

What is MTM?

Manaaki Taha Moana (MTM) is a research programme to restore and enhance coastal ecosystems and their services of importance to iwi/hapu, through a better knowledge of these ecosystems and the degradation processes that affect them.

We utilise Western Science and Mātauranga Maori knowledge and participatory modelling tools and processes to assist iwi/hapu to evaluate and define preferred options for enhancing/restoring coastal ecosystems. This evaluation of options is assisted by innovative IT and decision support tools (e.g. digital libraries, simulation modelling, interactive mapping, 3D depiction, real-time monitoring).

Action plans are being produced for improving coastal ecosystems in each rohe.

The research team works closely with iwi/hapu in the case study regions to develop tools and approaches to facilitate the uptake of this knowledge and its practical implementation.

Mechanisms will also be put in place to facilitate uptake amongst other iwi throughout NZ.



Research Providers:

School of People Environment and Planning,
Massey University

Taiao Raukawa Trust

Manaaki Te Awanui Trust

Waka Digital Ltd

Cawthron Institute

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MANAAKI TAHA MOANA: ENHANCING COASTAL ECOSYSTEMS FOR IWI

MTM Report No. 5

Ohau Loop Phase 1 Existing Status and Recommendations for Improvement



RECOMMENDED CITATION: Allen C, Doehring K, Young R, Sinner J 2011. Ōhau Loop Phase 1: Existing Status and Recommendations for Improvement. Manaaki Taha Moana Research Report No. 5. Cawthron Report No. 2041. 57 p. plus appendices.



Once a highly valued gathering area for *mahinga kai*, the **Ōhau Loop** was part of a meandering tidal section of the Ōhau River. Flood protection works on the lower Ōhau River in 1972 saw this 3.5 km meander cut off from the main flow. Today the Loop is surrounded by intensive dairy farming and has poor water quality, degraded biodiversity, and an abundance of aquatic weeds. It is proposed that the Loop be targeted for rehabilitation through the MTM programme.

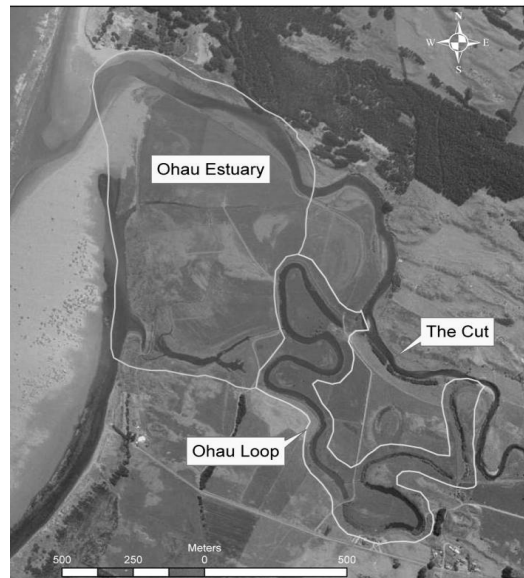
This study had two objectives: (1) To **assess the current ecological state** of the Loop and (2) to **provide recommendations on ecological rehabilitation and further research** options for the Loop.

Fish population, sediment depth, water quality, hydrology, and habitat quality were measured over a four day period in October 2011.

Channel modification and changes in land-use have had a severe impact on the morphology and ecology of the Ōhau Loop. Cessation of flow through the Loop has resulted in an accumulation of approximately 104,000 m³ of fine sediment. Much of this sediment is high in *E. coli* bacteria, indicating that contaminants have settled out in the stagnant waters and are stored in the sediment.

Water quality in the Loop ranged from good to poor. Surface water quality analyses showed that the Ōhau River had higher nitrate-N concentrations than the Loop. Water from a site close to a dairy shed showed the highest nutrient concentrations, likely due to a (now discontinued) long-term discharge of dairy effluent nearby. Dissolved oxygen (DO) saturation recorded at this site showed all measurements to be in breach of the ANZECC >80% saturation guideline (average DO saturation across all sites = 26% at night time).

Fish species richness was much lower in the Loop than in the adjacent reach of the Ōhau River (known as 'the Cut'). Native fish found in the Loop included **longfin eel, common bully and adult inanga**. One exotic species was found, rudd. The following species were found outside the Loop: black flounder, common smelt, grey mullet, brown trout, common bully, giant bully, inanga, longfin eel, shortfin eel and freshwater shrimp. In addition, whitebait (unidentified species) were also recorded.



Low DO saturation and the lack of fish passage are considered to be the most limiting factors to re-establishment of species of interest to iwi. Removing accumulated sediment and organic matter, establishing vegetation for shade to inhibit further growth of algae and hornwort, and restoring flow would all help to improve oxygen levels and fish passage.

Recommendations include:

- The removal of accumulated fine sediments from the Loop and the re-connection of adjacent lagoons to form a continuous channel connected by fish-friendly culverts.
- The flood gate at the bottom of the Loop should be replaced with a fish friendly one. This has been done as Phase 2 of the Programme.
- An as yet unspecified **flow should be diverted** from the Ōhau River into the top of the Loop to alleviate poor water quality.
- Further study is required to **calculate the flow required for contaminant dilution** whilst maintaining flood protection to property and livestock.
- More suitable **riparian fencing and planting** native species would also benefit the ecosystem services of the Loop by providing shade, habitat and filtering sediments from farm runoff.