

# 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. 15

## Cost Benefit Analysis of Riparian Planting of Waiwiri Stream, Horowhenua



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For local iwi and hapū, the Waiwiri catchment is a system of high value, a place of ancestral landscape and a significant site of Māori history. Like much of the Horowhenua coast in the 1880's, the Waiwiri catchment was once a dynamic environment adorned by native vegetation, now static dominated by high-producing exotic grassland for dairy and beef farming. Recent research for stream habitat and sources of poor water quality, recommend that riparian restoration takes place at Waiwiri stream to maximise its ecological potential.

Freshwater and resource management in New Zealand are currently under reform. The "Freshwater reform 2013 and beyond" acknowledges the significance of fresh water for New Zealanders, a decline in water quality, and an emphasis for iwi/ Māori and community engagement. The freshwater reform identifies two imperative objectives to apply to all water bodies, these objectives are defined by 12 freshwater attributes to be managed. The Resource Management Act 1991 has recently been under reform, requiring councils to use robust and thorough cost-benefit analysis (CBA) in planning decisions.

By drawing on recent policy reform, this report merges distinct disciplines such as freshwater ecology and non-market valuation. Freshwater attributes to be managed, as dictated by the Freshwater Reform, are elaborated on to better understand the processes which affect them. Given the increasing emphasis on CBA for policy appraisal, the report discusses: CBA, market failure for environmental resources, and non-market valuation, particularly choice experimenting.

A framework for understanding the benefits of riparian vegetation is presented. The framework distinguishes between te marumaru (the canopy), ngā parapara (detrital inputs) and te papa (the floor) as conduits of exchange. The framework extends to better understanding how the freshwater attributes per the freshwater reform are effected by riparian vegetation through te marumaru, ngā parapara and te papa. With the potential to mitigate the effects of land use on freshwater, some aspects of a riparian vegetation restoration project are then addressed; the efficiency of planting widths and project process from site analysis and preparation to maintenance.

The report proceeds by identifying costs, benefits and scenarios to be considered by the CBA. Costs include an opportunity cost of retiring land to riparian restoration, fencing and labour, weed control, plants and planting labour. Some benefits considered are the employment of kaitiaki (project custodians), soil retention, and willingness to pay for a change in potential algal bloom, tributary water quality and management.

The first scenario considered is one in which no action takes place in the Waiwiri catchment, which has the potential to cost almost \$11 million. Subsequent scenarios assume that both a width of 5m or 10m on both sides of the stream are retired, fenced and planted, and all drains and tributaries are fenced. At the most, 5m and 10m riparian restoration of the Waiwiri stream will cost \$2.5 million and \$3 million respectively; however the cost of either of these projects could be recovered within three years of project implementation. Furthermore, it is questionable whether some costs are costs, as locally sourced plants and labour are an injection into the local economy.

This report demonstrates that riparian vegetation restoration has the potential to restore freshwater ecosystems, and a project of this kind for the Waiwiri catchment has a positive dollar value. Research confirms that riparian vegetation is an effective means of managing freshwater attributes and mitigating relative processes of degradation that impinge on freshwater ecosystems.

The report concludes by stating that a project of riparian vegetation restoration requires significant planning. Fundamental issues are the purpose of planting and land characteristics to determine the width of land to be retired, fencing and plant selection. Alternative scenarios were considered for a riparian restoration width of 5m and 10m. A positive dollar value for a riparian vegetation restoration project for Waiwiri stream and catchment was maintained, despite the increased costs considered by the "Rolls Royce" scenario, and reducing the benefits to only a change in management or a \$1.00 increase in rates per property per week. Furthermore, locally sourced plants and labour as costs are questionable, as these "costs" are in fact injections into the local economy. Other benefits of a riparian vegetation restoration project not considered by the cost-benefit analysis are carbon absorbed, indigenous Māori values, and farm benefits.

Recommended future research includes:

- \*Māori values were briefly considered however further research required to investigate cultural values for freshwater;
- \*Choice modelling of Māori values for freshwater;
- \*Engage with land owners about a riparian vegetation restoration project;
- \*Engage with councils to plan for an appropriate course of action for riparian vegetation restoration of Waiwiri stream and catchment.

For more information:

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