

Understanding the role of rivers in transporting plastic debris to the ocean – Te Wairere o Te Paratiki

Plastic waste makes up a large proportion of the debris collected on New Zealand beaches, with single-use plastics such as food wrappers and plastic bags being the largest culprits.

Most of the plastic in the ocean originates on land, being carried to the estuaries and coasts by rivers. Managing this plastic on land before it reaches the river could be the key to stemming the tide of marine-bound plastics. But to do this we need to answer some key questions:

- Where does all the plastic come from?
- How much and what types of plastics are carried by rivers?

Project goals

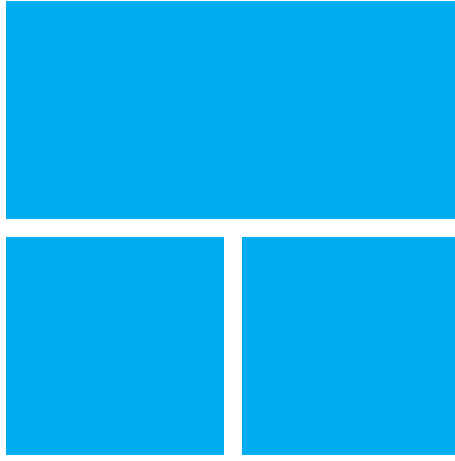
The goal of this project is to understand the sources and fate of plastic pollution carried by urban rivers using the Kaiwharawhara Stream as a case study. This knowledge will help us to improve our understanding of plastic pollution sources and pathways and identify key locations and seasons of plastic release into the environment.

Active community involvement is a vital component of freshwater restoration projects around Aotearoa-NZ. We will work with Taranaki Whānui ki te Upoko o Te Ika (Taranaki Whānui) and existing community groups to undertake plastic pollution monitoring. Co-creation of the monitoring programme with our partnerships will allow for greater education gains, capacity building for long-term benefit, and ensure the research outcomes inform local decision-making.

The Kaiwharawhara catchment

The Kaiwharawhara catchment is the largest stream system in Wellington City. The catchment has ideal conditions for this study, ranging from pristine headwaters, to increasingly urbanized residential areas, and lower reaches that are surrounded by industry and a wide range of possible plastic sources.

The Kaiwharawhara is an important awa for mana whenua, Taranaki Whānui. Since the time of settlement, Taranaki Whānui have observed extensive modifications to the catchment including, channelization and creation of underground culverts, land reclamation using waste materials, wastewater and stormwater discharges, and increased rubbish and odours. These pressures impact on the mauri of the Kaiwharawhara and the ability for mana whenua to undertake cultural practices in and around the awa.



Project plan

The design of our research will draw on a ki uta ki tai approach – from the mountains to the sea – and consider the movement and impacts of plastic pollution along the length of the Kaiwharawhara Stream.

2018-19

Develop and test protocols for monitoring of macro (more than 5 mm) and microplastics (less than 5 mm) in freshwaters. In collaboration with Taranaki Whānui, develop a cultural monitoring framework to quantify the state of plastic pollution at culturally significant sites over time.

2019-20

Quantify the different ways plastics enter the stream. Evaluate these sources, including the type and amount of plastics they contribute, and how this contribution changes over time.

Monitor plastic concentrations in water and sediment to understand seasonality of stream inputs and catchment characteristics which may influence where plastics accumulate.

2020-21

Assess how plastics change over time in the stream, breaking down into smaller pieces, and how this change is influenced by human modification to the stream environment.

In collaboration with Taranaki Whānui, describe the impacts of different plastics loads at culturally significant sites on mana whenua values.

Project benefits

This research will assist councils to identify the extent of plastic pollution transported through stormwater systems, littering and dumping and how this might be monitored and managed, such as through catchment stormwater management plans. Community-led monitoring methods will enable the public to monitor the state of plastic pollution in their rivers.

Through working with Taranaki Whānui, our research will assist in building cross-cultural understandings around the spatial and temporal impacts of plastic pollution on cultural values. It will also provide the opportunity to inform the Wellington Whaitua process.

Finally, by looking at river plastic concentrations over space and time and as a function of river characteristics, we will build better estimates of plastic inputs to the sea. Improved estimates will allow us to evaluate how well plastic reduction strategies are working.

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