Ūawa Catchment Working Group

State of Environment – Baseline Attribute States and Target Attribute States

15 October 2024

1. Introduction

The first part of developing a catchment plan under the NPSFM is identifying the vision, values and environmental outcomes for the catchment. Once these are established then we can consider how well the catchment water quality and quantity meet those environmental outcomes – and what action might need to be taken to either maintain the values, or to improve the situation where environmental outcomes are not being met.

This report updates the information provided to the roopu at Hui 4. Where there is a change this is highlighted in green.

2. State of Environment

At Hui 1 a summary report was provided that outlines the state of environment as understood by the Council, based on its water monitoring programme.

This compares the water quality to the National Objectives Framework of the government. Under this framework, sites can be rated as A, B, C, D or E band. There is a National Bottom Line that sites must meet, or action taken by the Council to improve water quality.

Key takeouts from that report are that for the period 2017- 2022:

- **Aquatic ecosystem health** across all monitored sites is poor and fall below national bottom lines
- **Periphyton** (algae) levels are below the national bottom line at the Mangaheia River monitoring site
- **Nutrient** levels are generally good – with long term improving trends
- **Dissolved oxygen** levels are poor at monitored sites – this is probably because of the lack of shading and low water levels
- **E.coli** levels are variable. Ūawa River is only safe for swimming 81% of the time, and the Mangahauini River and Anaura Bay Lagoon North is safe for swimming only 48% of the time and Waiotu Stream at Tokomaru Bay is only safe for swimming 41% of the time. Anaura Bay Lagoon South is safe for swimming 98%

of the time. Alongside this the Hikuwai and Mangaheia Rivers have poor (C Band) E.coli levels and the Mangaheia River is getting worse.

- **Suspended sediment** levels are poor – and below the national bottom line at the Hikuwai River, deposited fine sediment is below the national bottom line at all 5 sites that are monitored.

3. Baseline Attribute States

The NPSFM requires that water quality is not allowed to degrade from the Baseline Attribute State. This is set as being the water quality for each attribute, as of September 2017.

Key attributes for which the baseline attribute states (BAS) have been calculated are outlined in the tables below. Alongside this a Reference State (based on modelling) is provided. This gives an indication of what we could expect if the catchment was fully returned to native vegetation. This information will help us in understanding what might be possible in terms of improvement.

Nutrients

Council Monitoring Site	**Baseline Attribute State – Sept 2017**	**Reference State (modelled if catchment fully revegetated with natives)**
Hikuwai River at Willowflat	Ammonia B Band Nitrate A Band Phosphate B Band	Ammonia A Band Nitrate A Band Phosphate B Band
Mangaheia River at Paroa Bridge	Ammonia B Band Nitrate A Band Phosphate B Band	Ammonia A 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 shading levels over the waterbody is likely to be more effective than trying to reduce nutrients.

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

Council Monitoring Site	Baseline State	Reference State (modelled if catchment fully revegetated with natives)
Hikuwai River at Willowflat	Visual Clarity D Band	Visual Clarity A Band
Mangaheia River at Paroa Bridge	Visual Clarity C Band	Visual Clarity A Band

Discussion

Land clearance has changed the Ūawa Catchment environment and caused massive sedimentation. Revegetation and stabilising the eroding lands is a main method that could be used to imrpve the visual clarity of the water – which is important for aquatic life (so they can see their food – and breathe) and for recreation. However getting to the A band is unlikely to be something that can be aspired to within our lifetimes. 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

Council Monitoring Site	Baseline State	Reference State (modelled if catchment fully revegetated with natives)
Hikuwai River at Willowflat	E.coli C Band	E. coli A Band
Mangaheia River at Paroa Bridge	E.coli D Band	E. coli A Band

Discussion

One of the Ūawa catchment monitoring 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 source of E.coli, so it would be good to understand sources here, to inform what might be effective management methods.

Ecology

Council Monitoring Site	Baseline State	Reference State (modelled if catchment fully revegetated with natives)

Hikuwai River at Willowflat	MCI D Band	MCI C Band
Mangaheia River at Paroa Bridge	MCI D Band	MCI C Band
Hikuwai River at No 4 Bridge	MCI D Band	MCI C Band
Kaitawa Str at Wharf Rd	MCI D Band	MCI C Band
Karoronui Str at Anaura Bay Rd	MCI C Band	MCI B Band
Makokomuka Str at Waiapu Rd	MCI C Band	MCI C Band
Mangakino Str at Mangatokerau Rd	MCI C Band	MCI B Band
Waiau River at Tauwhareparae	MCI C Band	MCI B 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 reflects the massive changes that have occurred in the form and nature of these waterways since deforestation.

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.

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 in the small coastal catchments – only 1 ecological monitoring site is located in this area
- All attributes in the Maungahauini FMU.

4. Target Attribute States

A key component of the Catchment Plan is the identification of target attribute states (TAS) and the timeframes to achieve them. For many parts of the catchment, current water quality does not support the values or environmental outcomes sought. However, improving water quality is not a fast or easy process. The target attribute states need to take the catchment towards those environmental outcomes and the NPS-FM directs that these need to be both realistic but also ambitious.

The following approach is proposed in drafting the proposed target attribute states:

- Where the water quality attribute is within the A or B band, the target should generally be to maintain the current state. This recognises that that water quality attribute is not likely to be a major contributor to not achieving environmental outcomes.
- Where the water quality attribute is currently degrading, and/or below the national bottom line and/or at a level where it is impacting on the values of the waterbody, targets should be set.
- It needs to be recognised that water quality problems are difficult and slow to address. Targets need to be ambitious but realistic.
- For degrading attributes it is proposed that the first five-year target would focus on stabilising water quality and halting the declining trend. The second five-year target would be to reverse the degrading trend and the longer-term target (15-30 years) is to reach the national bottom line (NBL) or the next band.
- Depending on how bad things are, for attributes below the national bottom line or where values are not being met, interim targets could be to improve within a band, with longer term (15-30 year) targets to meet national bottom lines or the next band.
- The implications of this approach are summarised in the table below:

Site	Attribute	Target Attribute State Proposed
Hikuwai Bridge at Willowflat	Deposited Sediment	Aim to meet National Bottom Line within 20 years
	Macroinvertebrates	Aim to meet National Bottom Line within 20 years
	Dissolved oxygen	Move to top of C band within 10 years
	E.coli	Reach levels that are safe for boating and some types of Mahinga Kai during summer within 10 years and safe for swimming and all Mahinga Kai within 20 years

	Visual Clarity/Suspended	Aim to meet National Bottom Line within 10 years
Mangaheia River at Paroa Road Bridge	Deposited Sediment	Aim to meet National Bottom Line within 20 years
	Macroinvertebrates	Aim to meet National Bottom Line within 20 years
	Dissolved oxygen	Move to top of C band within 10 years
	E.coli	Halt degrading trend within 5 years. Reach levels that are safe for boating during summer within 10 years and safe for swimming within 20 years
	Periphyton	Aim to meet National Bottom Line within 10 years
	Visual Clarity/Suspended Sediment	Move to top of C band within 10 years
Makokomuka Stream at Waiapu Road	Deposited Sediment	Aim to meet National Bottom Line within 20 years
Hikuwai River at No. 4 Bridge	Macroinvertebrates	Aim to meet National Bottom Line within 20 years
Waiau River at Tauwhareparae	Macroinvertebrates	Aim to meet National Bottom Line within 10 years
Mangakino Stream at Mangatokerau Road	Deposited Sediment	Aim to meet National Bottom Line within 20 years
	Macroinvertebrates	Aim to meet National Bottom Line within 20 years
Kaitawa Stream at Wharf Road	Deposited Sediment	Aim to meet National Bottom Line within 20 years
	Macroinvertebrates	Aim to meet National Bottom Line within 20 years

Questions
Do you agree with the proposed approach to setting targets? What should change? Are there some things which should be prioritised?

Key Definitions Used in this Report

Attribute: A measurable indicator of water quality

- chemical e.g. nitrate levels (mg/L)
- biological e.g. Macroinvertebrate index (MCI)
- Physical e.g. visual clarity (metres)

Baseline Attribute State: What an attribute was like on 7 September 2017 – but for some attributes the date is when we notified the operative Waipaoa Catchment Plan - August 2015. Measured at specified monitoring sites.

Target Attribute State: What we want that attribute to be like to achieve the environmental outcomes.

Interim Targets: 10-year milestones on the path to the Target Attribute State.