

## **Senate Inquiry: The threat of marine plastic pollution in Australia**

**Closing date for submissions: 10 September 2015**

### **SUBMISSION TO:**

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

*\*Submissions made online via [http://www.aph.gov.au/Parliamentary\\_Business/Committees/OnlineSubmission](http://www.aph.gov.au/Parliamentary_Business/Committees/OnlineSubmission)*

### **SUBMISSION BY:**

**Terrie Ann Johnson**  
**Clean up Australia**  
**193 Darlinghurst Road**  
**Darlinghurst NSW 2010**  
**01 8197 3403**

### **Context CUA and Litter**

***“What you've got to realise - whatever you drop on a mountain or in a creek or on the beach or in the street or in the paddock is eventually most likely to end up in the ocean, the ultimate receiving waters.” Ian Kiernan AO Founder and Executive Chairman of Clean Up Australia***

Marine Debris, and in particular the proliferation of plastic in the world's oceans has always been a priority for Clean Up Australia and Clean up the World; in fact the inspiration for founding Clean Up Australia back in 1989 was our Founder and Executive Chairman, Ian Kiernan AO experience during the BOC Challenge Round-the-world Yacht Race, where Ian was shocked and disgusted by the pollution and rubbish that he continually encountered in areas such as the Sargasso Sea in the Caribbean.

Today, Clean Up Australia and global event, Clean Up the World, inspires and supports the efforts of some 40 million volunteers across 130 countries to take action by cleaning up their local beaches, natural areas, parks and streets.

Marine plastic pollution is a growing global threat to biodiversity and is already having a devastating impact on the Australian environment with significant potential to disrupt our lifestyle and lead to substantial economic loss.

Government is long overdue in recognising that a major failing of policy to tackle marine debris, and in particular, marine plastic pollution has (to date) been the excessive focus on international and 'at sea' generated waste.

Certainly, marine debris is a global problem where we experience international waste migrating to our shores (just as our marine plastic pollution in turn impacts many nations) and specific shipping and fisheries related challenges (e.g. ghost nets) create specific threats to our environment and communities.

However, it is critical that Australian Government and its jurisdictions realign our policy responses to address the vast majority of marine plastic pollution - waste plastic packaging and products that enter the litter stream in our cities and towns, captured via the storm water system and swept to sea.

Research shows that a significant amount of plastics that enter the marine (and terrestrial) environment comes from the everyday activities of Australians. The distribution of plastic marine pollution is within the control of Australian and state governments and can be acted on immediately.

This major environmental issue is generating increasing community concern and can be addressed through effective and practical government policies, which have the potential to reduce 70% of this material from the environment within a 3-5 year window. Suggested mechanisms that will significantly reduce marine plastic debris include:

- the introduction of a national Container Deposit System, which would reduce beverage litter of the marine environment by 60% and almost triple bottle and can recycling rates to 85%
- The banning of single use singlet style (lightweight) plastic bags and microbeads, both items which are commonly mistaken as food by marine life, will have a drastic impact on the number of these items entering the marine environment
- Improved stewardship with the plastic industry is also a vital step toward reduction of marine plastic, as manufacturing industries can play an important role in ensuring nurdles do not escape and enter the sea during manufacturing.

Clean Up Australia welcomes the Senate Inquiry into the threat of marine plastic pollution in Australia. Our submission focuses on what we see as the core source of the problem – litter and the most effective actions to fix it.

### **The Problem is Rubbish**

Over the past 25 years Clean Up Australia Day has seen Australians volunteer some 28.75 million hours to remove over 302,213 tonnes of rubbish across the country. While Clean up Australia is not a specialist in public policy the experience of our volunteers provides a unique point of view on the problem of rubbish in Australia.

Despite these incredible efforts, and the investment of hundreds of million dollars of tax payers money to install and service litter bins, gross pollutant traps along with street and beach sweeping, rubbish remains the #1 environmental issue most commonly confronting our society.

While volunteer and infrastructure efforts are commendable and are having an effect on the problem, we have arrived at a number of inescapable conclusions over the past 25 years:

1. Addressing the problems of rubbish at the point of consumption is a far more cost effective approach than trying to recover packaging and products once they have entered our environment &
2. Any plastics we throw away will eventually enter our waterways and poison our oceans and seas.

A snap shot of the materials we recover every year reinforces this conclusion:

- 🗑️ Plastic rubbish is the most common material our volunteers recover – representing well over 30% of all materials collected.
- 🗑️ Over the past 5 years, beverage related rubbish (bottles, cans, lids, straws etc.) represents 36.92% of all items collected on Clean Up Australia Day (and 30.2% of all plastic).
- 🗑️ Over the 23 years that Clean Up Australia has been collating data from Clean Up Australia Day we have seen beverage litter growing consistently. In 2013 it reached the point where beverage rubbish replaced cigarette butts as the most common product group removed by volunteers. This trend that has continued through 2014 and 2015.
- 🗑️ Detailed studies of the materials removed on Clean Up Australia Day in 2014 found while plastics were significant in every type of site, the proportion of plastic materials recovered at beach and waterways was some 20% more than the amount found at other sites<sup>1</sup>. Dive sites reported 50% of rubbish removed was plastic. This highlights the strong potential for plastics to migrate into our waterways via wind and storm water systems.

While it is unclear exactly how much plastic pollution enters our marine environment each year, recent research and data compilation by both the CSIRO and other groups indicates that both the vast majority (around 75%<sup>2</sup>) of Australian marine debris is plastic, is generated terrestrially and is local in its nature. The CSIRO has stated that “most (marine debris) is from Australian sources, not the high seas, with debris concentrated near cities”.

Consistent with this analysis and our experience cleaning up; a recent study undertaken in 2014 by The Norwegian Environment Agency undertook an analysis to identify the sources of microplastics found in their seas<sup>3</sup>. While the results are indicative only, it is notable that the migration of litter (and microliter) from land based sources is the dominant stream of marine plastic pollution – some 63% of all marine microplastics<sup>4</sup>.

This reinforces the fact that while it is important to address growing concerns regarding microbeads and nurdles (the plastic resin pellets and flake used in plastics manufacturing) as well as maritime rubbish (ghost nets, fishing gear etc.) any policy responses which allow plastic packaging to continue to grow unchecked is unlikely to drastically reduce the incidence of marine plastic pollution.

A summary chart of the sources identified in the Norwegian study are as follows:

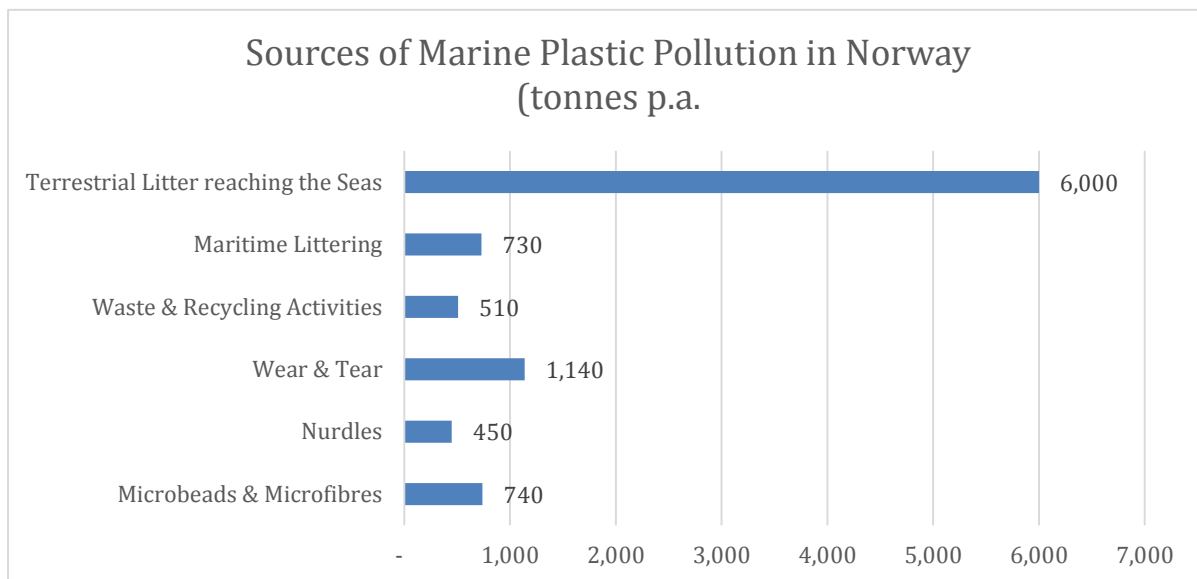
---

<sup>1</sup> NB We removed schools as a site for this analysis as they often have policies of not selling products in glass packaging and have social policies that alter the patterns of beverage consumption.

<sup>2</sup> Britta Denise Hardesty, Senior Research Scientist for CSIRO: ‘We found about three-quarters of the rubbish along the coast is plastic.’ <http://www.csiro.au/en/News/News-releases/2014/Plastic-on-the-coasts-is-ours>

<sup>3</sup> See: Sources of microplastic- pollution to the marine environment

<sup>4</sup> NB Microbead and Nurdle estimates are likely to be understated due to the large proportion found in marine sediment rather than the water itself estimates represent



**Listen to the Community:**

While we have seen constant debate on the most effective way to address marine plastic pollution and rubbish generally over the past 10 years, the public has a very clear view on the problem.

The following Omnipoll (the new name for Newspoll) was commissioned by the Boomerang Alliance to conduct a poll which included the question **“Are you concerned about the impacts of plastic packaging on the environment?”** in July this year. The results highlight the high levels of concern the community has about plastics packaging:

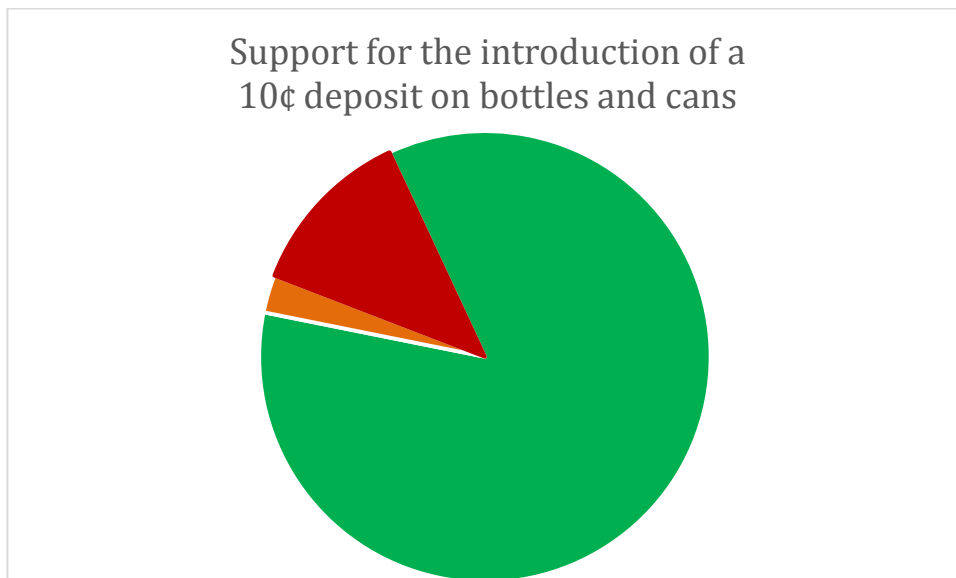
	National 1266	Male 629	Female 637	Grocery Buyer – 1096	NSW 369	QLD 212	SA/NT 159
<b>WTD Resp</b>	14746	7370	7376	13163	4929	2945	1205
<b>Yes %</b>	69	67	72	72	72	73	75
<b>No %</b>	20	21	18	19	15	17	15
<b>Unsure %</b>	11	12	10	9	13	9	10

Market research by Newpoll (both for the Boomerang Alliance and Clean Up Australia) has consistently shown very high levels of support for a CDS over a 10 year period. The polls make it clear that there is a cost yet consistently poll 85+%. The most recent results (Feb 2015) are found below:

*Question: Thinking now about recycling and litter. **South Australia** currently has a deposit and refund scheme, where 10 cents is added to the cost of bottled and canned drinks. The 10 cents is **refunded**, when people return empty bottles and cans to recycling collection depots.*

*The New South Wales government is set to introduce a container deposit system using reverse vending machines which automatically separate glass, metal and plastic containers and provide the deposit refund.*

*Do you personally think the (State) government should or should not introduce a deposit and refund scheme for bottles and cans, in (state).*



Green [YES] = 85.10%; Red [NO] = 12.2% and Don't Know [Orange] = 2.7%

### **Cost of Litter / Marine Debris**

A key issue surrounding the debate on what policy measures to adopt is the cost. Significantly, when assessing the costs there is a strong tendency to undervalue the benefits, or the time and effort by the community effort to reduce our marine plastic pollution.

One recent example is the 2014 Packaging Impacts Decision RIS, that firstly reduced previous efforts to understand the cost of litter to society from an estimated \$350million p.a. to just \$38million p.a. and then identified a CDS (option \$A) would reduce the amount of litter by some 8722,000 tonnes but only attributed some \$7.8million p.a. benefit.

This is nothing like the reality. While there are better qualified organizations to discuss the economics of litter abatement, we provide the following snapshot of the economic cost of simply holding Clean Up Australia Day:

<b>ASPECT OF CUAD</b>	<b>COST</b>
<b>VOLUNTEERS</b>	\$32,744,394.00 <sup>5</sup>
<b>DIRECT EVENT RELATED EXPENDITURE BY CUA</b>	\$804,610.00
<b>SHARE OF MANAGEMENT &amp; ADMINISTRATION</b>	\$667,433.00
<b>PRO BONO SERVICES</b>	At least \$1,000,000 <sup>6</sup>
<b>TOTAL:</b>	<b>\$35,216,437.00 P.A.</b>

<sup>5</sup> Assumes the average wage rate of \$31.11/hr X the estimated 1,052,536 volunteer hours on CUAD

<sup>6</sup> Conservatively estimated value of pro bono services for CUAD [\$644,831]+ donation of rubbish collection services by local councils nationally.

This highlights that the cost to run Clean Up Australia Day alone over the 22 year study period adopted by the Decision RIS represents a community investment of some \$774,761,614 at an average \$2,563.63 per tonne recovered.

Given that CUAD as a large scale community volunteer event is generally regarded as one of the most cost effective litter reduction activities in the world an appropriate value for litter abatement of the scale described in the 2014 Packaging Impacts Decision RIS are more accurately valued at some \$2.107 billion not the \$38 million attributed.

Another plastics related example of flawed government policy assessment playing a primary role in limiting effective action is the Australian Packaging Covenant which has been in place (instead of alternative action) for some 15 years. The Covenant has been renewed twice now – on the base of achieving publicly agreed targets. At every review, government has been repeatedly warned that the Covenant has been badly underestimating the consumption of packaging (by not including the packaging on imported finished goods) only to be rebuffed in the strongest terms. Yet last year, an independent review of the APC found that “Recent independent advice indicates that the existing recycling methodology underestimates the imports of plastics ... estimates indicate the potential impact to be a consumption figure underestimation of 50% in 2013-14). This ‘error’ in real terms represents a 263,500 tonne error in reporting – reducing the plastics recycling rate from around 44% down to 29%<sup>7</sup> and in all likelihood played a significant role in re-adopting the Covenant and stopping action on plastic bags bottles and other packaging at both the state and federal level for over 15 years. Similar misreporting has been noted in tyre recycling and plastic bags in recent years.

These sorts of gross understatement of benefits and exaggeration of costs have become an all too common feature of government policy development. If the problem is consistently understated by our environmental regulators there is little hope for a solution.

### **Solutions:**

The last detailed analysis of the material recovered on Clean Up Australia Day strongly indicates the priority for action which in turn is reflected by the advocacy of our peer, The Boomerang Alliance and its 31 allies – which calls for 3 key steps:

- Eliminate over 80% of all beverage container rubbish (which represent 30.2% of all plastic rubbish) by adopting a national Container Deposit Scheme;
- Ban Single Use lightweight Shopping Bags (14.4% of all plastic rubbish);
- Eliminate primary microplastics (plastic pieces represent around 20%) by:
  - o banning the use of microbeads in laundry, cosmetics and personal care products: &
  - o Enforcing existing regulations where plastics producers and transporters allow nurdles (plastic resin pellets) to escape their control.

#### **Step 1 – Container Refunds**

Any effort to restrict plastic marine pollution is doomed to failure without strong and decisive steps to address bottles and cans. CSIRO Marine Scientist Dr Brita Denise Hardesty summarises the rationale for this simply:

---

<sup>7</sup> See: <http://www.smh.com.au/environment/australian-packaging-industry-falling-short-of-recycling-goal-may-cut-target-20150702-gi39h0>

***“The waste associated with the beverage industry comprises a third and in some estimates a half of the marine debris we find globally”.***

The tried and proven approach used most effectively across the globe is a container deposit system (CDS). A CDS targets the largest single source of marine pollution, conservatively tripling the recycling rates for all bottles and cans (expected recycling rates would be around 85%), but also introduces a number of benefits that will assist in targeting other rubbish. These include:

1. Attracts private capital to establish many thousands of convenient collection points across the country. Much of this infrastructure will also be used to recover other problem wastes
2. Provides the financial incentives and injects the funding needed into clean-up efforts;  
&
3. Educates people about how to recycle and develops the habit of returning material rather than simply throwing it away.

Kerbside recycling became widely established across Australia in the 1980s, when the major newspaper and magazine publishers came together to form the Publishers National Environment Bureau (PNEB) and announced a scheme to financially underpin the viability of paper recovery via kerbside recycling (paper and cardboard are the dominant material recovered vis kerbside). This provided a level of certainty for local government and privately owned recyclers to invest billions of dollars in recycling facilities, trucks and sorting operations.

CDS plays a similar role in tackling the most problematic aspect of the waste stream – providing both the collection infrastructure and interface with consumers to address away from home consumption i.e. hospitality outlets, public venues and recreational consumption – where recycling rates are very low (often less than 10%).

Discussions with coordinating bodies trying to address a range of problem waste have highlighted that one of the major barriers to good resource recovery is operating enough collection facilities to recover material at the end of its life. Existing, but struggling, product stewardship programs for TVs, computers, used paint, light globes, batteries and used chemical containers are just a few industry sectors which have expressed a strong interest in utilizing CDS collection infrastructure to increase their programs recovery rates.

Further, by placing a ‘bounty’ in the most commonly littered item – bottles and cans, Australians will start to value these items and become more educated about the problems of waste and recycling. Once the habit of visiting a CDS collection point is established, it becomes simple to expand the range of materials in an organized, systematic and cost effective manner.

CDS’ have been adopted in over 40 jurisdictions around the world and 5 Australian jurisdictions (SA, NT have schemes and now NSW, ACT and Qld are finalizing investigations to implement CDS), Yet a series of investigations about beverage containers and packaging continue to reach poorly understood conclusions. Put simply a container deposit system does not represent a big cost – drink container waste and litter is a big problem! Based on estimates described in the Commonwealth Government Regulatory Impact Statement, released in 2014, the net economic cost of adopting a CDS would be \$3.57 billion over a 25-

year period – which sounds expensive but represents just 1¢ per container sold on a product that is sold for between \$2.00-\$4.00.

The second argument used to deter government is the notion that a CDS will somehow hurt kerbside recycling – untrue. In an effort to understand the true impact of a CDS on kerbside recycling, NSW Local Government commissioned leading waste experts Mike Ritchie and Associates in 2012. The report concludes that “By adopting a CDS, Councils across Australia could save between \$69-183 million p.a.”<sup>8</sup>

As further evidence of the cost effectiveness of CDS schemes, a 2010 investigation by PricewaterhouseCoopers (PWC) undertook a comprehensive study into the most effective ways to recover used beverage containers. The study looked at systems across Europe, North America, Japan and Australia – using a multi-criteria analysis including economic, social and ecological outcomes, PWC compared how well different methods of beverage container collection worked<sup>9</sup>. The results put paid to the debate regarding container deposit systems and provides proof that the beverage industries scare tactics had little basis in fact.

A summary of PWC’s conclusions are outlined in the table below:

PWC Indicator:  = Strongly Positive Impact  = Positive Impact  = No Impact  = Negative Impact

Impact Area	CDS (Single Use)	Kerbside
Beverage Recovery Rates	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Littering Reductions	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Resource Consumption	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Waste to Landfill	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Opportunities for Container Re-Use	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Overall System Costs	<input type="checkbox"/>	<input type="checkbox"/>
Revenues earned by scheme (to offset scheme costs)	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/>
Stability of Collection System	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Cost of schemes on Government	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Impact on Beverage Pricing	<input type="checkbox"/>	<input type="checkbox"/>

<sup>8</sup> See: <http://www.lgnsw.org.au/files/imce-uploads/90/LGSA%20CDS%20Impact%20Study%20100812a.pdf>

<sup>9</sup> See:

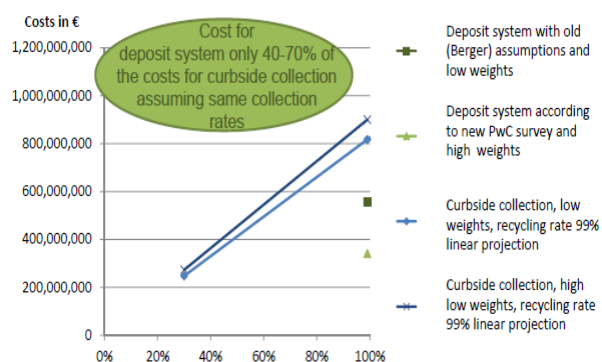
[http://www.duh.de/fileadmin/user\\_upload/download/Projektinformation/Kreislaufwirtschaft/PwC-Study\\_reading\\_version.pdf](http://www.duh.de/fileadmin/user_upload/download/Projektinformation/Kreislaufwirtschaft/PwC-Study_reading_version.pdf)



Key Findings of the PWC Report include:

- 🗑️ Deposit Systems are more sustainable than kerbside collection of beverage containers
- 🗑️ Deposit Systems for beverage containers enable higher collection rates and better recycling
- 🗑️ One way deposit systems are not necessarily more expensive than kerbside collection
- 🗑️ Deposit Systems are more cost effective than kerbside collection
- 🗑️ Deposit Systems and kerbside collection can co-exist very well.

“If the return and recycling rates of the systems are included in the assessment, a mandatory deposit system can be viewed as being more cost efficient.”



**Recommended Action on Bottles and Cans:** With 5 of Australia’s 8 jurisdictions moving to a CDS and Western Australia’s policy position continuing to be for the adoption of a National CDS its time for the Commonwealth to show some leadership and take long overdue action.

**Step 2: Banning single use [lightweight] plastic bags & microbeads**

Complementing action on beverage containers comes the need to directly address two sources of plastics that are known to have the most immediate and direct impact on marine conservation: single use plastic bags and microbeads.

**Single use [lightweight] plastic shopping bags:** Plastics are made from non-renewable natural resources such as crude oil, gas and coal. According to the 2002 Nolan ITU Report for Environment Australia on Plastic Shopping Bags - Analysis of Levies and Environmental Impacts; just 8.7 plastic checkout bags contain enough embodied petroleum energy to drive a car 1 kilometre.

Plastic bags have been around for 30 years now. It is estimated world wide that 1 trillion bags are used and discarded every year.

Australians use 3.92 billion lightweight grocery bags a year (and as many as 14 billion plastic bags overall), that's over 10 million new bags being used every day. An estimated 3.76 billion bags or 20,700 tonnes of plastic are disposed of in landfill sites throughout Australia every year.

It is estimated that around 80 million bags enter the Australian litter stream every year. Unless they are collected, they remain in the environment and accumulate at a staggering rate.

Planet Ark has estimated that it costs governments, businesses and community groups over \$4 million per annum to clean up littered plastic shopping bags

Single use plastic bags are often ingested by marine species, particularly sea turtles, who often mistake them for one of their primary sources of food – jellyfish.

Green and hawksbill turtles in Moreton Bay, have been dying due to plastic bag litter. Marine Biologist Dr. Kathy Townsend from Moreton Bay Research Station, The University of QLD, confirms that approximately 40% of the turtles she autopsies have plastics, including plastic bags, in their intestinal tract.

"The turtles appear to mistake floating plastic bags for jelly fish." says Dr. Townsend.

Many turtles, that have been killed by consuming debris, had plastic bags or fishing line in their stomachs, some as small as half of a fingernail. Sea turtles are especially susceptible to the effects of consuming marine debris due to their bodies' own structure. They have downward facing spines in their throats which prevent the possibility of regurgitation. The plastics get trapped in their stomach, which prevents them from properly swallowing food. Also, many sea turtle rehabilitation facilities commonly deal with "bubble butts," turtles that float as a result of trapped gas caused by harmful decomposition of marine debris inside a turtle's body. The gases cause the turtle to float, which leads to starvation or makes them an easy target for predators.

Like Container Deposits, momentum for a plastic bag ban is growing; polling conducted for NGO 'Do Something' in May 2009 found that 83% of Australians want a ban on non-biodegradable plastic bags. South Australia, The Northern Territory Tasmania and the ACT have taken banned single use lightweight plastic bags plastic bags.

Clean Up is currently supporting bag banning petitions in NSW, Queensland and Victoria. Each of these petitions has been instigated by members of the community.

**Microbeads** are small polyethylene beads less than 1mm in diameter that are widely used in cosmetics, skin care and personal care industries usually used as exfoliating agents. Recent advances in understanding that these microbeads act as sponge absorbing toxics, other contaminants, and the extent that marine species are mistakenly targeting microplastics as a food source has seen the use of this frivolous product become a substantial environmental concern.

Like plastic bags, microbeads are often confused with zooplankton as a source of food. A recent study by the ARC Centre of Excellence for Coral Reef Studies, corals digest microbeads at about the same rate as normal food. As proven by the large amounts of plastic found in their guts, corals are unable to expel of these fragments. Eventually, corals will starve and die if their stomachs become filled with plastics.

Recent research at Plymouth University has shown almost 100,000 tiny 'microbeads' (each a fraction of a millimetre in diameter) could be released in every single application of certain products, such as facial scrubs.<sup>10</sup>

Researchers for the Plymouth University study chose brands of facial scrubs which listed plastics among their ingredients, and these were subjected to vacuum filtration to obtain the plastic particles. Subsequent analysis using electron microscopy showed that each 150ml of the products could contain between 137,000 and 2.8million microparticles.

---

<sup>10</sup> See: <https://www.plymouth.ac.uk/news/millions-of-plastic-particles-found-in-cosmetic-products>

Professor Richard Thompson, who has been studying the effects of litter in the marine environment for over 20 years, said.

“Using these products leads to unnecessary contamination of the oceans with millions of microplastic particles. There is considerable concern about the accumulation of microplastics in the environment; our previous work has shown microplastics can be ingested by fish and shellfish and there is evidence from laboratory studies of adverse effects on marine organisms.”

**Plastic Bag and Microbeads Recommendation:** The threats that plastic bags and microbeads present to the World Heritage listed Great Barrier Reef, spectacular coastal environments and marine species are substantial. Consequently, the consequences of inaction on bags and microbeads represent a failure of public policy to meet its duties and obligations under the obligations under the EPBC Act which identifies ingestion and entanglement by marine debris as a key threatening process to endangered marine life. The Commonwealth needs to take immediate action to ban both single use lightweight plastic bags and microbeads.