

Friday 9th October, 2015

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



By email to: ec.sen@aph.gov.au

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

Dear Committee Secretary,

OceanWatch Australia (OceanWatch) is pleased to provide a submission to this inquiry.

OceanWatch works to advance environmental, economic and social sustainability in the Australian fishing and aquaculture industry, and promotes awareness, stewardship and action within other parts of the community that use and value the marine environment.

In 2014 the Australian Government recognised OceanWatch as the national organisation responsible for the delivery of its marine Natural Resource Management (NRM) related programs. Through a National Landcare Program funding agreement, the Australian Government assists OceanWatch to achieve mutually agreed long term outcomes for the marine environment.

OceanWatch recognises the potential for major impacts of plastic pollution on marine species and ecosystems, human health, and marine industries and communities. Plastics that are not appropriately recycled or disposed of on land often end up in our waterways with limited potential for recovery as they degrade. Similarly, the negative impacts from lost fishing gear and other marine industry generated plastic debris is well known.

We support efforts at all levels to prevent plastics entering our waterways and marine areas, and to remove accumulated debris. As a response to the issue, OceanWatch has developed and delivered programs focused on improving waste practices within the fishing (commercial and recreational) and aquaculture sectors, and conducted targeted marine debris cleanups in partnership with the seafood industry and local community in numerous locations around Australia over many years. We have also conducted our own beach and fishing location surveys, as well as collaborated with others on plastic debris research since 1999.

1. Sources of Plastic Pollution

Types of plastic pollution found in the marine environment include plastic bottles and bags, lost fishing gear, fragments as these materials (ie. micro plastics), as well as microbeads and nurdles used in products for household and cosmetic use.

The Great Barrier Reef Marine Park Outlook Report 2014¹ found plastic bottles, bags and fishing gear among the most common items, and that plastic makes up the majority of pollution on beaches. 683,000 items of debris of more than 42 tonnes were collected from the GBR between 2008 and 2014. 90% of debris ingested by marine turtles in Queensland is plastic - some turtles are found to have ingested plastic from hundreds or thousands of kilometres away. Lost or discarded plastic fishing gear can also cause harm by entanglement to marine fauna, particularly seabirds and turtles. The natural beauty of the GBR is also affected by visible plastic pollution, particularly on beaches.

Research from Clean up Australia estimates 3.9 billion single use plastic supermarket bags are used by consumers each year². This does not include bags sourced from smaller retailers. Plastic beverage containers were the no. 1 rubbish item in their 2014 clean up year from various sites and contributed 34.05% of all plastics collected. Beverage related rubbish has increased each year for the past 23 years.

Microplastics are plastic pieces less than 5 mm in diameter and can include fragments of larger items, pellets and flakes used in products and tiny beads used in abrasive products for personal or household use.

The Sydney Institute of Marine Science found microbead pollution in Sydney Harbour at 27 sites in Middle Harbour. Findings from a study³ conducted by the University of Western Australia and CSIRO, using surface water tows at 57 sites, show most plastic particles were fragments of polyethylene and polypropylene from such items as plastic bottles and fishing gear. The highest concentrations were found around the Eastern seaboard at Sydney and Brisbane suggesting local sources, but additionally there were also high concentrations around South West Tasmania and the North West Shelf which suggest international or shipping operations as sources. The study also noted Australia uses nearly 1.5m tonnes of plastic a year, with only 20% of it recycled.⁴

Anecdotally, there is also a growing use of inorganic and partially inorganic (polyester fibres) in soil erosion and weed minimization textiles. These materials are used in large scale environmental, building and horticultural projects routinely. They are designed to reduce soil erosion but inadvertently release large amounts of fibres into stormwater systems, creeks and rivers, ending up in the marine environment.

Recent CSIRO research suggests most plastic pollution is from domestic sources and is concentrated around cities. 75% of marine debris is plastic and generated terrestrially 'most is from Australian sources, not the high seas, with debris concentrated near cities.'⁵

¹ <http://www.gbrmpa.gov.au/cdn/2014/GBRMPA-Outlook-Report-IN-BRIEF-2014/>

² http://www.cleanup.org.au/PDF/au/cua_plastic_bags_fact_sheet.pdf

³ Marine Plastic Pollution in Waters around Australia: Characteristics, Concentrations, and Pathways Julia Reisser, Jeremy Shaw, Chris Wilcox, Britta Denise Hardesty, Maira Proietti, Michele Thums, Charitha Pattiaratchi Published: November 27, 2013

⁴ PACIA (2011) National plastics recycling survey (2010-11 financial year). 53 p.

⁵ <http://apo.org.au/research/understanding-effects-marine-debris-wildlife>

There seems to be some inconsistency regarding the above statement and the experience of other organisations regarding the “major” sources of plastic marine debris. OceanWatch's experience indicates the contribution from overseas sources is potentially significant and underestimated. In relation to micro plastics, it is difficult to accurately assess source items and origins. Assumptions based on observations of micro plastics debris, parent material the debris may have originated from, its mainstream usage within Australia and the other waste matrix commonly found together on beaches indicate potential for significant international sources.

In the case of plastic bottles, further evidence can be found in barcodes where the trademark of product registration originates from countries in the Pacific and Southern East Asia. Plastic debris is often mixed with other materials (labelled drift wood, parts of boats, coconuts, pumice from specific volcano events etc), where the origin suggests international sources. Ocean current and tidal patterns provide another predictive indicator of source and transportation, suggesting international contribution is a significant occurrence at some locations on our coastline.

There seems a reluctance to acknowledge and address the contribution of plastic waste from international sources. The current domestic environmental policy focus and funding mechanisms seek to tackle the problem through monitoring and cleanups within Australian boundaries. Little effort that we are aware of is applied within potential source countries.

2. Impacts of Plastic Pollution

It is estimated that approximately one million sea birds and 100,000 marine mammals are killed annually from plastic in our oceans.⁶

The major impacts of plastic pollution in the marine environment include:

Entanglement and ingestion

Entanglement in plastic debris can cause physical injuries and death to marine mammals, sea birds and turtles. At least 77 species of marine wildlife found in Australian waters and at least 267 marine species worldwide are affected by entanglement in or ingestion of marine debris.⁷ Ingestion can cause malnutrition and starvation through physical blockage of the digestive system, particularly for sea birds and turtles. Petroleum-based plastics like PET do not decompose through biological processes. Instead sunlight breaks the plastic down into tiny pieces through photo degradation. This process removes the visual aspect of plastic pollution, however, it still remains in the environment where it can be accumulated by marine life, and passed on to those that consume these products.

Alarmingly, there is increasing evidence of plastics entering seafood commodities. Research in Europe has found oysters and mussels with concentrations of microplastics not only in their gut, but also entering the circulatory systems of these bivalves. Stomach contents of commercial fish species have also been found to contain plastic fragments.

⁶ Faris, J&K Hart (1995) *Seas of Debris: A summary of the Third International Conference on Marine Debris*, Alaska Fisheries Science Centre, National Oceanographic and Atmospheric Administration

⁷ GhostNets Australia

Even coral is at risk, a recent study at JCU found that corals ingest plastic at only slightly lower rates than their normal feeding rate, mistaking microplastics for zooplankton⁸.

Accumulation of toxins within the food chain

Plastics are a source of PCBs and other harmful toxic chemicals similar to DDT. When they are ingested as micro plastics they are released into the flesh by the digestive system and accumulated within the food chain. Some harmful chemicals are also known to adhere to the surface of microplastics, providing a mechanism for these contaminants to enter the foodchain.

Transport of invasive species

Plastic debris can travel large distances; invasive species have the potential to be translocated via plastic debris with a subsequent increase in bio security risks.

Additional burden for land managers

Agencies including National Parks and local councils are constantly battling with a problem for which they are provided limited resources to address, and with no solution in sight. Addressing marine debris can take scant resources away from other, more fundamental, organisational roles and services.

3. Mitigation

The three mitigation measures which would have the most impact in reducing plastic pollution within the marine environment from domestic sources are:

A national deposit and refund system for plastic bottles.

Putting a value on the return of packaging after the consumption of the contents provides an economic motivation for appropriate disposal. The deposit amount would need to be a significant incentive to ensure plastic bottles are returned. Previous bottle deposit schemes for glass soft drink bottles in the 1970's were approximately 1/3 of the cost of the item (5c deposit for a 15c drink). Translated into today's market it would equate to around \$1 per plastic bottle.

Transition from single use PET plastic bags (checkout bags and bin liners) to bio-degradable packaging.

There are many alternatives to single use plastic bags; major retailers such as Bunnings and Aldi already operate without them. Additionally, an environmental levy on PET plastic products could contribute to environmental clean-up activities and/or recycling.

Resourcing Non Government Organisations that work with community groups to link materials found to source reduction plans.

Without linking on ground experience with source reduction planning the plastic debris issue is unlikely to be addressed successfully.

Further potential mitigation measures regarding domestic land based sources include:

- Linking the results of the CSIRO and Tangaroa Blue databases (beach survey data).

⁸ Microplastic ingestion by scleractinian corals by N.M. Hall, K.L.E. Berry, L. Rintoul, M.O. Hoogenboom is published in the journal Marine Biology

- Supporting community education regarding the harmful impacts from plastic debris to increase the responsible disposal and recycling of plastic - an updated "Do the Right Thing" campaign to raise awareness.
- National co-ordination of the cleanup of marine debris from our coasts and offshore areas and promotion of stewardship of these areas amongst the Australian community.
- Increased and improved filtration for stormwater to prevent plastics from entering waterways during rainfall.
- Banning the use of micro beads in household and cosmetic products or alternatively banning their discharge from sewerage treatment plants.
- Regulating the use of inorganic weed minimisation/ soil erosion textiles including targeted education around the secondary problems associated with using plastic based weed minimisation/ soil erosion textiles in landscaping, horticulture and home gardens.
- Supporting "Truth in labelling" for plastic goods as either bio- or photo-degradable to support consumer decision making .

Potential mitigation measures regarding domestic marine based sources include:

- Providing appropriate disposal facilities at fishing ports, boat ramps and popular fishing spots.
- Supporting stewardship programmes with commercial and recreational fishers and the aquaculture industry designed to promote responsible use of plastics and improved disposal of waste.
- Requiring all packaging of bait for commercial and recreational fishers to be bio-degradable or to be removed prior to entering waterways.

Potential mitigation measures regarding international sources include:

- Dedicated government representation with other countries on the issue of marine plastic debris, similar to climate change delegations.
- Supporting aid organisations working in developing countries to progress source reduction strategies

4. Monitoring

Additional research and monitoring is required in the following areas:

- Identification of hot spots and debris movement due to currents and weather conditions to aid in targeting of clean ups
- Bio accumulation and effects on ecosystem health
- Bio accumulation and effects on seafood for human consumption
- Biodegradable alternatives for the manufacture of recreational fishing netting, line & tackle

5. Other Matters

A further issue of concern for OceanWatch is the amount of abandoned or lost fishing gear that is unable to be lawfully removed from the environment.

Fisheries management regulations preclude anybody, other than the owner, from interfering with set fishing gear. While these regulations are obviously intended to reduce pilfering of gear and catch, in the case of an abandoned crab trap constructed with nylon mesh for example, this can mean the trap is unable to be removed from the environment by someone other than the owner or a fisheries compliance officer even if it has become a piece of "plastic debris".

6. On-ground Responses

OceanWatch has delivered a suite of on ground responses over many years, including:

SeaNet environmental extension program (SeaNet 1999/2013)⁹

Most Codes of Practice (CoP) and Environmental Management Systems (EMS) developed by the seafood industry have been facilitated by the SeaNet program (~70). The development and extension of the CoPs and EMS include information relevant to MARPOL (eg. ban on disposal of plastics at sea), as well as best practice techniques to reduce the incidence of lost gear and minimise impacts on protected species. Extension of best practice through working in collaboration with the seafood industry has resulted in significant reductions in plastic debris eg. the removal of plastic strapping from bait boxes within the Western Rock Lobster fishery.

Numerous marine debris clean ups have been facilitated by SeaNet utilising the knowledge, skills and equipment of commercial fishers, aquaculture producers and seafood organisations. Cleanups often target remote or difficult to access areas such as islands, mangroves and shorelines. Multi agency partnerships such as the Darwin Harbour Cleanup have been created and continue as a legacy of the program.

The SeaNet program provided links between commercial fishers, the Carpentaria Ghost Nets program and Indigenous rangers in remote northern Australia.¹⁰

Responsible crabbing campaign Qld

The campaign targeted the use of cheap recreational crab "dillies". The dillies are constructed of monofilament mesh net material and are designed to entangle crabs, as opposed to trapping them. Experience has shown large numbers of these devices are lost by recreational fishers, accumulate within the marine environment and continue ghost fishing indefinitely, becoming an entanglement threat for turtles as well as other marine life. The campaign consisted of community outreach at seafood festivals as well as television commercials on regional Qld television stations.

⁹ <http://www.oceanwatch.org.au/wp-content/uploads/2010/01/Seanet-Brochure-Web.pdf>

¹⁰ <http://www.oceanwatch.org.au/seanet/seanet-programs-by-state/seanet-queensland/carpentaria-ghost-nets-program/>

T'Angler Bins¹¹

OceanWatch has distributed over 350 T'Angler bins throughout NSW and Qld. The bins are installed at popular fishing spots and boat ramps and maintained by local councils, recreational fishing clubs and other organisations. They are designed to be both a collection point for discarded fishing line, and a visual reminder to responsibly dispose of fishing line.

Yours sincerely

OceanWatch Australia

¹¹ <http://www.oceanwatch.org.au/our-work/tangler-bin/>