



MCKELL INSTITUTE QUEENSLAND

# Stopping the Spread

**THE ISSUE *of* DEATH BY PLASTIC IN  
COMMONWEALTH MARINE AREAS  
& THE GREAT BARRIER REEF**



NOVEMBER 2018

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## BACKGROUND

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# FOREWORD

Plastic pollution, both land-based and in our oceans, is one of the most significant environmental challenges the world faces. The United Nations Environment Programme (UNEP) has even called it a critical problem, comparable to climate change.<sup>1</sup> While plastic pollution is not the only type of marine litter, it is the most abundant form<sup>2</sup> and poses a worldwide threat to marine environments. Mass production of plastic materials, coupled with inefficient disposal systems and widespread limited environmental awareness, exacerbate the issue.



Marine litter is “any persistent, manufactured or processed solid material discarded, disposed of, or abandoned in, the marine and coastal environment”.<sup>3</sup> It is found across the planet, including in remote regions far from civilisation – such as Antarctica, remote mountain-tops and the deep-sea ocean floor.<sup>4</sup> In marine environments, the litter accumulates in high densities posing detrimental consequences for marine life. Many species either accidentally swallow or become entangled in the litter, resulting in injury and sometimes death. It also has economic consequences, for example by limiting fishery productivity.

There is an urgent need to address marine litter both through the strengthening of existing strategies and through new innovations and technology. As marine litter is rooted in production and consumption patterns and the disposal and

management of waste, it is these areas where interventions are necessary.

The aim of the report is to look at what could be done at the federal level to reduce marine litter in our oceans by examining lessons from international case studies. The strategies are categorised in five themes: prevention (preventing the production of plastic and other litter in the first place), mitigation (minimising the amount of litter entering water sources), removal (removing litter from marine environments), education (educating the public and other key stakeholders) and research (understanding the extent and impact of marine litter). It is however important that the potential negative impacts of any policy recommendations are assessed before adoption.

However, the Constitution prescribes no specific environmental regulatory powers to the Federal Government and those powers that the Federal Government does have through the *Environment Protection and Biodiversity Conservation Act 1999* are limited and weak. As stressed by numerous environmental organisations, including the Boomerang Alliance, Places You Love and Environmental Defenders Offices, there is an urgent need for national leadership both on marine litter and on environmental matters more generally.





# EXECUTIVE SUMMARY

This report explores the problem of marine litter in Australia, providing strategies whose implementation could reduce our “marine” footprint and expand the knowledge base on the types of litter that exist in the seas and oceans surrounding us.

The report has the following sections:

**PART ONE: COST OF MARINE LITTER TO ECOSYSTEMS AND THE ECONOMY**

**PART TWO — HOW MUCH LITTER IS IN AUSTRALIA’S OCEANS?**

**PART THREE — HOW DOES AUSTRALIA REGULATE MARINE LITTER?**

**PART FOUR — WHAT STRATEGIES CAN WE LEARN FROM OTHER COUNTRIES?**

**PART FIVE — THE NEED FOR NATIONAL LEADERSHIP AND HOW TO ACHIEVE IT**

## Key Recommendations

Using examples of strategies from around the world, the report makes the following recommendations under an overall target of reducing marine plastic pollution by 70 per cent by 2020. This goal is supported by the Boomerang Alliance and aligns with Indonesia’s goal of 70 per cent by 2025.

### FEDERAL GOVERNMENT POLICYMAKERS COULD:

**1. Prevent marine litter production in the first place by designing and implementing policy to minimise the input of plastic to the environment through deliberate or accidental means. Specifically, this should be done by:**

- Monitoring existing state-based single use plastic bag policies and if successful, implementing it nationally;
- Legislating a ban on microbeads, to close loopholes in the current voluntary ban;
- Considering policies to regulate the manufacture, transport and disposal of single-use plastics such as packaging and plastic bottles;
- Extending smoking bans to all beaches across the country and to all parts of the beach; and
- Establishing stronger import regulations regarding packaging following the EU model.

**2. Mitigate the amount of litter going into the ocean by:**

- Delivering a nationally consistent cash for containers program;
- Developing more ambitious goals regarding recycling, reusing and reducing waste;
- Developing a government-level collection and recycling strategy for derelict fishing gear; and
- Investigating industry expansion development to deal with trade and recycling.

**3. Remove litter from the ocean by:**

- Supporting initiatives to remove fishing gear, particularly very harmful gear; and
- Adopting a source-based approach to tackling polluted water bodies.

**4. Educate the public about the impacts of marine litter to encourage behavioural change by:**

- Informing communities about effective policies and behaviour to significantly reduce single-use plastic litter; and
- Implementing education and associated evaluation campaigns to change behaviour in many sectors.

**5. Research the extent and impact of marine litter by:**

- Considering ways to combine technology and citizen communities in tackling marine litter;
- Supporting research and monitoring to understand and minimise the impact of plastic pollution on sensitive habitats and threatened species; and
- Supporting R&D on alternative materials through cost benefit analyses.

Achieving these recommendations requires greater national leadership. Therefore we provide the following options:

- The appointment of an independent National Waste and Resource Recovery Commissioner; and/ or
- The establishment of an independent, national Environmental Protection Agency; and/ or
- The development of a ratchet mechanism for states and territories; and/ or
- The strengthening and broadening of the EPBC Act to include other areas as Matters of National Environmental Significance.







## PART 1: IMPACT OF PLASTIC POLLUTION

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The most deadly form of marine litter is plastic pollution.

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Due to its lightweight, versatile and durable properties, global demand for plastic has risen exponentially over the past six decades, resulting in plastic production increasing from just under 2 million tonnes per year in 1954<sup>5</sup> to over 320 million tonnes of plastic today.<sup>6</sup>

While plastic is only a small proportion of the waste stream (about 3.9 percent),<sup>7</sup> it makes up the majority of the waste found on our beaches (around 75 percent).<sup>8</sup> Studies estimate that up to 13 million tonnes of that plastic ends up in our ocean each year.<sup>9</sup> That's nearly 1 million extra garbage trucks worth of plastic swimming around in our oceans. Over time these items fragment, resulting in microplastic particles that are orders of magnitude more abundant than the original plastic items.<sup>10</sup> Each year, more and more marine species and ecosystems are disturbed by plastic pollution. If current production and consumption trends continue, the oceans will contain more plastic than fish (by mass) by 2050.<sup>11</sup>

Plastic pollution is ubiquitous in marine environments and is found in all oceanic zones,<sup>12</sup> on remote mountain-tops,<sup>13</sup> in deep sea habitats<sup>14</sup> and beneath Arctic ice sheets.<sup>15</sup> The surface waters surrounding Australia and nearby Pacific islands are greatly contaminated with plastic, especially microplastics.<sup>16</sup>

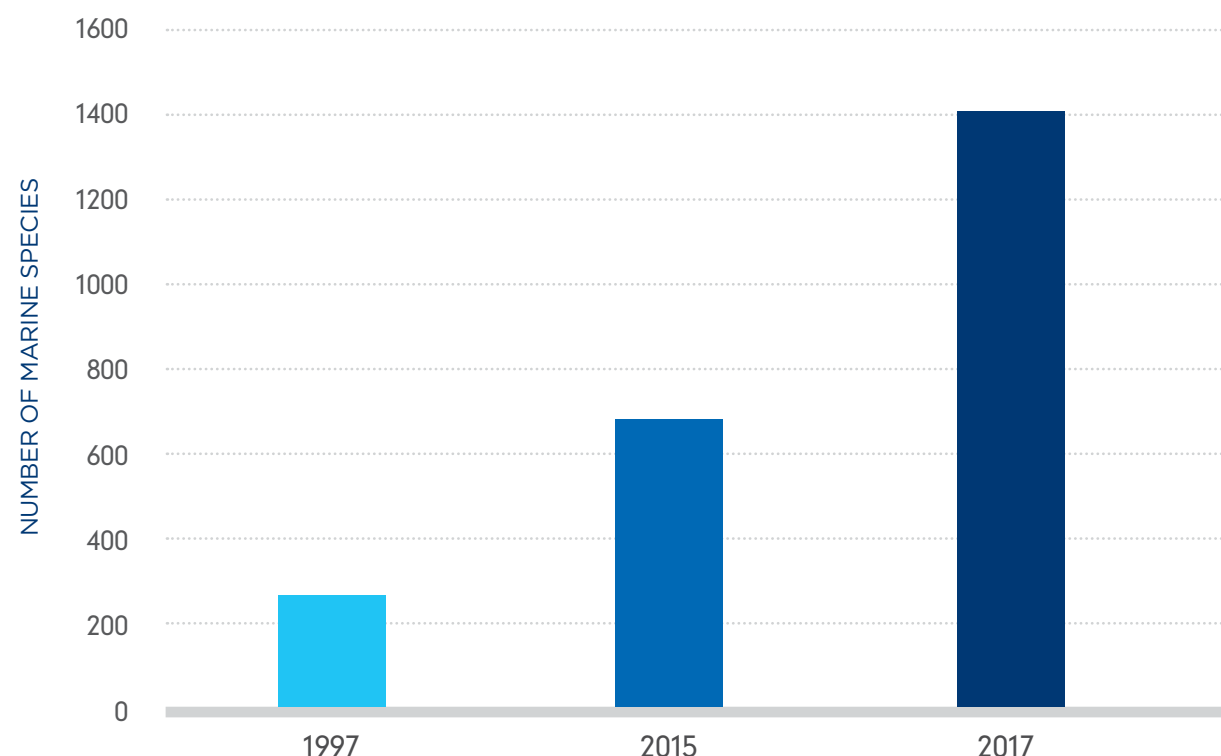
Of growing concern is that once in the ocean a biofilm forms around the plastic and this can become a sponge for a range of toxic chemicals in concentrations far in excess of the surrounding waters.



## Plastic impacts our ecosystems, health and economy

Plastics form an important part of the global economy. As they are light, malleable, strong, inexpensive and can guard against contamination, plastics have a large number of applications. Even disposable plastics deliver many economic benefits (including being cheap to produce) and reduce negative environmental impacts such as food waste (by extending shelf life) and fuel consumption for transportation (by reducing packaging weight). However, despite providing many benefits, the current plastics economy also has various drawbacks that are becoming increasingly apparent and significant.

**FIGURE 1.1**  
THE NUMBER OF MARINE SPECIES REPORTED AS EITHER INGESTING OR BECOMING ENTANGLED IN MARINE LITTER HAS EXPLODED IN RECENT YEARS



Source: Laist 1997,<sup>17</sup> Gall and Thompson 2015,<sup>18</sup> Tekman et al. 2017<sup>19</sup>

Note: While marine life have been increasingly exposed to marine litter, the increase over the last decade is partially due to much higher levels of survey and investigation.

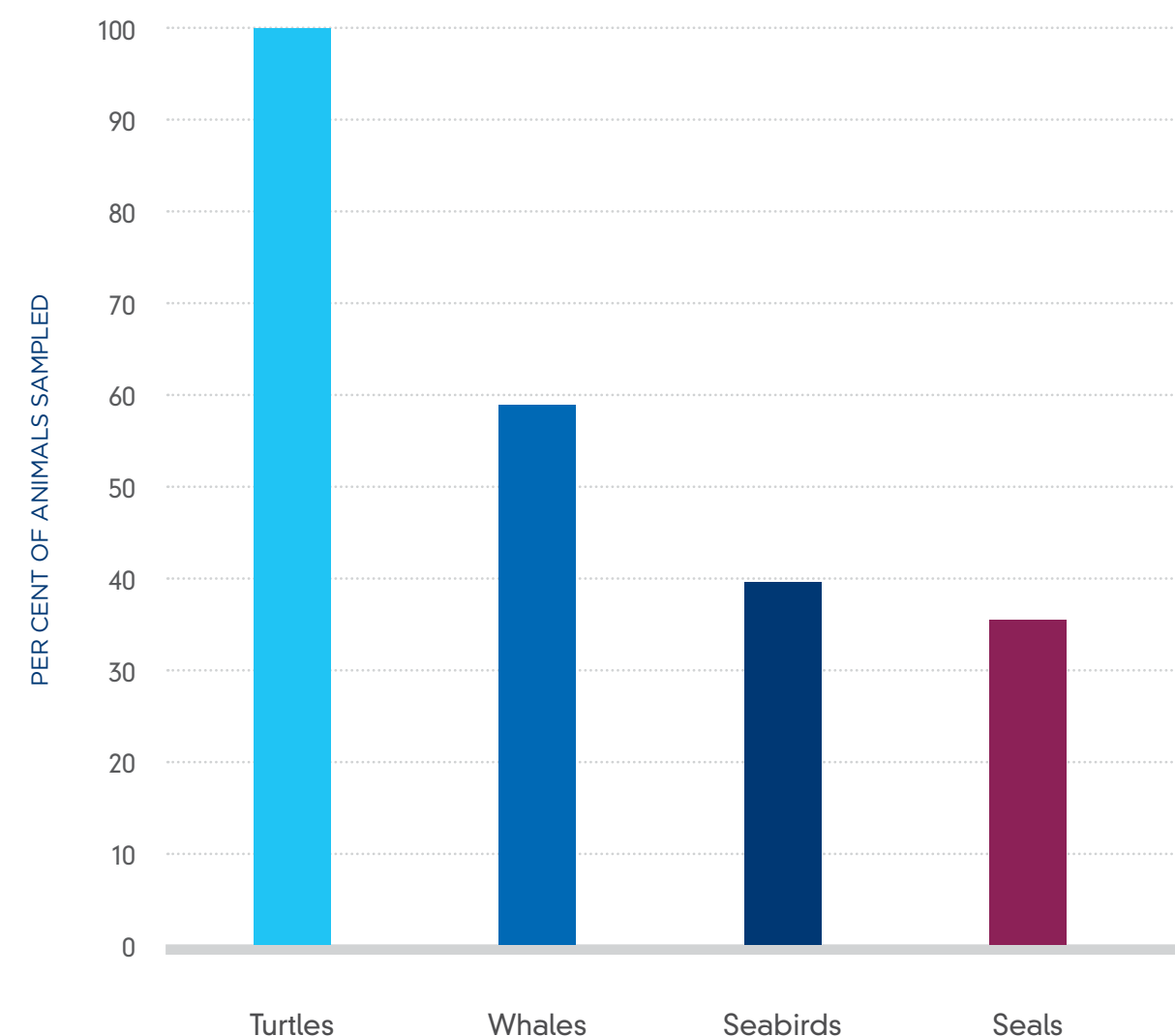
## Costs to ecosystems

The two threats posed by plastic to marine ecosystems that are most often discussed are entanglement and ingestion. Entanglement is where marine life becomes tangled up in litter including lost fishing nets, plastic twine, nylon fishing line, plastic packaging and discarded anchor lines. Alternatively, ingestion often occurs when marine life mistakes plastic pollution for food. Unable to degrade, it accumulates in the animal's stomach.

As microplastic is often the same size as sand grains and planktonic organisms, it is ingested by invertebrates at the bottom of the food chain.<sup>20</sup> Plastic does not easily degrade during digestion, enabling it to be transferred from prey to predator and it may reach higher levels of the food chain. Once ingested, plastic can result in false feelings of satiety, weakness, irritation

of the stomach lining, ulcers, internal bleeding, digestive track blockages, a failure to sustain fat stores and possible death.<sup>21</sup> Simultaneously, entanglement can foster lacerations, strangulation and drowning and can decrease foraging, movement and reproduction,<sup>22</sup> resulting in reduced fitness and potential death.<sup>23</sup>

**FIGURE 1.2**  
A WIDE VARIETY OF MARINE SPECIES HAVE INGESTED PLASTIC

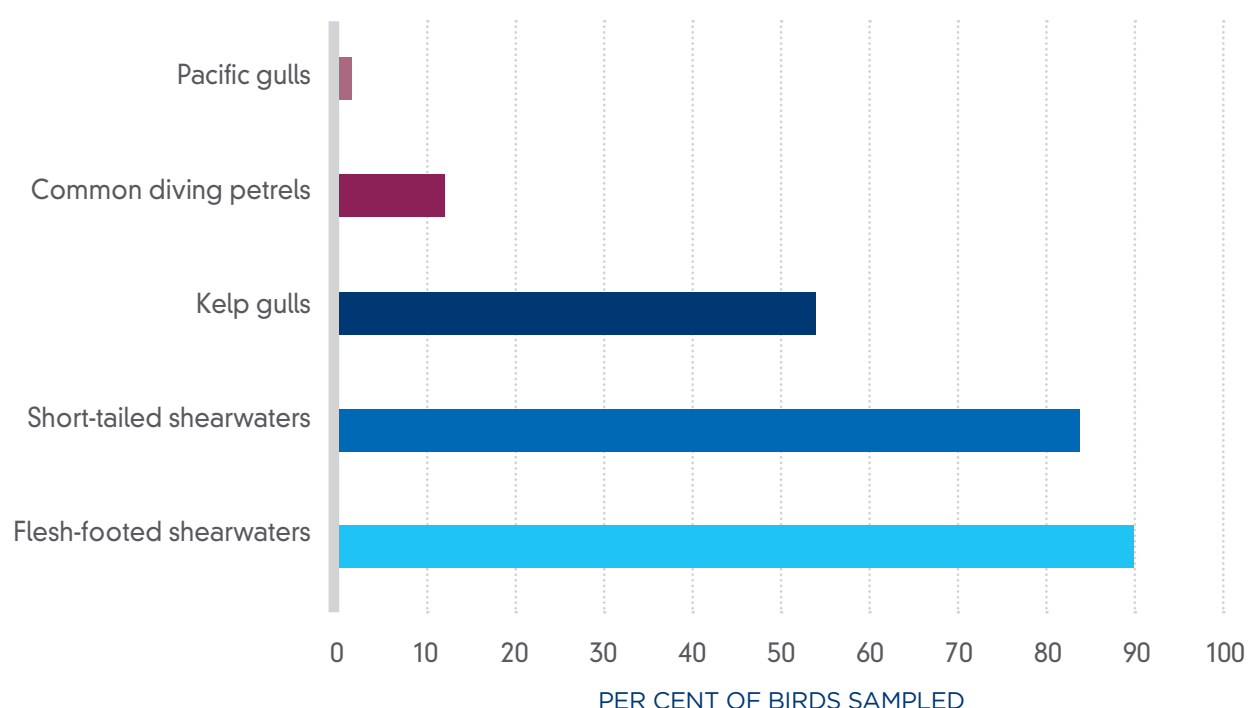


Source: Kühn, Rebolledo and van Franeker 2015<sup>24</sup>



By 2050, ingestion of plastic is expected to impact 99 percent of all seabird species.<sup>25</sup> Marine mammals, such as seabirds and turtles, are arguably mistaking plastic for prey items.<sup>26</sup> Particularly while on the wing, it may be difficult to distinguish between prey and plastic, especially if it is similar in size, shape or colour.

**FIGURE 1.3** MANY AUSTRALIAN SEABIRD SPECIES HAVE INGESTED LITTER



Source: Roman et al. 2016<sup>27</sup>

Note: The figure for short-tailed shearwaters is an average of the range quoted in the study.

Along Australia's northern coast, derelict fishing gear has entangled invertebrates, fish, sharks, turtles, crocodiles and dugongs.<sup>28</sup> Between 1997 and 2012, 138 items were removed from Australian fur seals in southern Victoria, with younger seals being more likely to become entangled than adults.<sup>29</sup> Sadly, one of the most common reasons for turtles dying in northern Australia is because they become entangled in discarded plastic nets.<sup>30</sup>

### Costs to human health

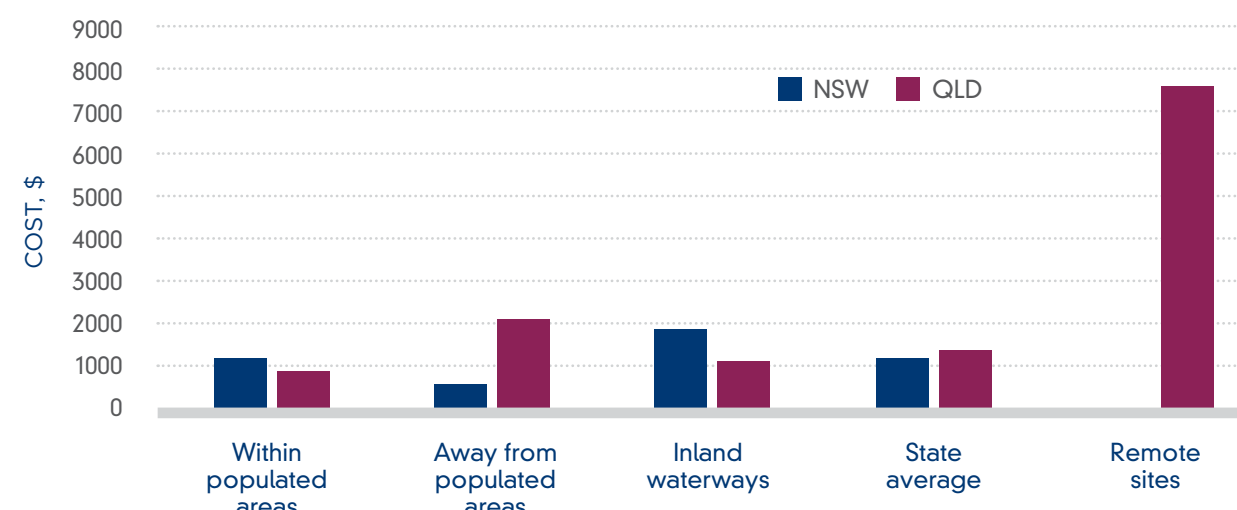
Like other predators, when humans eat fish that contains plastic, there can be health implications. While the effect of eating fish that contain plastic is still unknown, exposure to some types of plastic has been linked with

increased likelihood of cancers, birth defects, immune system suppression and developmental problems in children.<sup>31</sup>

### Costs to the economy

In addition to the range of impacts to health and ecosystems, there are also economic costs. There is substantial economic cost in physically cleaning-up beaches and waterways and removing litter. The Tangaroa Blue Foundation estimated the real average cost of its beach clean-ups in New South Wales and Queensland. The findings show that even the most fundamental action to address marine litter has a high cost.

**FIGURE 1.4** ESTIMATED AVERAGE COST OF BEACH CLEAN-UPS PER KILOMETRE



Source: Tangaroa Blue Foundation and Department of the Environment and Energy 2018<sup>32</sup>

There is also a reduction in output and revenue in many sectors.<sup>33</sup> Litter makes natural areas less attractive, which can impede recreation and tourism. On the Great Barrier Reef, a study found that no visible rubbish is considered more important to quality of life than the jobs and incomes associated with the industry and is one of the most important drawcards for visitors. Both residents and visitors reacted more negatively to the prospect of twice as much visible rubbish than to the idea of a 20 per cent increase in local prices compared to the rest of Australia.<sup>34</sup>

Alongside tourist services, fisheries also experience lost revenue and output as marine litter harms the ecosystems that support fish species. A study in 2011 found that the cost of marine litter related damage to the fishing, shipping and tourism industries across the Asia-Pacific Economic Cooperation region is approximately \$1.35 billion annually.<sup>35</sup>

### CASE STUDY

## CASE STUDY: THE GREAT BARRIER REEF IS A VICTIM OF OUR PLASTIC OBSESSION

Plastic is increasingly finding its way into coral reef ecosystems around the world. As popular sites for visits by tourists, trawlers and recreational vessels, plastic items are often left behind in reefs.<sup>36</sup> Plastic in the form of ropes, rigging lines, fishing floats and marker buoys – discarded by the fishing industry – is also often found.<sup>37</sup> Discarded fishing equipment is particularly damaging because it is designed to kill fish. This plastic waste may host pathogens that trigger disease outbreaks on coral reefs<sup>38</sup> and cause physical injury and abrasion to coral tissues. The loss of marine habitat also drastically reduces fishery productivity near coral reefs.<sup>39</sup>

A study led by the ARC Centre of Excellence for Coral Reef Studies at James Cook University in Queensland,<sup>40</sup> found that the likelihood of disease when corals in contact with plastic increases from 4 percent to 89 percent. Structurally complex corals are eight times more likely to be harmed by plastics, leading to consequences for fisheries and the habitats of reef organisms. Currently, more than 11 billion plastic items are entangled on coral reefs around the Asia-Pacific with this number expected to increase to nearly 16 billion by 2025. In the Great Barrier Reef, roughly one-third of surveys of the subtidal area (the area that is below low tide and always covered by water) contained some type of litter.<sup>41</sup> Another study of water samples from near the central Great Barrier Reef found microplastics in all sampling locations.<sup>42</sup>



## PART 2: PLASTIC IS THE MOST COMMON TYPE OF LITTER ON AUSTRALIA'S BEACHES

Due to the expense of collecting data on debris in our oceans, Australian databases are based largely on beach clean-ups. However, research has found that coastal surveys provide similar data regarding the abundance of marine debris as compared to data collected at sea by aircraft and vessels.<sup>43</sup> As a result, data from coastal surveys provide an indication of the types of marine debris likely to be found in our oceans.

### Tangaroa Blue Foundation

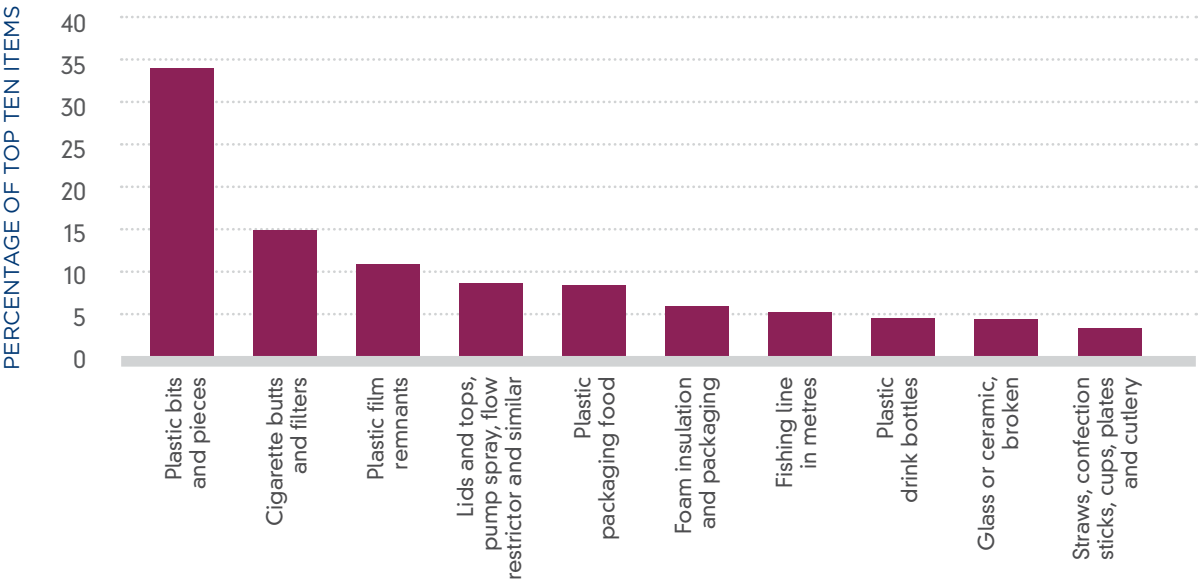
In Australia, the main marine debris database is coordinated by the Tangaroa Blue Foundation, who oversee the Australia Marine Debris Initiative: a community of groups who monitor the impacts of marine debris along Australia's coastlines. These groups conduct regular beach clean-ups and input data into the Australian Marine Debris Database, which provides information on the types of marine debris affecting different sections of coastline.<sup>44</sup> While a survey of experts suggests that plastics that stay in one piece, such as fishing line and plastic packaging pose the greatest risk for entanglement,<sup>45</sup> a wide range of items are believed to pose ingestion risk, including plastic fragments (micro-plastics), plastic bags and utensils such as plastic forks.







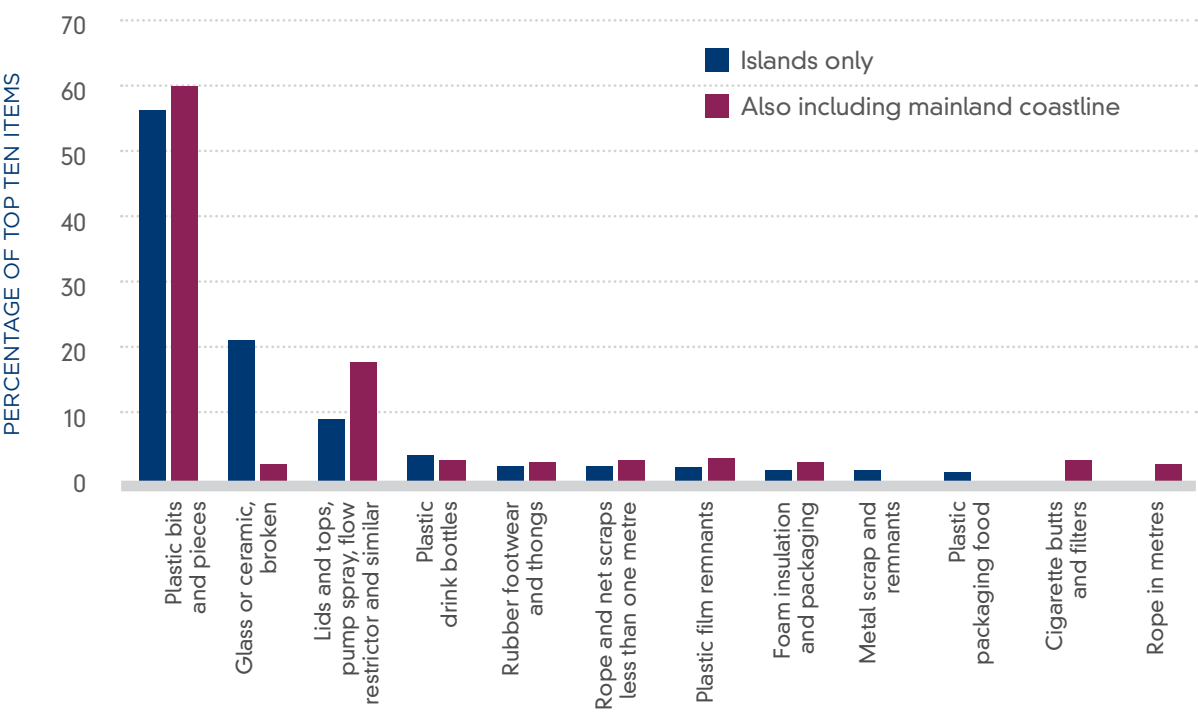
FIGURE 2.1 TOP TEN ITEMS, AUSTRALIA-WIDE



Source: Tangaroa Blue Foundation 2018,<sup>46</sup> based on 1/01/2017 – 31/12/2017 period

The Australian Marine Debris Database enables us to focus on different sections of Australian coastlines. Two searches identified the concentration of marine debris in the Great Barrier Reef. The first concentrated only on clean-ups on the islands located on the Reef while the second also included the relevant section of Queensland’s mainland. In both searches, plastic-based marine debris constituted the clear majority of items, exemplifying the danger faced by the Great Barrier Reef from plastic pollution.

FIGURE 2.2 TOP TEN ITEMS, GREAT BARRIER REEF



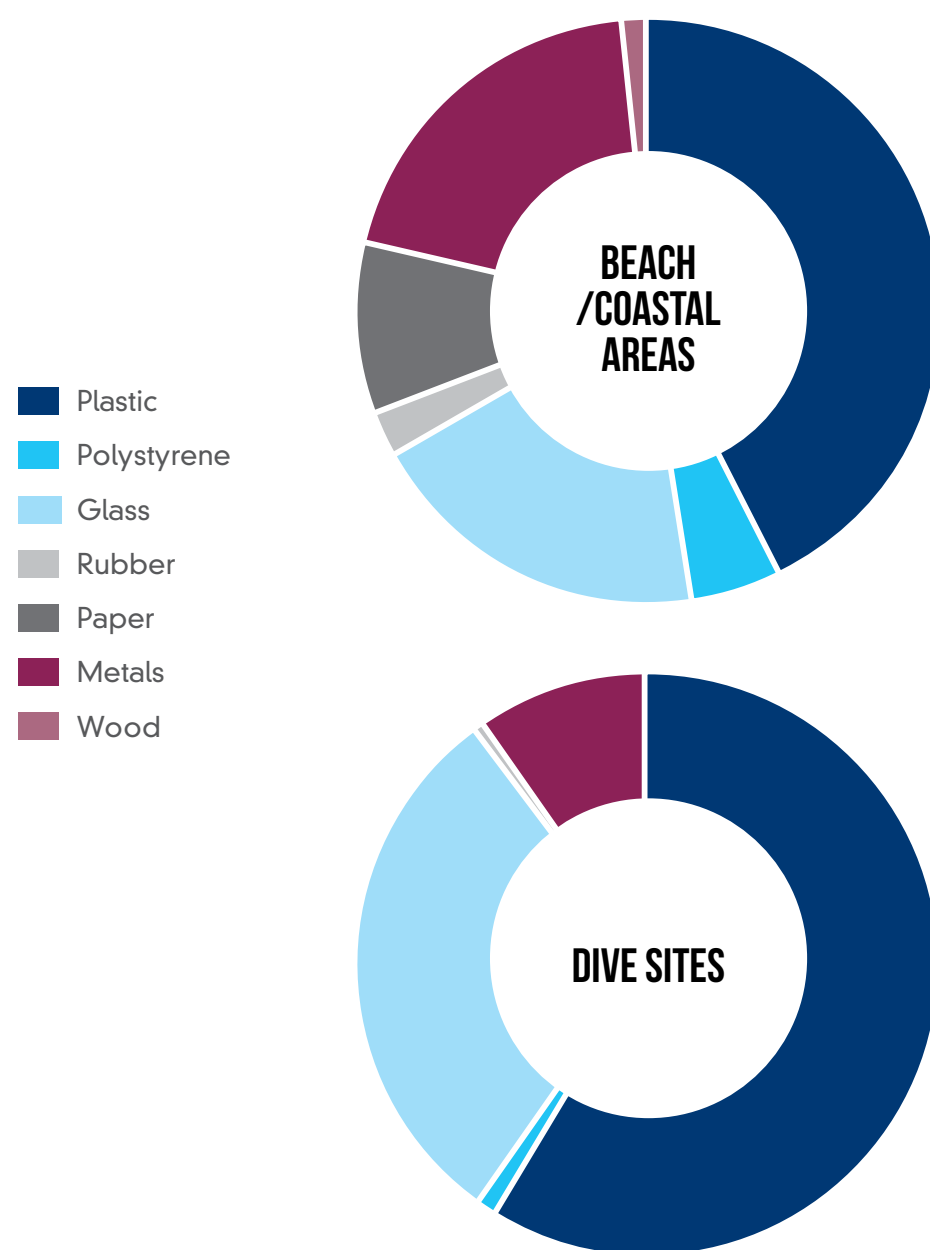
Source: Tangaroa Blue Foundation 2018,<sup>47</sup> based on 1/01/2017 – 31/12/2017 period



## Clean Up Australia

Data from the Clean Up Australia Day Rubbish Report provides a snapshot of the different kinds of litter collected during the annual event. For both beach/ coastal areas and dive sites, plastic was the most common item identified.

**FIGURE 2.3** TYPES OF RUBBISH REMOVED ON CLEAN UP AUSTRALIA DAY, BY SITE



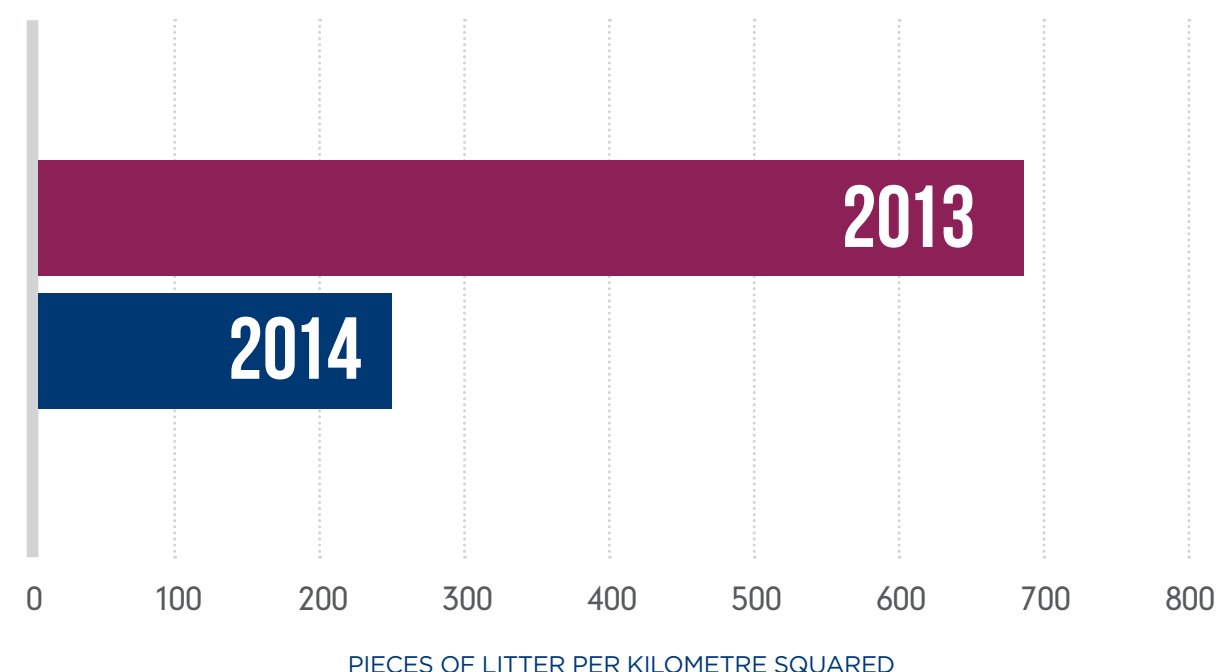
Source: Clean Up Australia Day Rubbish Report 2017<sup>48</sup>

Note: The category miscellaneous (unidentified) was excluded from the figure to more clearly identify the other categories.

## Types of rubbish found at sea

Some recent studies have identified the types of items that pollute Australia's oceans. In 2013 and 2014, Rudduck et al. collected surface net tows (where nets are used to collect samples from the sea surface or within a few metres of the sea floor) between Hobart, Tasmania and Sydney.<sup>49</sup> In both harbour and offshore areas, most of the plastic found was microplastics (defined in this study as less than 4.75 centimetres). However, more synthetic materials and a greater diversity of polymer types (such as nylon and cellulose acetate from cigarette filters) were found in harbour samples.

**FIGURE 2.4** THE ABUNDANCE OF MARINE LITTER IN OUR OFFSHORE WATERS DIFFERS BETWEEN YEARS



Source: Rudduck et al. 2017<sup>50</sup>

One of the most dangerous types of litter that finds its way into oceans around the world is derelict fishing gear (abandoned, lost and discarded nets, lines and traps). The Conservation group World Animal Protection estimates that around 640,000 tonnes of so-called "ghost gear" is left in oceans each year, where it remains for up to 600 years, trapping, injuring and killing marine life.<sup>51</sup> An analysis of waters around Australia found that the vast majority of microplastic fragments come from plastic packaging including cups, bottles and bags, and fragments of fishing gear.

Each year, between 5,000 and 15,000 sea turtles become entangled in northern Australia alone.<sup>52</sup>

### IN SUMMARY:

- Plastic is the most common form of litter on Australia's beaches.
- It is also one of the most common in our oceans.
- The items most likely to be found in our oceans are plastic bits and pieces rather than whole, easily distinguishable, products.





## PART 3:

# THE FEDERAL GOVERNMENT'S REGULATORY RESPONSE

The closest Australia has come to legislating action to address marine litter is through the development of a 'Threat Abatement Plan for the Impacts of Marine Debris on Vertebrate Marine Life', which was introduced under the *Environment Protection and Biodiversity Conservation Act 1999*.

However, this plan was reviewed in 2015 and found to be largely ineffective,<sup>53</sup> resulting in the recently released 'Threat Abatement Plan for the impacts of marine debris on the vertebrate wildlife of Australia's coasts and oceans (2018)'. This plan does not automatically mean that steps will be taken to address each of its policy recommendations. Rather, the recommendations serve as guidance and their implementation is up to the discretion of the Minister for the Environment who is hindered by a difficult balance between Commonwealth, state/ territory and local government powers.

### Environment Protection and Biodiversity Conservation Act – 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) explicitly targets a number of areas of national environmental significance (MNES) including: nationally threatened species and ecological communities, Commonwealth marine areas and the Great Barrier Reef Marine Park.<sup>54</sup> Additionally, some recovery plans – which are binding on the Australian Government – are also relevant, including the Australian Government's Marine Turtle Recovery Plan and the Conservation Management Plans for the Blue Whale and for the Southern Right Whale.

Under the EPBC Act, a threatening process (one that does or could threaten the survival or abundance of a native species or ecological community) can be treated as key if:

- It could cause a native species or an ecological community to become eligible for listing in any category (i.e. extinct, extinct in the wild, critically endangered, endangered, vulnerable); or
- It could cause a listed threatened species or ecological community to be listed in a category representing a higher degree of endangerment; or
- It detrimentally affects two or more listed threatened species other than conservation dependent species.<sup>55</sup>



### Threat Abatement Plan for the impacts of marine debris on vertebrate marine life – 2009

Once a threatening process is acknowledged under the EPBC Act, a threat abatement plan can be developed if the Minister for the Environment decides it is “a feasible, effective and efficient way” to address the threatening process.<sup>56</sup> Threat abatement plans outline the research, management and other necessary steps to decrease the impact of the key threatening process on native species and ecological communities. They are designed by the Department of the Environment who consult with relevant stakeholders including state and territory governments, industry experts and academia.<sup>57</sup>

In 2003, the key threatening process *Injury and fatality to vertebrate marine life caused by ingestion of, or entanglement in, harmful marine litter* was acknowledged under the EPBC Act. Among other factors, the listing was in response to the adverse effects of marine litter, the threatening process, on at least twenty listed threatened species.<sup>58</sup> In May 2009, the listing resulted in the ‘Threat Abatement Plan for the impacts of marine litter on vertebrate marine life’ (henceforth referred to as the TAP) being developed.<sup>59</sup> The plan is a national strategy to abate the threat caused by marine litter and guides relevant efforts and investments.<sup>60</sup>

Since then, however, there was little progress in reducing the harm posed by litter to marine ecosystems. The 2014 TAP Review found that “despite progress particularly in clean-up efforts, it is not possible to state that these criteria [for abating the key threatening process] have been met during the life of the plan”.<sup>61</sup> There had not been a decline in the amount of harmful marine litter in Australia’s oceans nor had there been a decline in the mortality and injury caused to marine

life due to ingesting and/or becoming entangled in marine litter.<sup>62</sup>

These findings resulted in the recent release of the ‘Threat Abatement Plan for the impacts of marine debris on the vertebrate wildlife of Australia’s coasts and oceans (2018)’. The Threat Abatement Plan describes actions that are needed to abate the problem of marine litter. These actions include developing understanding about microplastic impacts and the possibility of using new technologies to manage waste and increase recovery rates.<sup>63</sup>

### Toxic tide: the threat of marine plastic

Increasingly, governments and those with the power to change Australia’s regulatory response to marine litter are demanding action. In 2016, a Senate inquiry, ‘Toxic tide: the threat of marine plastic’, revealed a unanimous call from Labor, Liberal and Greens senators for governments to address the “alarming rate” at which plastics are entering our oceans. The report recommends a number of actions including an immediate (compulsory) ban on

microbeads, national container deposit schemes, and the listing of marine plastic pollution on the Council of Australian Governments’ agenda for “urgent consideration”.<sup>64</sup>

### Product Stewardship Act

While the production and disposal of waste is generally under the jurisdiction of Australian state laws, the *Product Stewardship Act* provides a mechanism for the federal government to regulate products that are harmful for marine environments. Under the Act, those involved in the production, sale, use and disposal of products have a shared responsibility to reduce the impact of the products and materials on the environment and human health and safety.<sup>65</sup> The Act regulates industries and products in three main ways: (a) voluntary – product stewardship is encouraged without regulation; (b) co-regulatory – these schemes are delivered by industry and regulated by the Government; and (c) mandatory – parties face a legal obligation to take certain steps regarding particular products.<sup>66</sup>

However, the Act requires many, lengthy stages including negotiation and consultation with stakeholders and ministers, a regulatory impact statement, a cost benefit study, the establishment of agreed fees and the involvement of Customs to track imports.





## PART 4: AS A COUNTRY, WE CAN LEARN FROM INTERNATIONAL EXPERIENCE

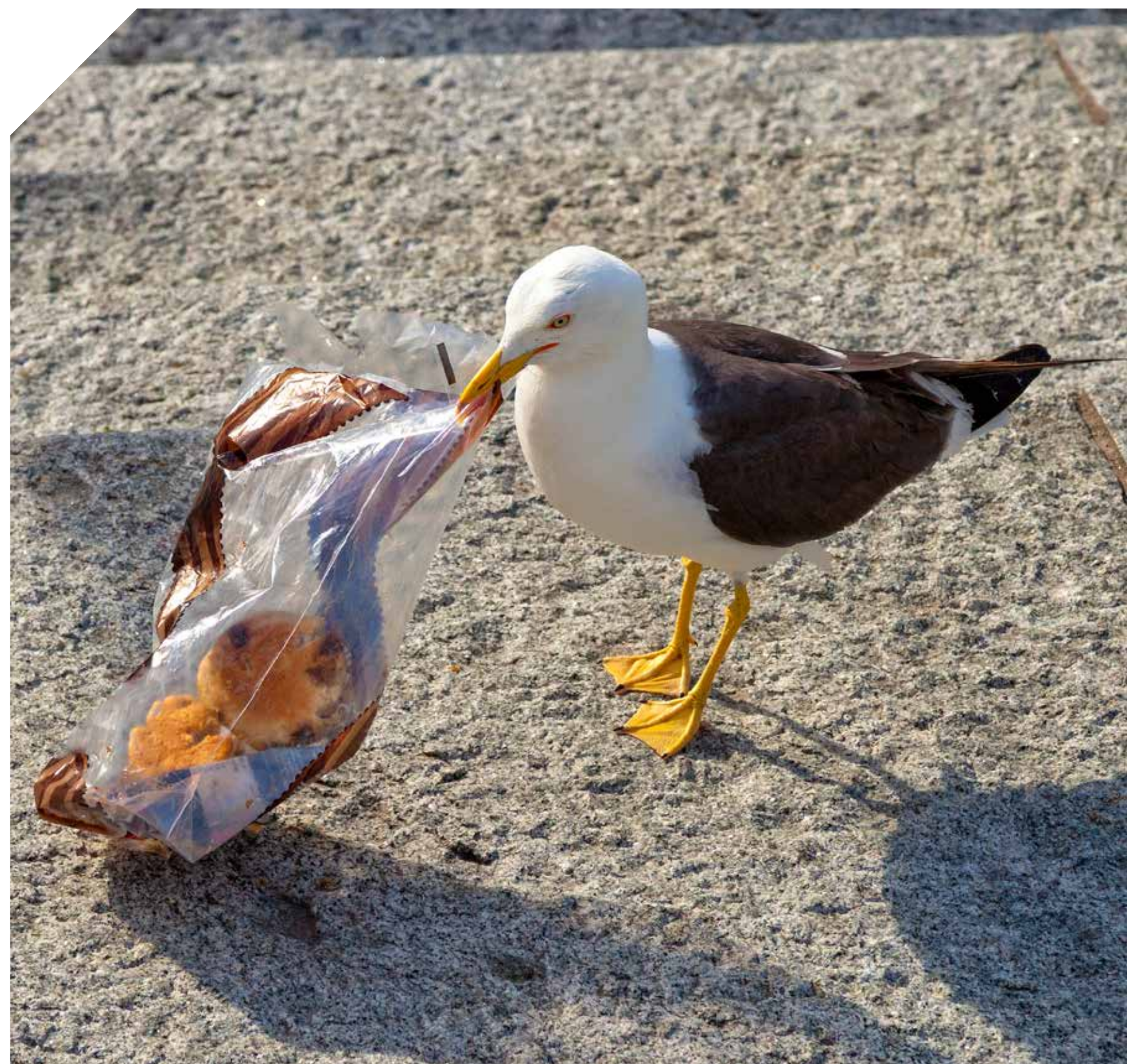
There are five ways in which Australia can take action to reduce marine litter: 1. Prevention (preventing the amount of plastic being produced in the first place); 2. Mitigation (minimising the amount of plastic entering the ocean); 3. Removal (removing litter from marine environments); 4. Education (educating the public and other key stakeholders with the aim of changing behaviour) and 5. Research (understanding the extent and impact of marine litter). We provide examples of initiatives from around the world.

### Prevention: Support the long-term prevention of marine litter

Around the world, many strategies have been implemented to regulate plastic consumption, such as plastic bag policies, and production, such as bans on microbeads. These strategies have been largely successful. For example, the ban on plastic single-use bags in Californian cities in 2014 resulted in statistically significant decreases in disposable bag usage and increases in reusable bag usage across different supermarket chains.<sup>67</sup> Relevant taxes have also led to the number of plastic bags on seabeds close to Norway, Germany, Northern France and Ireland decreasing by 30 percent.<sup>68</sup>

#### 1. Plastic bag policies

In 2002, Bangladesh became the first country to ban plastic bags after they were found to choke drainage systems and contribute to devastating floods.<sup>69</sup> In the same year, Ireland became the first country to charge for plastic bags provided by retail establishments. In Ireland, the generated funds are used for recycling facilities, enforcement of waste management laws and other environmental purposes.<sup>70</sup> Since then, over forty countries have implemented bans, partial bans, fines or taxes on individuals and companies using single-use plastic bags.<sup>71</sup> After several member states had implemented their own plastic bag policies, the European Union is now considering an all-inclusive plastic bag tax.<sup>72</sup> The production of plastic bags is a criminal offence in countries including Mauritania, Somalia, South Africa and Rwanda. In Kenya – the country with arguably the world's most drastic plastic bag ban – violators face up to four years imprisonment or fines of US \$40,000.<sup>73</sup>





## ► IMPLEMENTATION IN AUSTRALIA

Although several states and territories have their own plastic bag ban, there is still no national plastic bag policy in Australia. Recent pressure from consumers has, however, seen both major supermarket chains introduce single-use plastic bag bans. As of 1 July 2018, both Coles and Woolworths have made advances towards no longer offering single-use lightweight plastic bags at checkouts. This year also saw the Queensland and Western Australian state governments introduce plastic bag bans, joining South Australia, Tasmania and the ACT. With increasing consumer pressure as well as the drastic consequences plastic bags pose to the environment, conditions are ripe for a national policy on plastic bags. In designing a nationally consistent plastic bag policy, research should be conducted into the effectiveness of existing policies in individual states and territories.

Single-use plastic bag policies may have unintended consequences. In California, disposable bag policies lead to fewer bags being used per year but an increase in the combined plastic weight from supermarkets.<sup>74</sup> Production of paper bags and reusable bags can also have higher global warming potential than traditional plastic carryout bags, with a cotton bag needing to be used 131 times to make the same global warming contribution as a single-use plastic bag that is used once.<sup>75</sup> Although cloth bags are designed to be used a large number of times, people often forget to bring their reusable bags and buy new ones. Life-cycle assessments have consistently found that plastic carryout bags require significantly less energy and water to produce, less energy to transport and emit fewer greenhouse gases during production.<sup>76</sup> However, plastic bags may be more problematic for less easily quantified issues including marine litter, the toxicity of materials and impacts on wildlife. There is therefore a trade-off that must be struck between greenhouse gas emissions and harmful consequences for marine ecosystems.

## 2. Prohibitions of microbeads in personal care products

Conventional wastewater treatment plans cannot capture plastic microbeads, resulting in their discharge into waterways. They cannot degrade and can transport toxic chemicals into marine ecosystems. In response, countries such as the UK, Canada, the USA and New Zealand have legislated bans on the use of microbeads in personal care products. In the US, the Microbead-Free Waters Act of 2015 required companies to stop manufacturing microbeads in beauty and health products by July 2017 and to ban rinse-off cosmetics with intentionally-added microbeads by July 2018.<sup>77</sup> Both Canada and New Zealand have extended the microbead ban to other non-personal care products. In Canada, the ban extends to natural health products and non-prescription drugs,<sup>78</sup> while, in New Zealand, the ban also covers abrasive cleaning products.<sup>79</sup>

## ► IMPLEMENTATION IN AUSTRALIA

In Australia, a voluntary microbead ban on using microbeads in personal care and cleaning products was achieved by the mid-2018 deadline. However 100 percent coverage of the market has still not been achieved and it contains a loophole that could see such products continue to appear on the market. The government should consider whether a voluntary or legislated ban would be more effective. The ban should also extend to all 'wash off' products, including cleaning products, as well as to both natural health products and non-prescription medications. While microbeads are typically used for exfoliation, there are a range of natural alternatives.

## 3. Prohibitions of nurdles or pre-production plastic

Each year, companies use nurdles (very small plastic pellets about the size of a lentil) by the billions to manufacture nearly every plastic product bought. These nurdles, like microbeads, are tiny and easily blown into water sources during transport and manufacture. Though small individually, as many as 6000 nurdles litter every square metre of our beaches.<sup>80</sup> Nurdles attract

and concentrate pollutants to highly toxic levels, like other plastics do not disappear and can be mistaken for prey by marine animals. In 2007, California passed a law requiring companies that manufacture, handle and transport nurdles to implement programs that, at a minimum, controlled discharges of nurdles from point and nonpoint sources and covered waste discharge, monitoring and reporting requirements.<sup>81</sup>

## ► IMPLEMENTATION IN AUSTRALIA

Thus far, Australia has no concrete national laws to prevent the release of nurdles into the environment. While state pollution laws could apply, they have not been used. Organisations such as the National Toxics Network Inc., are campaigning for effective regulations.<sup>82</sup> In designing and implementing regulations, the Australian government can learn from lived experiences in California.

## 4. Policies regulating other forms of disposable plastics

One of the countries making headlines most recently for banning disposable plastics is India. In January 2018, India's capital city Delhi introduced a ban on all types of disposable plastic, including cutlery, bags and cups.<sup>83</sup> Since 2002, the Indian state of Tamil Nadu has also had a ban on plastic bags as well as a vast range of plastic items distributed by food establishments.<sup>84</sup> The bans in India are, for the most part, due to plastic being burned for fuel and heating, creating terrible air pollution. France has also banned disposable plastic plates and cups. By January 2020, France aims to have all disposable tableware contain at least 50 percent biologically-sourced and compostable materials and hopes to increase this percentage to 60 percent by 2025.<sup>85</sup> Policies also include taxes, including Belgium's 'Packaging Charge' on beverage containers in 1993.<sup>86</sup>

In May 2018, the European Commission proposed new EU-wide rules to target the ten single-use plastic products most often found on Europe's beaches and oceans and lost and abandoned fishing gear. The new rules are tailored to

different products and, where alternatives are readily available and affordable, single-use plastic products will be banned. The new rules will introduce plastic bans in particular products, consumption reduction targets, obligations for producers, collection targets, labelling requirements (to indicate how waste should be disposed of) and awareness-raising measures.<sup>87</sup> The UK Prime Minister Theresa May also recently announced a plan to ban plastic products such as cotton buds, drink stirrers and plastic straws in response to rising fears regarding plastic marine pollution and has urged other Commonwealth leaders to follow.<sup>88</sup>

## ► IMPLEMENTATION IN AUSTRALIA

In Australia, these types of policies could be implemented at a federal level through the Product Stewardship Act. One product that has recently received much media attention is plastic drinking straws with venues across the nation committing to reduce their use.<sup>89</sup> Bans on plastic straws may, however, pose a disadvantage to people with disabilities.<sup>90</sup> However, this should not stop the banning of broadscale use of them by drinking outlets; with limited availability for medical purposes. Any policies regarding straws should involve consultations with affected communities.

## 5. Cigarette bans on beaches

Cigarette butts contain plastic and pose serious environmental consequences for marine life, including ingestion and toxicity. In response, countries around the world have banned smoking on certain beaches. Most recently, Thailand introduced a smoking ban at twenty-four popular tourist beaches. Those caught violating the ban face a large fine and up to one-year imprisonment.<sup>91</sup> Other examples of jurisdictions that have banned smoking on beaches include two beaches in the UK (Caswell Bay in Swansea and Little Haven in Pembrokeshire)<sup>92</sup> as well as around 300 US municipalities.<sup>93</sup>

## ► IMPLEMENTATION IN AUSTRALIA

In Australia, only Queensland, Tasmania, Victoria and Western Australia have implemented







smoking bans of some form on patrolled beaches and/or artificial beaches.<sup>94</sup> However, many of these bans only apply to the area between the flags on patrolled beaches. Extensions of these bans to the whole beach as well as to all beach types are necessary to reduce harm posed to marine life. Regulations targeted at making smoking more difficult are widely accepted in Australia,<sup>95</sup> and a blanket ban on smoking on beaches would not only have positive environmental benefits but also positive health benefits. Alternatively, as has been the case in Magnetic Island on the Great Barrier Reef, cigarette butt receptacles may be placed on jetties and fishing spots so butts are less likely to be discarded into the ocean.

## 6. Stricter packaging standards

The *EU Packaging and Packaging Waste Directive* sets recovery and recycling targets and deadlines for EU Member States. It includes the 'Essential Requirements for Packaging' that seeks to reduce packaging waste by setting design requirements for many packaging materials and packaged goods. Only packaging that meets the requirements is guaranteed free circulation in the European Economic Area.<sup>96</sup> The requirements include: that the packaging volume and weight is limited to the minimum adequate amount that satisfies the necessary safety, hygiene and acceptance (by the consumer) levels; that the packaging is designed to be reused and recovered, including recycled, and its impact on the environment is minimised; and, that a certain percentage by weight of the packaging materials can be recycled and manufactured into marketable products (dependent on the type of packaging).<sup>97</sup>

### ► IMPLEMENTATION IN AUSTRALIA

In comparison, packaging standards in Australia are much less stringent. The Australian Packaging Covenant seeks to reduce environmental impacts from packaging and supports resource use, reuse and recycling innovation to reduce the quantity going to landfill. The APCO advocates for a 'circular economy' (reduce, reuse, recycle) culture in Australian businesses and focuses on

recovering product packaging for further use after its initial use.<sup>98</sup> However, the standards are not legally enforced and the 2018 Threat Abatement Plan does not contain any action points that specifically address packaging. Australian policymakers should analyse how stricter standards regarding the environmental impact of packaging can be implemented in Australia. Such standards could reduce the amount of packaging waste and thus likely also the amount reaching our oceans.

## Mitigation: Improve waste disposal systems to prevent litter entering the sea

Mitigation measures focus on preventing marine litter from entering oceans by improving waste management.

### 1. Cash for containers

One of the most effective container deposit schemes is the German 'Pfand' system. Since May 2006, retailers and other final distributors have been required to accept all single-use containers that are on their retailer's list (the bottle is compared against a list of receptacles sold by the particular vendor). "Pfand" is an additional deposit paid as part of the price of a bottle or can, which gets reimbursed to the customer when the container is returned. Currently, only 1-3 percent of non-reusable bottles are not returned and recycling rates for cans are around 99 percent. However, as reusable (e.g. glass) bottles must be returned to the same retailer they were purchased from, the overall percentage of reusable bottles sold has sunk by around 30 percent.<sup>99</sup>

### ► IMPLEMENTATION IN AUSTRALIA

In comparison to the German system, container refund schemes in Australia have lower participation rates. One reason behind this may be lower financial incentives. In Germany, consumers receive up to 25-euro cents (about 0.40 AUD) for single-use bottles, however, Australian consumers typically only receive 10 cents per container. Particularly coupled with higher relative living costs in Australia, this creates a lower financial incentive for

participation. It is also more difficult and time-consuming to participate in Australian schemes as consumers are unable to return the containers directly to stores, which they can in Germany.<sup>100</sup> The federal government could use the *Product Stewardship Act* to require a clear harmonisation process between states on, for example, deposit rates, containers covered (wine is omitted in existing schemes) and consumer access. An analysis of the German "Pfand" system would be useful in designing this process.

## 2. Towards a circular economy

A circular (reduce, reuse, recycle) economy is an alternative to a traditional linear economy (make, use, dispose) in which we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life.

In March 2017, negotiations on a circular economy to boost EU waste policy were held in Brussels. The main elements of the revised waste proposal are:

- A common EU target to recycle 65 percent of municipal waste by 2030;
- A common EU target to recycle 75 percent of packaging waste by 2030;
- A binding target to decrease landfill to a maximum of 10 percent of municipal waste by 2030;
- A ban on landfilling separately collected waste (i.e. if plastics are separated by households and businesses for recycling, they cannot then be landfilled with general waste);
- The promotion of economic instruments to discourage landfilling, streamline definitions and harmonise calculation of recycling rates throughout the EU;
- The development of measures to promote reuse and boost industrial symbiosis (where one industry's by-product becomes another industry's raw material); and
- Economic incentives targeted at producers to market greener products and support recovery and recycling schemes.<sup>101</sup>

Arguably, the jurisdiction with the most ambitious circular economy scheme is San Francisco, which aims to be zero waste by 2020. As part of achieving this goal, the 'Mandatory Recycling and Composting Ordinance' was passed in 2009. The "Fantastic Three" residential curb side collection program requires San Franciscans to separate commingled recyclables, compostable materials (including food scraps, food-soiled paper and yard trimmings) and any remaining trash. The city council offers various size and rate options for bins to suit household needs. In 2012, San Francisco diverted almost 80 percent of its waste from landfill – the highest rate of any major US city – by focusing on composting and recycling.<sup>102</sup>

### ► IMPLEMENTATION IN AUSTRALIA

In Australia, there has so far been little movement towards a circular (reduce, reuse, recycle) economy. However, the recent introduction by China of the Blue Sky 2018 program, which sets stringent "maximum contamination thresholds" and limits the number of import permits provided to Chinese businesses,<sup>103</sup> could be used as an impetus for action. Faced with restrictions that exclude 99 percent of the recyclables previously sold to China, Australia faces three categories of medium- to long-term options: (i) increase the quality of recycling to enable continued export, (ii) invest in onshore processing facilities and recycling markets and/or (iii) reduce the need for recycling altogether.<sup>104</sup>

In response to dangerously high stockpiles of recyclables across the country, the Waste Management Association of Australia and the Australian Council of Recycling have called upon politicians to implement the Australian Circular Economy and Recycling Action plan.<sup>105</sup> However, making a circular economy work effectively is complicated by plastic coming into Australia from countries with lower packaging standards. High landfill fees also discourage plastic use and encourage recycling because the more waste produced, the more that needs to be paid. While Queensland has just introduced a landfill levy, and NSW has the highest, the fees in other states are currently too low. Thought should also be given to developing viable mechanisms to prevent microfibres from entering waterways; a topic,



which is gaining increasing regulatory and media attention.

### 3. Higher littering fines

In April 2018, the UK introduced new penalties for littering, increasing the price ceiling for on-the-spot fines from 80 pounds (around AUD\$140) up to 150 pounds (around AUD\$263). Provided it is possible to prove rubbish has been thrown from their car or illegally dumped, authorities can also use the penalties to target vehicle owners. In agreement, Environment Minister Therese Coffey stated that “Littering is a scourge on our environment and we waste taxpayers’ money cleaning it up – funds which could be better spent in the community”.<sup>106</sup> At least one newspaper article<sup>107</sup> has compared these new fines to those in Singapore – where first-time littering offenders may be fined up to SGD\$1,000 (around AUS\$980) and/or receive a Community Work Order (CWO) of up to 12 hours. Offenders who receive a CWO must wear a bright orange jersey to identify them as litterbugs while cleaning up the area. For repeat offenders, the fine may reach SGD\$5,000 (around AUS\$4900).

#### ► IMPLEMENTATION IN AUSTRALIA

Increased littering fines increases the cost of littering for potential offenders, reducing their likelihood to litter and therefore the possibility of litter reaching our oceans. Litter dropped on the street may be carried by rainwater and wind through drains into oceans. In Singapore, a study on anti-littering campaign strategies found that nearly 85 percent of respondents considered fines effective.<sup>108</sup> Littering fines across Australia are currently much lower and more poorly implemented than in Singapore. In NSW, for example, fines for general littering are \$250. In NSW, for example, fines for littering small items are as low as \$80.<sup>109</sup>

To address littering from vehicles, the South Australian Environment Protection Authority recently launched the ‘Dob in a Litterer’ campaign. The ‘Dob in a Litterer’ app and website offers South Australians dropdown menus to identify the type, model and colour of the offending vehicle, a map to pinpoint the

exact location of the littering and a photo feature to capture evidence. Pending evaluation of its effectiveness, this program could be expanded Australia-wide. While other states enable community members to report littering from vehicles, the mechanisms available are not as easy-to-use as the South Australian features.

### 4. Recycling of fishing gear

The recycling and reuse of fishing gear is a comparatively new area in the recycling/ reuse industry. Internationally, various public and private sector schemes exist to reuse fishing nets for a different function or to recycle their plastic contents. Some governments have also implemented regulations calling for fishing gear to be recycled. In the Netherlands, the ‘Green Deal Fishery for a Clean Sea’ aims to recycle or reuse 95 percent of all fishing gear and operational and Fishing for Litter waste brought to Dutch quays by 2020 and requires that fishing vessels separate these types of waste.<sup>110</sup> As part of Norway’s 2013 waste strategy, marine litter caught in fishing gear can be handed in at zero cost and fishing gear can be recycled.<sup>111</sup> Since 2013, the Healthy Seas initiative (which removes waste, particularly fishing nets, from oceans to recycle them into yarn for new products) has seen a 660 percent increase in the weight of fishing gear recovered from oceans and recycled.<sup>112</sup>

The US-based Fishing for Energy partnership seeks to decrease the amount of DFG by providing commercial fishermen with no-cost opportunities to dispose of old fishing gear and by offering grant support for innovations to prevent loss and reduce impact of gear. Both the National Oceanic and Atmospheric Administration Marine Litter Program and the National Fish and Wildlife Foundation are part of the partnership.<sup>113</sup>

#### ► IMPLEMENTATION IN AUSTRALIA

Australia currently has no government-level recycling strategy for fishing gear. The government could work towards developing one, using the Product Stewardship Act as a means to do so. Alongside grants that are provided for

recycling innovations more generally, there could also be grants specifically provided to companies focused on developing strategies to collect and recycle derelict fishing gear. The introduction of mechanisms to discourage littering behaviour (for example, fines) would increase the costs of dumping derelict fishing gear for the offender.

### Removal: Remove existing marine litter

While prevention of marine litter is more effective than response, removal of marine litter is nevertheless necessary to target the litter that has already accumulated.

#### 1. Fishing gear removal schemes

Fishing gear removal schemes often involve fishermen and sometimes use financial incentives. Where payments are involved, these “gear buy back” schemes encourage fishermen or other groups to bring marine litter back to shore for a reward. In South Korea, fishermen are provided with durable bags to collect litter while at sea. However, this can be damaging to the environment as fishermen are not trained to remove lost nets, thus potentially damaging marine habitats.<sup>114</sup> In contrast, a pilot project in Hawaii encouraged fishermen to report derelict fishing nets at sea. Trained volunteers then visited the reported location to remove the fishing gear. Once the gear was removed, the fishermen were awarded cash based on the weight of the reported gear.<sup>115</sup>

Other countries including Norway and Sweden conduct regular operations to recover lost gear. In Norway, the Directorate of Fisheries retrieves lost gill nets on a yearly basis and facilitates a system for fishermen to report the location of derelict fishing gear, reducing the likelihood of damage to the gear and improving the chances of recovery if lost.

#### ► IMPLEMENTATION IN AUSTRALIA

In Australia, the Global Ghost Gear Initiative – a multi-stakeholder alliance to find solutions to the derelict fishing gear problem – has coupled with GhostNets Australia to work towards a shared vision of an ocean free from ghost nets.

Initially, GhostNets Australia supports coastal Indigenous communities who want to clear nets from beaches as part of looking after ‘country’. Support includes funding Indigenous rangers for their work, providing training in data collection and ghost net identification and supplying resources. The collected nets have been reused in artwork and merchandise, providing local communities with an alternative income source. Since 2004, more than 13,000 pieces of net have been recorded in the GhostNets Australia database, creating a comprehensive overview of the ghost nets impacting northern Australia.<sup>116</sup> While initially funded from the National Heritage Trust, GhostNets Australia no longer receives direct funding from the Department of the Environment.<sup>117</sup>

Due to the dangers derelict fishing gear poses to oceans and marine ecosystems, funding should be reinstated for GhostNets Australia. In addition, due to the expenses involved (about USD\$4,960 or AUD\$6,700 for each acre of net),<sup>118</sup> any government-led derelict fishing gear removal program should specifically target very harmful gear, such as discarded gillnets, or use a recycling initiative in which the source of funding is the recycling market rather than taxes.

#### 2. Total Maximum Daily Load

The *Clean Water Act* (USA) requires states to submit a ‘Section 303(d)’ list to the Environment Protection Authority every two years. The list identifies water bodies that are experiencing insufficient water quality standards due to poor pollution controls. States must develop measures to improve water quality standards before a water body is removed from the list. An example of such a measure is a Total Maximum Daily Load (TMDL), which is a maximum allowable limit for rubbish in water bodies. In establishing a TMDL, all sources of pollutants are identified, and each source is assigned a maximum amount of pollutant it can release. The amount is set low enough such that water quality standards can support living resources and public health, among other goals.<sup>119</sup>



### ► IMPLEMENTATION IN AUSTRALIA

As in the US, adopting a source-based approach is likely to be more successful in Australia,<sup>120</sup> however, only Queensland has thus far developed such an approach. To manage the Great Barrier Reef, the Queensland state government and the federal government have developed an integrated approach. The approach thus far involves both targets for ambient water quality and steps towards legal requirements for individual pollution sources.<sup>121</sup> Similar to the TMDL, Queensland recently developed new targets for loads of sediment, nutrients and pesticides for rivers draining to the Great Barrier Reef.<sup>122</sup> It would not be too difficult to develop similar targets for macro and micro plastics although the methodology would need significant revisions.

Environmental legislative powers are not granted to the federal government under the Australian Constitution. However, the Commonwealth can encourage states to adopt point-source water regulations, perhaps by linking incentives to other federal provisions, as well as use the EPBC Act to direct attention to water quality issues in Commonwealth marine and transboundary areas.

### 3. Fishing for Litter

Fishing for Litter initiatives involve fishermen in removing marine litter caught in their fishing nets during normal fishing operations. The litter is placed in bags, which are deposited on quaysides where harbour staff move them to dedicated skips or bins for disposal. While originally developed by the North Sea Directorate of the Dutch Government and the Dutch Fisheries Association in 2000,<sup>123</sup> the program is now active in the UK, the Netherlands, Sweden and the Faroe Islands and has been recommended by OSPAR (a collection of governments who seek to conserve the North-East Atlantic).<sup>124</sup>

### ► IMPLEMENTATION IN AUSTRALIA

Fishing for Litter should be viewed as a useful last option as it only addresses certain types of marine litter and not, for example, microplastics. Other issues include determining the optimal balance between carbon dioxide

emissions from extra fishing duties and the potential to catch untargeted bycatch with the benefits of removing marine litter. If Australia wishes to implement a Fishing for Litter initiative, it would do well to learn from the experiences of Norway, who conducted a two-year trial project to gain insights into how the project can best be organised.<sup>125</sup>

### Education: Increase public understanding of the causes and impacts of harmful marine litter to generate behaviour change

Behaviour-changing measures such as those focused on education engage people in activities to reduce marine litter. Such measures aim to encourage the notion of waste as a resource, the selection of products that generate lower quantities of litter, the disposal of waste in a more environmentally-friendly way and participation in beach clean-ups.

#### 1. Social media campaigns

Social media campaigns can be used to encourage and highlight the role of citizens in tackling marine litter. Examples abound including the Clean Seas Photo Challenge (whereby global citizens submit images and stories showing threats to marine ecosystems with the possibility to win a trip to the International Marine Debris Conference) and the #ISpeakBlueToo awareness campaign (to raise awareness about the state of oceans and that people around the world share the same oceans).

The campaign, 'Single-use plastics: are you #ReadyToChange?', was launched by the European Commission and stresses the importance of consumption choices in making European plastic products more durable, reusable and recyclable. The campaign includes a video, which challenges the common perception of single-use plastics as convenient items, sharable social media content showcasing the attractiveness of single-use plastic items and how to resist them, and an informative web platform, which provides information on relevant EU actions and initiatives.

### ► IMPLEMENTATION IN AUSTRALIA

In Australia, the 'Straw No More' campaign was set up by a young girl from Cairns and uses social pressure to encourage schools to phase out straws. The campaign has succeeded in making the Cairns Regional Council resolve to take steps towards removing single-use plastics from Council events and venues.<sup>126</sup> A similar campaign, 'The Last Straw on the Great Barrier' Reef campaign, has seen more than thirty tourism operators in Cairns and Port Douglas sign-up to ban plastic straws.<sup>127</sup> These are examples of grassroots campaigns that would benefit from federal support.

The reason targeted campaigns are so successful is because they target a specific product (for example, straws) instead of a general concept (for example, keeping oceans clean). They also reach a broad audience through, for example, social media ads, commercials, billboards and bus stop and train ads. Additionally, Australian policymakers could use social media campaigns to rebrand "disposable" items as "reusable". For instance, reusing disposable plastic carryout bags as garbage bin liners may make them much more environmentally friendly than cotton reusable bags. Take-out containers can also be reused as Tupperware.



### 2. Marine Debris Program education and outreach

The National Oceanic and Atmospheric Administration (NOAA) Marine Debris Program (MDP) leads education and outreach initiatives across the USA to educate the public about the causes and impacts of marine litter and to encourage behaviour change. Supported by the program's Prevention through Education and Outreach grants and the Fishing for Energy program, the program has staff in coastal areas that engage in school education programs, participate in outreach at regional events, facilitate teacher workshops and engage with local stakeholders.<sup>128</sup> Education and Outreach grants are offered nationally on a competitive basis and support activities that involve audiences in behaviour-changing initiatives and decrease marine litter.<sup>129</sup>

### ► IMPLEMENTATION IN AUSTRALIA

In Australia, such initiatives could be developed at a local council level and catered towards the unique challenges of that LGA. The goal of the 'Communities taking control' campaign by the Boomerang Alliance is to produce a 'how to' guide for communities seeking to reduce their plastic footprints. It has two pilot communities – Noosa in Queensland and Wollongong in NSW.<sup>130</sup> In Queensland, the Great Barrier Reef Marine Park Authority's Reef Guardian program is working with those who use and rely on the Reef and surrounding areas to build a healthier Reef.

Lessons from these programs, as well as from the Marine Debris Program, can help shape community responses to marine litter. These programs, for example, stress the importance of engaging the scientific and wider community through grants and local schools through education. While the Reef Guardian Schools initiative engages over 270 schools, 7400 teachers and 120,000 students in building awareness about the Reef,<sup>131</sup> the Marine Debris Program provided USD\$1,238,358 of funding towards marine debris removal efforts in 2017.<sup>132</sup> Consideration could be given to coordinating the education and outreach initiatives through a centralised program, like the Marine Debris Program, and providing federal funding.





## Research: Conduct research on the impacts of marine litter including plastic on marine species

Research efforts in various countries examine the magnitude, impacts and sources of marine litter. The programs are often coordinated and partially funded by national research programs, while citizens, local organisations, universities and government agencies conduct monitoring and research activities. Research groups have also worked on generating priority research questions to improve our understanding of the issue.<sup>133</sup>

### 1. EU Marine LitterWatch Program

The European Environment Agency has developed the Marine LitterWatch mobile app to boost the information base needed for European policymaking on marine litter. Although EU member states understand that marine litter is an increasing concern, the program provides an essential source of data. Marine LitterWatch combines citizen engagement and modern technology to empower local communities in providing relevant data while creating awareness about marine litter.<sup>134</sup>

The initiative offers tools including a mobile app, a web portal and a public database. Communities

organise beach clean-ups and monitoring events and report litter items using the mobile app. Marine litter communities can use the web portal to easily manage events and data collection and to share their knowledge and co-create methods to tackle marine litter.

### ► IMPLEMENTATION IN AUSTRALIA

The EU Marine LitterWatch Program offers a clever example of how modern technology and citizen engagement can combine to support environmental initiatives. Australian policymakers can draw on this example to develop their own ways of combining technology and citizen communities to suit the Australian context. While Australia already has such campaigns as ‘Dob in a Litterer’, there is capacity for targeted Government initiatives to combine technology and active citizens.

### 2. Pechpopre

Covering 2017 and the first half of 2018, “Pechpopre” (French for clean fishing) is a 20-month project lead by the French “Cooperative Maritime” with support from the French government and the French Plastic value chain. The project aims to compile an inventory of the plastic products used by fisheries and

the collection systems that exist to collect those products at the end of their lifecycles. In 2018, the project is looking at benchmarking the results from France with existing solutions in other EU member states that border the North Sea, the Atlantic Ocean and the Mediterranean Sea.<sup>135</sup>

### ► IMPLEMENTATION IN AUSTRALIA

The International Maritime Organization’s ‘Global integrated shipping information system’ provides information on waste reception facilities in Australian ports. However, an inventory of the plastic products used by fisheries would be useful in Australia. The initiative could be an extension to the work of the CSIRO, which conducts research into the sources, distribution and impacts of marine litter, and could potentially be supported by government grants. Knowledge of these aspects would increase the information base and aid understanding of how to improve plastic management in fisheries.

### 3. MARELITT Baltic project

The MARELITT Baltic project is the first transnational initiative to provide a comprehensive solution to approaching derelict fishing gear. By turning a complex problem into a

clear and understandable topic, the project aims to develop cost-effective and environmentally friendly derelict fishing gear removal, prevention and recycling methods. Other aims include increasing responsible fishery through developing a code of conduct for the fishing industry and an overall reduction of derelict fishing gear. The project has so far compiled a recommendation paper aimed at the national and EU level and an overview on harbour reception facilities for derelict fishing gear and old fishing gear to improve waste management. Another project in the pipeline is a feasibility study on economic solutions for derelict fishing gear recycling.<sup>136</sup>

### ► IMPLEMENTATION IN AUSTRALIA

The MARELITT Baltic project recommendations may be useful for Australian waste management initiatives such as the Global Ghost Gear Initiative who aim to build evidence, define best practices and contribute to policies on derelict fishing gear. Like other research initiatives, it could be supported by government grants at the federal and/or state and territory levels.





## PART 5: NATION-WIDE IMPLEMENTATION OF THESE CHANGES REQUIRES THE MUTUAL SUPPORT OF ALL STATES AND TERRITORIES

Although mechanisms, such as the EPBC Act, exist to guide the federal government's approach to environmental regulation, such mechanisms can be ineffective without the support of the states, territories and LGAs.

Without changes to regulations and increased national leadership on these issues, there remains a need for local and state governments to interact with NGOs (such as the Tangaroa Blue Foundation) in some coordinated way as these are the groups with the most influence over environmental policies in Australia. If coordinated action is not possible, little change can be evoked.

### The Constitution limits the potential for national leadership on environmental regulations

Under the Constitution, the federal government's ability to implement meaningful environmental changes is severely limited. Lacking specific environmental regulatory powers, the residual powers (those that remain after other powers are attributed to the federal level) are passed onto the states.<sup>137</sup> The states, in turn, are responsible for:

- Developing and implementing policy regarding environmental matters that are not the responsibility of the federal government or other states;
- The policy, legislative and administrative framework of resources within the state;
- Directing Australia's position regarding international agreements on the environment that impact matters for which states are responsible; and
- Assisting with developing national environmental policies and standards.<sup>138</sup>

Generally speaking, the federal government is only able to intervene in environmental policies if there is a significant impact on a Matter of National Environmental Significance (MNES) under the EPBC Act. If a development does not trigger the significant impact threshold of the EPBC Act (which is subjective and determined by the acting Environmental Minister), the federal government is unable to act. According to the Environmental Defenders' Office:

"Overall, the EPBC Act alone is not sufficient to regulate marine plastics, as the main sources of pollution originate with plastic production and disposal, which are chiefly within the jurisdiction of state laws."<sup>139</sup>



## National leadership is essential

Environmental Justice Australia summarises the failings of the EPBC Act as:

- Fragmentation: the model of governance is fragmented and decentralised, leaving no one jurisdiction in charge;
- Variable standards: environmental protection standards vary considerably between states. While some states have relatively well-developed laws (e.g. NSW), such laws are virtually non-existent in other states and territories (e.g. South Australia and Western Australia); and
- Confusion about the allocation of responsibilities: in practice, the EPBC's premise of relying on states and territories means that the federal governments' assumption of partial responsibility is matched by ever-decreasing responsibility by the states.<sup>140</sup>

States and territories differ in their approaches to environmentally sustainable development. Although the implementation of a plastic bag ban by Woolworths and Coles has gained much media attention in NSW, it is notable that NSW will soon be the only state without a state-wide policy. National leadership is essential to implement policies regarding non-biodegradable single-use plastic bags uniformly across Australia.

Environmentally harmful activities such as land clearing and water pollution are only covered by the EPBC Act if they directly impact a MNES such as a World Heritage area, a threatened species (which is specifically covered by the Act) or an ecological community. If this connection is unclear, no environmental assessment through the EPBC Act can occur and the threat will not be protected by the Act.

To the above list, we add a fourth failing:

- Potential conflicts of interest: if the federal government is unable to assess the threat under the EPBC Act, the full responsibility passes to states who may face conflicts of interest.

As the Environmental Farmers Network argues, the federal government may be able to see issues more objectively and consistently than state regulators who are more closely involved.<sup>141</sup> The Lock the Gate Alliance also acknowledges possible conflicts of interests at the state level.<sup>142</sup>

Collectively, these failings imply that national leadership is essential. As the impacts of marine litter are diverse, so must be the solutions, requiring a whole-of-government approach. National leadership can help ensure some continuity, which is essential due to the long-term nature of environmental management, and better deal with environmental matters that transcend state borders. Without nationally consistent monitoring and reporting, evidence-based decision making is difficult for governments to achieve and businesses must comply with many different, often-changing regulatory frameworks.<sup>143</sup>

### CASE STUDY

## CASE STUDY 1: THE UNITED KINGDOM

**In the UK, national regulatory agencies are tasked with enforcing environmental and climate change rules:**

- **The Environmental Agency (EA) in England;**
- **Natural Resources Wales in Wales;**
- **The Scottish Environment Protection Agency (SEPA) in Scotland; and**
- **The Northern Ireland Environment Agency (NIEA) in Northern Ireland.**

These agencies regulate major industry and waste management, water quality, natural resources and the treatment of contaminated land. They are also responsible for managing flood risks and conservation and ecology issues and for regulating fisheries, harbour navigation, estuaries and inland rivers. The agencies are overseen by their respective government body responsible for environmental protection policy; for example, Defra in the UK.

Particular environmental responsibilities are the responsibility of local authorities, including municipal waste management, the regulation of emissions from smaller industrial plants and contaminated land (except where the land is specifically regulated by the national regulatory agency).<sup>144</sup>

### CASE STUDY

## CASE STUDY 2: NEW ZEALAND

**In New Zealand, the central government is responsible for developing national policies and environmental standards that target environmental issues affecting the whole nation (e.g. management of coastal zones).**

They also administrate environmental Acts to ensure appropriate actions are taken and that the legal provisions in the Acts do not impede good environmental management.

Under the *Resource Management Act 1991*, regional councils must draft Regional Policy Statements identifying significant environmental issues and responses in their region. All statements and plans must be consistent with the national policy statements and environmental standards in place at the time. Similarly, territorial authorities must draft district plans identifying significant environmental issues for the district and establishing restrictions and controls on land use and subdivisions. They must consider issues in Regional Policy Statements and regional plans and relevant national policy statements or environmental standards.







## Australia must develop capacity for national leadership on environmental matters

### **OPTION 1:** THE FEDERAL GOVERNMENT COULD APPOINT AN INDEPENDENT NATIONAL WASTE AND RESOURCE RECOVERY COMMISSIONER

The appointment of an independent National Waste and Resource Recovery Commissioner would help address recycling and product stewardship policy for problem plastics. At present, there is a long lead-time for new product regulations under the Product Stewardship Act. While packaging was listed to be regulated for four years from 2011, it was not listed in 2015-2016,<sup>145</sup> implying a missed opportunity (perhaps due to a change in governance). The appointment of a commissioner for this task, supported by a high-powered stakeholder committee, could help fast-track the approval and assessment process and make the Act more effective.

### **OPTION 2:** THE FEDERAL GOVERNMENT COULD ESTABLISH A NATIONAL ENVIRONMENTAL PROTECTION AGENCY

Currently, each state and territory has a separate Environment Protection Agency (EPA). Their purpose is to improve environmental performance and waste management in that particular state or territory, resulting in inconsistencies between states. An independent, national EPA would help achieve national consistency. The national EPA must work at arm's length from the federal government (in this way, differentiating itself from the current Department of the Environment and Energy) and could involve states and territories in nationally consistent decision-making processes. It could set standards and baselines for matters of environmental significance, oversee compliance and reinforcement and create national objectives and targets. The National EPA could also be responsible for joining and developing regional initiatives, such as the Commonwealth Clean Oceans Alliance, and for ensuring that states and territories comply with these measures. The current Environmental Minister and other federal ministers from all parties should be able to advocate to the national EPA.

### **OPTION 3:** THE FEDERAL GOVERNMENT COULD DEVELOP A RATCHET MECHANISM FOR STATES AND TERRITORIES

The idea of a “ratchet”, or “ambition”, mechanism gained traction under the Paris Agreement. The mechanism requires countries to gather every five years to consider progress and submit climate action plans that are progressively more ambitious until global temperatures are stabilised. The federal government could investigate ways to apply such a mechanism to Australian states and territories. For example, if one state or territory sets a higher standard (such as the percentage share of combined energy from renewables), other states and territories could be given a legal length of time to follow the new Australian best practice provided that the standard can be proven to be feasible and functional.

### **OPTION 4:** THE EPBC ACT COULD BE STRENGTHENED AND BROADENED TO INCLUDE OTHER MATTERS OF ENVIRONMENTAL SIGNIFICANCE

Currently, the EPBC Act requires the Environment Minister to undertake a lengthy assessment and approval process after deciding that a proposed action is likely to significantly impact a matter protected by the Act. However, rather than relying on this lengthy process, any actions that are likely to meet or exceed the significant impact threshold set out by the EPBC Act should be prevented. To achieve this, the federal government may want to consider ways to directly target sources that negatively impact matters of national environmental significance. The EPBC Act could also be extended to cover other environmental matters including land clearing and water pollution as their effects extend to all states and businesses operating between states.



## CONCLUSION

The shockingly high incidences of Australian marine life ingesting and becoming entangled in marine litter suggests that our ecosystems are at threat by our current production and waste disposal systems and that Australia, as a country, has a national responsibility to act. Only through strategic and deliberate action, involving multiple layers of stakeholders, will we be able to prevent further destruction of marine ecosystems, with extended threats to our economy and potentially human health.

This report has provided a comprehensive overview of steps that are currently being taken around the world to decrease our human impact on the world's oceans and how the federal government can consider these strategies in their own planning. However, perhaps more pressing than simply implementing strategies, is the need for national leadership on these issues. Without national leadership, and the regulation required to achieve it, the current process of passing environmental responsibilities to states and territories will continue to lead to inconsistent and potentially inefficient ways of addressing marine litter and other environmental issues.

The report supports the common finding that plastic is the main and most deadly type of marine litter. However, while it is important to establish the types of marine litter that are most prevalent as this adds to our knowledge base, we cannot stop there. New strategies are desperately required, both in Australia and around the world, that address the prevalence of marine litter as a whole. New strategies are required that encourage the participation of entire communities in tackling the prevailing issue of marine litter. Only with the engagement of diverse stakeholder groups, including governments, private enterprises and civil society can we begin to overhaul the production, use and waste management systems that have lead us to the mess we, and our oceans, currently face.

As a final recommendation, Australian policymakers must set concrete targets around reducing the amount of marine litter in our oceans. While both the 2015 Senate report as well as the 2018 Threat Abatement Plan do not establish concrete objectives, such targets would give Australia and various stakeholders standards to work towards in ensuring a sustainable future.



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