

## MAKARORO SUB-CATCHMENT PLAN DRAFT

TLC The Big Picture: Tackling the big issues sub-catchment by sub-catchment



## CONTENTS

TUKITUKI CATCHMENT: THE BIG PICTURE	3
1. Introduction to The Big Picture	3
1.1. Purpose of The Big Picture	3
1.2. Freshwater status of the Tukituki catchment	4
1.3. Approach: creating priority actions in the Tukituki	4
2. Tukituki's Overall Big Picture	5
2.1. Summary of sub-catchment challenges and priorities	5
2.2. Outcome areas most sought by farmers (from workshops)	6
3. Sub-Catchment Context	7
3.1. Background	7
3.2. Sub-Catchment Context	8
3.3. Sub-Catchment Challenges and Key Focus Areas	9
3.4. Landscape Context	10





## TUKITUKI CATCHMENT: THE BIG PICTURE

### 1. Introduction to The Big Picture

#### 1.1. Purpose of The Big Picture

In 2024 Tukituki Land Care (TLC) launched The Big Picture, a six-month project designed to create independent, science-based catchment plans for the 17 sub-catchments of the Tukituki River in Central Hawke's Bay. The initiative identified each sub-catchment's unique environmental challenges and developed practical, cost-effective solutions to address them. As TLC Chair Richard Hilson explained, "We tackled the big issues sub-catchment by sub-catchment, to piece together the bigger picture."

The project employed a comprehensive research approach that combined field investigations, insights from local farmers, and an in-depth analysis of existing studies and data on the Tukituki catchment. Environmental planning consultancy, Environment, Innovation and Strategy Ltd (EIS), led by Matt Highway, undertook this work.

This project reflects TLC's dedication to improving environmental health and farm productivity, paving the way for a sustainable future for the Tukituki community.





#### 1.2. Freshwater status of the Tukituki catchment

#### Summary of State of the Environment reporting

The Tukituki catchment faces water quality, land use, and climate challenges. The catchment, dominated by sheep and beef farming, has experienced significant modifications, leaving only about 10% of its land covered in indigenous vegetation. Water scarcity is a persistent issue, with decreasing river flows over the past three decades, exacerbated by droughts and climate change. Groundwater levels in the Ruataniwha Plains are under strict management to prevent further decline, but interannual variability and climate change pose ongoing risks.

Water quality is a major concern due to high levels of nitrogen, phosphorus, and sediment. The highest nitrogen concentrations in the region occur in streams draining the Ruataniwha Plains, and some areas exceed nitrogen targets by two to four times. Phosphorus and fine sediment issues, linked to erosion, contribute to poor water clarity and degraded aquatic habitats. Toxic algae, particularly Phormidium cyanobacteria, can proliferate in the river during low summer flows, posing a risk to both human and animal health. Despite these issues, the Tukituki River remains generally swimmable, except after heavy rainfall when contaminant levels rise.

#### 1.3. Approach: creating priority actions in the Tukituki

The Big Picture project adopted a highly collaborative approach involving detailed catchment research, GIS mapping, and farmer engagement. Workshops were conducted with local farmers in each sub-catchment to better understand group dynamics, gather community values, and identify key issues and opportunities. Feedback from the workshops, survey results, and field investigations have been used to shape tailored sub-catchment plans aligning with the local communities' specific landscape context and aspirations.

As part of the implementation phase, TLC introduced "THR3E"—three actionable steps designed for farmers in each sub-catchment to implement over three years. The TLC Farmer Toolbox was also launched, providing practical resources to help landowners make informed decisions and maximise the impact of their efforts. Additionally, monitoring strategies are to be implemented, and demonstration sites will be identified to help showcase best practices, ensuring that the plans remain relevant and actionable.





### 2. Tukituki's Overall Big Picture

#### 2.1. Summary of sub-catchment challenges and priorities

The Big Picture project team has worked with farmers to identify challenges and opportunities in each of the 17 sub-catchments. While each sub-catchment has an individual plan, it is the big picture of the people, the land and the water within the Tukituki that we are trying to collectively support. The approach is reminiscent of a jigsaw puzzle where many pieces fit together and form something greater than themselves as an individual piece. Figure 1 below shows how the Tukituki sub-catchments fit together as a big picture, showing the sub-catchments that are aligned in similar top priorities. Note that the image only shows the proposed highest recommended priority area for each sub-catchment, and all sub-catchments will have multiple outcomes they are seeking.





Figure 1 – Sub-catchment map for the Tukituki cathment. Coloured areas highlight the recommended priorities for each sub-catchment.

#### 2.2. Outcome areas most sought by farmers (from workshops)

During workshops, farmers were asked to vote on a selection of outcome areas. Below are the top five outcomes:

- Support landowners with the knowledge to make informed decisions to improve the environment
- Improve the flood resilience of the catchment, including upstream and downstream to reduce effects on community in adverse weather events
- Protect and enhance the economic viability of the area
- Protect and enhance the quality, ecology, mauri of waterways and wetlands
- Represent farmers interests in future regional government setting of rules and regulations



# MAKARORO SUB-CATCHMENT: CONTEXT AND CHALLENGES

#### 3. Sub-Catchment Context

#### 3.1. Background

The Makaroro sub-catchment, located in southern Hawke's Bay, plays a crucial role in local farming and water management. The Makaroro River originates from the Ruahine Range, flowing southeast before joining the Waipawa River near Tikokino. This river has been at the centre of discussions around water security, particularly with the proposed Ruataniwha Water Storage Scheme<sup>1</sup>. This project aimed to create a 93-million-cubic-metre reservoir to support irrigation and regional water supply. While the scheme was shelved, recent legislative changes may bring it back into discussion, potentially impacting water availability for farmers in the area.





Figure 1 - Location of the Makaroro sub-catchment in the wider Tukituki catchment

<sup>1</sup> Ruataniwha Water Storange Scheme Overview -

https://www.hbrc.govt.nz/assets/Document-Library/RWSS-Info-Sheets/Other-Info-Sheets/All-F actsheets-including-financials-Combined.pdf



#### 3.2. Sub-Catchment Context



Figure 3 – Tukituki sub-catchment areas in hectares.

The Makaroro sub-catchment is 12,197ha, 4.88% of the wider Tukituki catchment. The Makaroro is a moderate-sized sub-catchment of the Tukituki, which is 250,000ha (Figure 3).

Land use in the Makaroro is untypical of the wider Tukituki catchment with 69% of the sub-catchment in indigenous forest and 12% in pasture. Less than 6% of land cover is in exotic forest and either manuka or kanuka scrub (Figure 4).



Figure 4 – Land use in the Makaroro sub-catchment.



#### 3.3. Sub-Catchment Challenges and Key Focus Areas

Water quality in the Makaroro sub-catchment is generally good compared to other parts of the Tukituki catchment, benefiting from its headwater origins. Nutrient levels, including nitrogen and phosphorus, are relatively low, and E. coli levels are within acceptable limits. However, sediment levels can fluctuate, particularly during heavy rain, affecting water clarity downstream (table 1).

Table 1 - Makaroro sub-catchment water quality indicators over a five-year rolling average. \* The standard represents water quality levels based on the Tukituki plan or national standards. See link to the Makaroro dashboard<sup>2</sup> for more information.

Water Quality Parameter	Makaroro	Standard*
Nitrogen (DIN)	0.073 mg/ L	0.15
Phosphorus (DRP)	0.006mg/L	0.004
Bacteria (E.coli)	12.5 (count)	260
Freshwater invertebrates (MCI)	121.42 (index)	120
Sediment (Turbidity)	3.4 mg/ L	4.1FNU (light)

Despite the importance of these water quality and management issues, no catchment group has been established in the Makaroro area. Additionally, a recent planning discussion in December 2024 saw no community attendance.

<sup>&</sup>lt;sup>2</sup>https://www.hbrc.govt.nz/environment/farmers-hub/in-the-tukituki-catchment/tukituki-dashboard/mak aroro-dashboard



#### 3.4. Landscape Context

The Makaroro sub-catchment is different to many of the sub-catchments in the Tukituki catchment. It is one of the steepest sub-catchments, the most forested, the soil is different than the other sub-catchments and has the highest amount of indigenous forest (figures 5 to 8).



Figure 5 – Left: Geology of the Makaroro sub-catchment.

Figure 6 – Right: Soil orders of the Makaroro sub-catchment.



Land Use (LUCAS SubName) 2020 - Makaroro

Figure 7 – Left: Land use in the Makaroro sub-catchment(2020).

Figure 8 – Right: Estimated "appropriate" land use for the Makaroro sub-catchment(HBRC).

