaide metropolitan region showed the highest counts of urban-based plastics debris predominantly comprising plastic food wrappers, plastic PET drink bottle caps and lids, and assorted plastic bags.

8. Plastic rope pieces and a large bundle of commercial fishing rope found at Cape Gantheaume, Kangaroo Island contributed to commercial and recreational fishing and boating litter. Additionally, a large number of commercial oyster baskets were recovered from disused oyster farm sites.

9. Our necropsy results revealed of 23 short-tailed shearwater sampled, 70% contained between 1 - 12 pieces of hard-polymer plastic fragments or silicone beads within the gastrointestinal tract.

RECOMMENDATIONS

10. Standardise marine debris sampling protocols and methodology to ensure consistency and comparability of datasets between state, national and international agencies. This will assist the development of a national coordinated strategic plan to mitigate harmful effects of marine debris.

11. There is a clear inadequacy in the funding and resources available to implement and supplement on-ground surveys of marine debris across the state of South Australia. Furthermore, there is need for a national program to integrate community action on marine debris (both monitoring, assessment and cleanup) with the work by government and industry to achieve improved debris policy and product stewardship

12. There is clear need to update the National Marine Debris Threat Abatement Plan (TAP). The current TAP is primarily concerned with risks to vertebrate species (e.g. cetaceans, sharks and turtles) however; scientific evidence suggests the compounding effects of marine debris impacts across all trophic levels and ecological communities.

13. There is clear evidence and need to remediate and reduce the quantity and impact of plastic PET drink bottle caps (e.g. water, soft drink) entering the GSV bioregion. The cash-for-bottles program facilitates ethical bottle recycling, but due to differences in plastic compositions between bottles and their lids, compatibility during the recycling process is currently limited. Plastic compatibility between bottles and their lids, or a cash-deposit-recycling scheme on plastic bottle lids could alleviate some of the impacts of bottle lid debris on the environment.

14. There is clear evidence and need to reduce the impacts of rope-based debris and fragments thereof associated with commercial and recreational fishers and boaters. Remediation of rope should include the development of awareness campaigns, preventative measures or investigation of product alternatives to reduce the impact of rope across the GSV bioregion. Additionally, there is need to focus on mitigation processes that can differentiate end users such as commercial and recreational fishers and boaters.

15. The wide diversity of litter emphasises the shared responsibilities of local, regional and state agencies to inaugurate better management strategies for the minimisation and reduction of anthropogenic-generated litter. The prevalence of plastic bottle lids, food wrappers and plastic bags underscores the importance of mitigation and remediation to focus efforts on improving local waste reception processes particularly in urbanised environments. Furthermore, there is clear need to offer industry incentives to facilitate production of 100% biodegradable products and reduce 'at source' non-degradable plastic-based items.

16. Continued efforts to improve waste management practices on land and at sea, particularly through regional and local review and improvement of port, boating hub and beach (and catchment) waste and recycling facilities, including awareness of best practice waste management for vessels, and improving solid pollutant (litter) control strategies in waterways.

17. There is significant need for better awareness and preventative measures to reduce gear loss, and present biodegradable or alternatives to the plastic components used by commercial and recreational fishers and boaters. For recreational fishers and boaters, direct mitigation could include better fishing waste reception facilities at fishing hotspots (e.g. boat ramps and jetties) facilitated through fishing education and litter mitigation programs such as the Hook, Line and Thinker program initiated in South Australia.

SECTION 2:

TITLE: Towards a national strategy for marine debris monitoring and assessment: a report on the South Australia Marine Debris Forum, May 2013

As part of OC13-00496 (report 2, Peters and Flaherty (2013)), a synthesis report highlighting "Management and Mitigation of Marine Debris in South Australia" was also developed. The meeting was convened and facilitated by the Adelaide Mount Lofty Natural Resources Management Board with representation from NRM Boards across South Australia as well as from the Commonwealth Government (Department of Sustainability, Environment, Water, Populations and Community), CSIRO, a range of SA Government Departments (PIRSA, EPA, DEWNR), Local Government and industry (fishing industry, waste and recycling sector).

The synthesis report is listed as follows and attached to the current submission:

Cheshire, A.C. (2013). Towards a national strategy for marine debris monitoring and assessment: a report on the South Australia Marine Debris Forum, May 2013. Prepared for the Adelaide Mount Lofty Natural Resources Management Board by Science to Manage Uncertainty pp: 18+iii

Commonwealth report identification No: OC13-00496

The proceedings of the workshop are summarised in the Executive Summary below:

Towards a national strategy for marine debris monitoring and assessment: a report on the South Australia Marine Debris Forum

EXECUTIVE SUMMARY

1. Marine debris is a global problem with the potential to have significant environmental, social and economic impacts ranging from impacts on key wildlife species and habitats, the loss of amenity, impacts on indigenous communities, losses to tourism, fishing and aquaculture industries, hazards to shipping and transport industries and threats to public safety.

2. There has been a strong focus on developing effective methodologies to support the quantitative assessment of marine debris problems.

3. That while Australia recognises these risks, and has developed a National Threat Abatement Plan (TAP), the current focus of the Plan is primarily concerned with risks to vertebrate species (e.g. cetaceans, sharks and turtles) and needs to be extended to all trophic levels and ecological communities.

4. The TAP does not adequately frame either the data needs or the mitigation strategies that may be developed to respond to the broader environmental, social and economic issues presented by marine debris.

5. Key strategies in responding to marine debris involved a closer engagement with stakeholders including both industry and the community, as coastlines and the marine environment are a shared resource.

6. Even though a large quantity of marine debris data exists, there is a recognised need to standardise marine debris sampling scientific methodology across the state and nationally to ensure the accuracy of results and facilitate state and international consistency.

7. There is a clear inadequacy in the funding and resources available to implement and supplement on-ground surveys of marine debris across the state of South Australia.

8. There is need for a national program to integrate community action on marine debris (both monitoring, assessment and cleanup) with the work by government and industry to achieve improved debris policy and product stewardship.

In summary the forum agreed that a national or state program to monitor marine debris was essential if we are to better:

1. Develop policy frameworks to improve the management of marine debris sources, risks and impacts;
2. Determine the long term resource needs to effectively deliver such a program at local, regional and national scales;
3. Identify the major risks and impacts from marine debris on the maintenance of natural resource condition and on social and economic values;
4. Identify loss and discard processes and how these lead to waste items ending up as marine debris;
5. Implement a standardized marine debris monitoring and assessment program to provide a basis for long-term regional comparisons to both determine the scope and scale of current problems and to measure the relative success of management and mitigation strategies.
6. Identify opportunities to improve how changes in product stewardship (e.g. deposit legislation) will mitigate the impacts from debris;
7. Develop strategies to better engage stakeholders in the management and prevention of marine debris;
8. Identify behaviours and social and cultural values that will either exacerbate or mitigate the marine debris problem.