

Protecting Our 75%

Situated on the North Shore, students at Takapuna Grammar often frequent at our surrounding beaches – Narrow Neck, St Leonards and Takapuna Beach. These locations act as a route to get to school as well as a source of leisure for many students. Despite the fluctuating weather we experience in New Zealand, beaches regularly attract crowds of families and friends. As a result, our beaches can be noticeably littered with plastics, cigarette butts, and debris, which all contribute towards marine pollution. However, nurdles - one of the top causes of marine pollution go unnoticed by most.

What are nurdles?

Nurdles are another name for “pre-production plastic pellets”. They may sound harmless, but these can be considered the raw material of the plastic industry. Widely used by manufacturers, nurdles are the building blocks for plastic bags, plastic bottles, plastic straws and almost anything that’s made of plastic. Billions and billions of pellets are melted down and used every year to satisfy consumer needs of plastic made goods. Hence, it is not uncommon for nurdles to spill into our oceans when they are moved in large quantities. Last year, New Zealand imported almost 21000 tonnes of nurdles and 61% of that is used for packaging.



Figure 1 Nurdles collected during a beach clean-up

How do nurdles end up in the ocean?

From distribution points to factories, nurdles can spill at any stage. Once spilt, these pellets can be easily lost through water drains in factories or unsecured valves during transit and into the environment. As nurdles are small, the slightest opening in their packaging will result in spills. Eventually, all these small spills will be the cause of a big environmental and marine issue. There have also been many situations where large-scale spills have occurred at sea. In June 2018, a plastics company in New Zealand spilt thousands of nurdles into Wellington Harbour. Locals were able to organise clean-ups, which resulted in over 850 nurdles being collected. This means that a huge majority of what was spilt ended up in our marine environment instead.

Are nurdles poisonous?

With all the fuss about nurdles, you might be wondering – why are they so harmful to the marine environment? Are they poisonous? Although nurdles are not poisonous themselves, they attract many dangerous chemicals once at sea. These chemicals are known as Persistent Bioaccumulating Toxins (PBTs). PBTs are industrial compounds that resist degradation, have high mobility in the environment and are extremely toxic. Due to the risk of harming the marine environment and other people, production of PBTs have been significantly reduced in recent

years. However, these compounds remain in our oceans. Nurdles act as a medium for PBTs to latch onto and can contain an exceedingly dangerous concentration of these chemicals. Furthermore, some pellets are made with chemicals such as bisphenol A (BPA) and phthalates that alters their properties. Banned in several countries, BPA and phthalates have links to cancer, diabetes, obesity and Alzheimer's. Despite this, New Zealand still uses these two chemicals within plastic production of food packaging.

How does this impact marine life?

In 2016, Fidra, a charity based in Scotland, released an estimate that 53 billion nurdles are being lost to sea from the UK every year. 53 billion pellets would be the equivalent of approximately 88 million plastic bottles. What's worse is that while plastic bottles need time to break down into sections that can marine life can ingest, nurdles are always available for ingestion.



Figure 2 Fish found dead after consuming nurdles

In the ocean, nurdles are easily confused with fish eggs, which are commonly consumed by birds and fish. These pellets also mix in with sand and soil, effectively harming any invertebrates or birds looking for grains or seeds. Since plastic is not digestible, ingested nurdles will remain in the animal's digestive track and cause digestive blockages. Smaller fish are usually more susceptible to the effects of nurdles while larger fish consume these smaller fish, essentially adding plastic pellets into the food chain. Us humans will

then consume these larger fish, which populate much of the seafood section of local supermarkets.

What can we do?

Living in an island country in the Pacific Ocean, marine life and agriculture play a huge role in the daily lives of many people. Recently, plastic litter has become a known topic within communities along with the government's recent decision to ban plastic bags. What about all the other single use plastic products? Or nurdles?

Through discussing this matter with a teacher, who has extensive knowledge of integrated geography, I realised that the source of the problem must be addressed. We agreed that the plastic industry must change for this issue to be solved. Currently, there is an international program called Operation Clean Sweep designed and supported by The British Plastics Federation and Plastics Europe. The purpose of this initiative is to prevent nurdles, flakes and powder from being discharged into the ocean. As of now, there are hundreds of companies across 23 countries that have pledged with this program. They are now working with sustainable and environmentally friendly practices. However, what would it be like if the plastic industry and the public had a different view on plastic?

What if plastic was no longer something we just threw away as soon as its use was completed? Just as a recycling job gives plastic a renewed value, people would be motivated to recycle or reuse plastic if there was an incentive. Social plastic could be the solution. By increasing the rewards granted through recycling, plastic products and nurdles would be too valuable for both the plastic industry and public to risk losing to the ocean. These plastics could then be sold to companies like Marks & Spencer, L'Oréal and PepsiCo who aim to produce 100% recyclable or compostable packaging. This would reduce the amount of nurdles melted, help keep marine environments clean and the development of poverty-ridden communities.



Figure 3 A social plastics centre in Haiti

Picture sources:

<http://stfrancistoday.com/wp-content/uploads/2018/05/fish-ingested-nurdles.jpg>

https://cdn-images-1.medium.com/max/500/1*wix_9zsNuNxma0SyqG7eNQ.jpeg