Plastics and Te Wai Whau, Tāmaki Makaurau-Auckland

Plastics are used in all areas of modern life due to their high versatility, resilience, low weight and low price. It therefore makes up the majority of the litter polluting the environment. While these properties have meant that plastics have brought significant benefits, from medicine to motor vehicles, these very same properties are causing it to be a problem in the environment. Plastic pollution is now considered to be ubiquitous, found from the North Pole to South Pole, and from the deepest ocean trenches to the highest mountain top. Plastics of all sizes are now recognised to be of concern globally, potentially affecting all ecosystems and organisms it comes in contact with, including humans.

Te Wai Whau (the Whau River) is an important part of life for the communities that live in and around the awa. The Whau's waters (and its plastic pollution) mostly come from the awa's terrestrial catchment but also has an oceanic source, via the Waitematā Harbour.

Rubbish collected during brand audits, including legacy rubbish such as trolleys, household electronics and food packaging

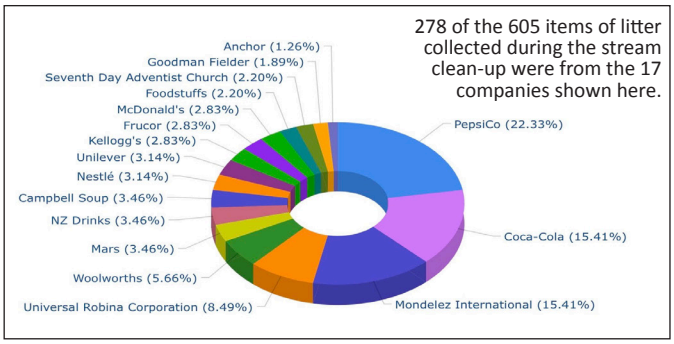
Macroplastic (>2.5 cm) pollution in te Whau was documented and brands identified during several stream clean-ups carried out by EcoMatters, the Whau community and MA student Matt Peryman. The brand audits identified that plastic pollution sourced from both ***international brands,*** including Coco-Cola and Nestlé, and ***local brands*** such as Pams and Tip Top, were present in the collected litter that had been discarded by people in the area. Many of the brands identified as polluting the awa were found to use ***greenwashing*** in their product marketing - this is when the environmentally friendly nature of the product is overstated making it more attractive to buyers looking to reduce their environmental footprint.

Matt collecting rubbish at te Whau riverbank

This includes brands such as Mother Earth, Go Natural and Healtheries, who promote an eco-friendly image despite their use of non-biodegradable single-use plastics.

The results of this study will be communicated with businesses, community leaders, and policy makers to work towards systemic change. This includes the minimisation of plastic usage across all industries to build momentum to shift towards ***plastic-free*** and ***zero waste*** refill and reuse ***solutions***, from whare to big business.

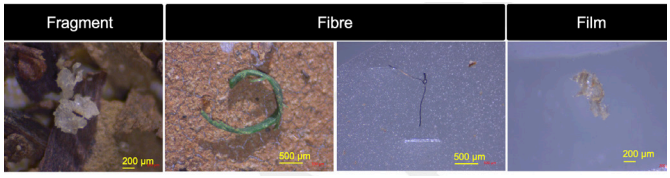
This ***kaupapa Māori*** study carried out by Matt as part of his studies explores how we might exercise our ***citizen responsibilities***, ***kaitiakitanga***, and ***rangatiratanga*** in response to the plastic pollution crisis.



Parent companies whose plastic products are polluting te Whau

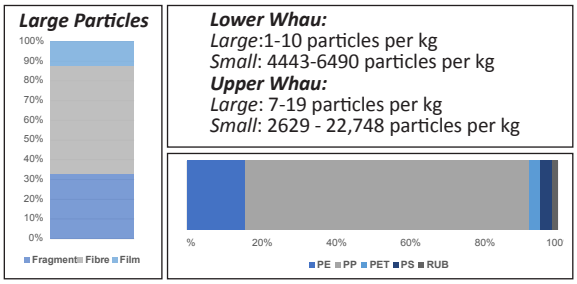
Microplastics are particles of plastic less than 5 mm in size, which can originate from the breakdown of larger plastic items, like the litter found during the clean-ups, or start out that size, like glitter. Although they are small they can have a big impact on the environment. Due to their size it is harder to determine the amounts present and require special processing and analysis. Intertidal ***sediments*** were collected from the upper and lower reaches of te Whau at low tide to see whether microplastics were present in the top 5 cm.

Size, polymer type, shape and associated chemicals are characteristics of microplastics that influence how they interact and potentially impact the environment and organisms.



Examples of a microplastic fragment, fibre and film found in intertidal sediments

Microplastic particles (either ***fragments***, ***fibres*** and ***films***) were found in every analysed sediment sample from te Whau. The polymer type were representative of those plastics used most often in everyday items: ***Polyethylene*** (PE), ***polypropylene*** (PP), ***polyethylene terephthalate*** (PET), ***polystyrene*** (PS) and ***rubber*** (RUB). Particles were separated into 'large' and 'small'. Although there are only a few large microplastics (0.3 - 5 mm) per kg of dry sediment, there were thousands of small particles (<0.3 mm), with the majority being smaller than 0.025 mm.



Levels and types of microplastics found in the intertidal sediments of the Upper and Lower wai Whau

Refuse, Reduce, Reuse, Repurpose, Recycle: As citizens, and ***kaitiaki*** we must support increased and effective government regulation around how plastics are used and consumed throughout both Aotearoa-New Zealand and globally.

Acknowledgments

We would like to express our gratitude to the Whau community for their help with the clean-ups and brand audits, and to Auckland Council for assistance with site selection and sample collection for microplastics analysis.

EcoMatters

AIM² Aotearoa Impacts & Mitigation of Microplastics