Ūawa Catchment Working Group

Supplementary Report – Baseline and Reference States for the Ūawa Catchment

18 September 2024

1. Introduction

This report provides more information on the baseline and reference states for water quality in the Ūawa Catchment.

The Council has 2 water quality monitoring sites in the Ūawa catchment and a further 5 ecosystem health monitoring sites.

For these sites the Baseline Attribute State (NPSFM September 2017 benchmark requirement) and Reference State (what they might have been like prior to land clearance and modification) have been calculated.

A discussion on the implications for setting target attribute states follows each table.

2. Reference, Baseline and Current States

Nutrients

Site	Reference (original) State	Baseline State
Hikuwai River at Willowflat	Ammonia A Band Nitrate A Band Phosphate B Band	Ammonia B Band Nitrate A Band Phosphate B Band
Mangaheia River at Paroa Bridge	Ammonia A Band Nitrate A Band Phosphate B Band	Ammonia B Band Nitrate A Band Phosphate B Band

Discussion
These results indicate that in the main rivers nutrients are not a concern.

Tairāwhiti geology has a naturally high level of phosphorus which is why the reference state for both rivers shows them in the B band. This is important to understand when considering what level of improvement is actually possible. Phosphate is also normally attached to sediment and introduced into water from this mechanism.

Managing erosion and sediment generation can be one of the most effective ways to reduce phosphate. Because phosphate is so abundant in the Tairāwhiti – and Ūawa environment, if there are issues with periphyton and algal blooms due to nutrient levels manging nitrogen levels is likely to be the more effective action.

Ammonia is both a contaminant in its own right (from animal wastes and some types of fertilizer) and a breakdown product from nitrate when water temperatures are high. It is very toxic to fish even in small amounts. Ammonia levels in the Ūawa catchment are similar to other sheep and beef farming areas in Tairāwhiti.

Sediment

Site	Reference (original) State	Baseline State
Hikuwai River at Willowflat	Visual Clarity A Band	Visual Clarity D Band
Mangaheia River at Paroa Bridge	Visual Clarity A Band	Visual Clarity C Band

Discussion
Land clearance has irrevocably changed the Ūawa Catchment environment. While the original reference state would have been A band, this is unlikely to be something that can be aspired to within our lifetimes. Now that the land has been destabilised, restoring tree cover will help things but it won't be possible to return to the original state. The combined erosion processes also mean this will be a hard attribute to see improvements in the short term, and we need to be thinking about what might be longer term goals.

Bacteria

Site	Reference (original) State	Baseline State
Hikuwai River at Willowflat	E. coli A Band	E.coli C Band
Mangaheia River at Paroa Bridge	E. coli A Band	E.coli D Band

Discussion
One of th Ūawa catchment sites exhibits different trends to the rest of Tairāwhiti in relation to E.coli. Other parts of the region have seen a long term trend of improvement in E.coli levels but at the Mangaheia monitoring site we see a trend of degradation. It

may be worth doing some faecal source tracking work to confirm sources. A key question is whether this degradation is as a result of changed farming practice, or perhaps increased pest numbers in forestry catchments due to their stage in the harvest cycle.

Forestry is known to be the location of large numbers of deer and goats, and pest control is generally restricted to the time around and immediately following replant. In other catchments (eg Mōtū) pest animals have been identified as a significant source of E.coli, so it would be good to understand sources here, to inform what might be effective management methods.

Ecology

Site	Reference (original) State	Baseline State
Hikuwai River at Willowflat	MCI C Band	MCI D Band
Mangaheia River at Paroa Bridge	MCI C Band	MCI D Band
Hikuwai River at No 4 Bridge	MCI C Band	MCI D Band
Kaitawa Str at Wharf Rd	MCI C Band	MCI D Band
Karoronui Str at Anaura Bay Rd	MCI B Band	MCI C Band
Makokomuka Str at Waiapu Rd	MCI C Band	MCI C Band
Mangakino Str at Mangatokerau Rd	MCI B Band	MCI C Band
Waiau River at Tauwhareparae	MCI B Band	MCI C Band

Discussion

The reference state modelling for the larger rivers (Hikuwai, Mangaheia) and the Kaitawa Stream on the Tolaga Bay flats is identified as being in the C band. This is probably because they would have been relatively poorly shaded waterways in their natural state, with a larger proportion of soft sediments than the upper catchment.

In modern times these waterways will also be hard to see improvements in even the medium -long term. But measures such as riparian planting and reconnecting wetlands are likely to be the best kinds of measures in these areas to improve ecological health. The smaller, more elevated topgraphy waterways have reference (original) states in the B band – this is the norm across Tairāwhiti and reflects our soft geology. For example even Te Arai River at Waterworks Bush (original unmodified indigenous catchment and considered our main reference site) is in the B Band.

Research into the drivers of poor ecosystem health in Tairāwhiti Streams indicates that sediment levels are a major driver of poor ecological health. Alongside reducing

sedimentation, improvements in the riparian environment and reconnection/restoration of wetlands are the other main ways to improve ecosystem health.

3. Missing Attributes/Gaps in the Data

The information in this report only covers some of the water quality attributes we are required to set Baseline and Target Attribute States for in the catchment plan. Further monitoring is planned over the summer of 2024/2025 to try and fill some of the data gaps, so that we can identify baseline and current states for these attributes to inform catchment plans.

Particular areas where we need more information for the Ūawa Catchment Plan are:

- Periphyton
- Fish
- Deposited fine sediment
- Dissolved oxygen
- All attributes - small coastal catchments – only 1 ecological monitoring site is located in this area
- All attributes Maungahauini FMU.