

Plastic Pollution: our oceans are in crisis but is there a solution?

Plastic pollution has become one of the most significant environmental issues, as rapidly increasing production of disposable plastic products devastates the world's capability to deal with them (Parker, 2019). Plastic pollution is the gathering of plastics in the natural environment, having many different effects on the surrounding animal and human habitats. In 1907 the invention of Bakelite, the first form of synthetic plastic, brought about an uproar in these materials. By the end of the 20th century, however, plastics were found to be common pollutants of many environments. Whether it's being mistaken for food by animals or flooding lowland areas by clogging drainage systems, plastics have drawn increasing attention as a large-scale pollutant (Moore, 2020). But just how much plastic is entering our oceans? A study completed in 2019 estimated about sixty seven million tonnes of waste enters the ocean, through rivers every year (Murray-Atfield, 2019). Plastic has toxic chemicals that damage the environment and cause land, water, and air pollution. It can take hundreds or thousands of years for plastic to break down, so the damage to the environment is very much long lasting (Madaan, 2019).

After the 1950's, plastic production went into full speed. Throughout these years there was an increase in all different types of plastic, with silicon gels and acrylics being new and popular materials. The transformation of plastic, with the improvements made to today's technology, allows for plastic to become an even more effective material (Quinn, Perez, Estrada and Hinds, 2013). Plastic is a versatile, lightweight, strong, and relatively economical material.



Figure 1. A local beach found with shores full of plastics. Photograph: Not Credited (2018)

Those are the virtues that lead us, to such a high need of plastic goods (Le Guern, 2019). The demand for plastic products in the past several decades has been astonishing. Humans are producing over 300 million tons of plastic every year, 50% of which is for single-use purposes, more than 8 million tons of this plastic is discarded into our oceans (Plastic Oceans Foundation, n.d.), and only about

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10% of that 300 million tons is recycled (Wassner, 2011). With this much waste going into the ocean, some of it is bound to end up on our shores. As shown in a beach clean-up experiment (Figure 1), done by the Ocean Conservancy in 2017, around 72% of waste found on beaches is some form of plastic product (SLO Active, 2020). Another main form of polluting plastic is micro plastic. Micro plastics end up in our oceans, one of the main sources being our clothing. Tiny fibres of acrylic, spandex, nylon and polyester are shed each time we wash our clothing and are discarded into the ocean. A study in 2016, conducted by experts at the University of California, found that washing a single synthetic jacket once, released an average of 1.7 grams of microfibers into our environment (UN Environment, 2018).



Plastic contains toxic substances that damage the earth. Majority of the pollution in the ocean is from plastic, and it has a horrible impact on marine species. Therefore, it can upset the economy and food supply for areas that rely on fishing. Plastic can hurt smaller organisms like plankton, which larger animals

depend on for food. The toxins work their way through food chains and can be

Figure 2. A dissected shearwater bird taken found in the fish people are eating (Madaan, from Lord Howe Island, with plastic pieces 2019). Being tangled in, or digestion of plastic from its stomach arranged beside it.

Photograph: Jennifer Lavers (2017)

fragments, during the years of 1974-2008, has impacted at least 77 species of marine life

found in Australia. The affected species include: 12 species of cetaceans (whales, dolphins or porpoises), at least 34 species of seabirds and dugongs, six species of sea turtles, 10 species of sharks and rays, and at least eight other species (Department of Agriculture, Water and the Environment, 2009). It is highly likely

that in the long term, hundreds of species will be endangered or extinct, meaning that fisheries may collapse and the oceans will go into a slight recession. As the marine environment has always been an important source of protein in the world's dietary needs, it is plausible that even a small decline in the involvement of the oceans influences on human's nutrition and diet needs could result in famine and riots (Linton, n.d).

Many different companies over the world have been trying many different techniques to remove plastic form our oceans, one of these being the Sea Bin Project, Australia. The sea bin project was created by two friends, Andrew Turton and Pete Ceglinski, whom after became frustrated with the amount of plastic causing pollution in our oceans, decided to act upon it. They quit their day jobs, to design and produce these filtering bins to place in the sea. They're created from recycled plastic, with a built in pump and filter. The pump creates a vacuum, sucking in any floating objects from the ocean, into the netting of the bin

(Sea Bin Australia, 2015). As one of many countries across the globe, in 2016, France became the first country to declare a total ban on plastic plates, cups and cutlery. Followed by Seattle, United States of America in 2018, banning all plastic straws and cutlery in restaurants and bars, in a push to prevent marine plastic pollution and reduce waste (Calderwood, 2018). In 2008, John Kellett created the Inner Harbour Water Wheel (see figure 3), or more commonly known in the US as 'Mr Trash Wheel'. A machine designed to remove general waste

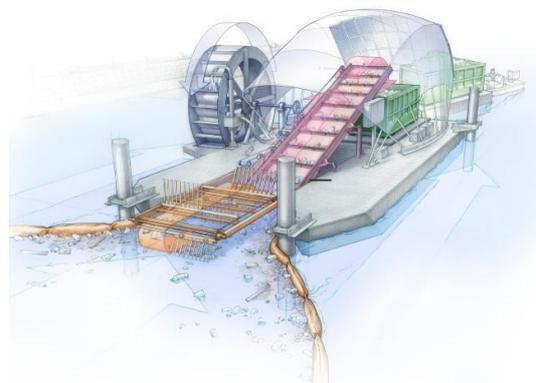


Figure 3. A diagram of the Inner Harbour Water Wheel, designed by John Kellett (2017)

and plastics from the inner harbours of the east coast of the United States. Kellett worked on the Inner Harbour in Baltimore, for years and after seeing floating rubbish in the water every day for years, approached the city and offered to attempt to clean the harbour. The wheel was installed in 2008, and

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still runs to this day, cleaning the harbour and also collecting waste from the Jones Falls River (Snow, 2017). The wheel is completely eco-friendly, being run on solar power and hydropower. In just a few short years, this machine has made such an impact upon one area, therefore could we improve this invention, and help clean the oceans on a much larger scale?

Plastic pollution is one of the biggest issues our world is currently facing. Because plastic is so versatile and inexpensive, it is one of the most used materials across the planet. However, plastic is slowly killing our oceans. As the human race, we have a responsibility for our future generations, to protect the earth. This epidemic is ruining our oceans, and every living organism within them. Marine species are being massively affected, which has an impact on our economy, specifically the fishing industries; thus only growing worse. We can prevent and reduce plastic in our oceans by reducing or banning single-use and any other plastic-based material. We can implement different machines or inventions that have been specifically designed to tackle plastic pollution. It's just a matter of how and when we act upon this, to make a difference and save our oceans.

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