Te Kōrero o te whakahaere i ngā kāhui wai māori o te awa o Tarawera

The Tarawera River Freshwater Management Unit Story

The purpose of this booklet is to explain draft options to address requirements of the National Policy Statement for Freshwater Management 2020 (NPSFM) in the Draft Tarawera River Freshwater Management Unit (FMU). These options are to do with how we manage freshwater in Tarawera River to achieve outcomes the community wants there.

This booklet covers:

- A description of the draft FMU
- Freshwater management issues in this FMU
- Options for:
  - **A.** A long-term vision for freshwater;
  - **B.** Proposed outcomes for key freshwater values;
  - **C.** Water quality, ecosystem health and other issues and targets;
  - **D.** Water take limits and minimum flows; and
  - **E.** The kinds of rules and other methods being considered to achieve these things.

We are early in the policy development process and are seeking feedback from the community to help inform the important decisions.

Your feedback to the questions inside this booklet can be provided in writing on the corresponding question sheet, online via our website or in person at one of our community events.

TOI MOANA
BAY OF PLENTY
REGIONAL COUNCIL

Ko te wai te oranga o ngā mea katoa

Water is the life-giver and essence of all things

Ngā tohu

This design represents the multiple waterways and waterbodies such as streams, rivers, lakes, and sea. The overall flowing form represents a river/tributary carving its way through the whenua. The koru has been included to represent the life force that water embodies and gives. Haehae represent whakapapa, including the past, present and future. It is a visual celebration of water as a life-giver and the essence of all things.

Te Wairere represents a waterfall with huka (foam) the dynamic movement of the water and the connections between different tributaries as they flow from the land to the sea, mai i te whenua, ki te moana.

Te Mana o te Wai - Tirohanga whānui

Essential Freshwater - Overview

In 2020, the New Zealand Government released the National Policy Statement for Freshwater Management (NPSFM) which outlines the direction all regional councils must take in the management of freshwater. As a result, the Bay of Plenty Regional Council now needs to change its Regional Policy Statement (RPS) and Regional Natural Resources Plan (Regional Plan). This means changing some of the policies and rules we use to manage how freshwater and land is used.

Between April 2023 and September 2023 we will ask you about your aspirations for your local waterways and your feedback on our draft change options. Your elected regional councillors will then consider and decide on options.

By the end of 2024 we will notify formal proposed changes to policies and rules. Everybody will be able to make submissions and be heard by a freshwater hearings panel.

Draft change options	Community engagement	Amend options	Councillors decide	Notify propsed RPS and RNRP change	Public submissions	Hearings
2022 - 2023	*April - Sept 2023*	*Late 2023*	*Late 2024*	*Late 2024*	*2025*	*Late 2025 - 2026*

We acknowledge there are already a lot of other changes happening due to a host of new national regulations and proposed new laws, and this is yet more. Nevertheless, we encourage your involvement because many of the proposals discussed are specific to this FMU and we need you, the community, to help work through and identify solutions that will work for us all.

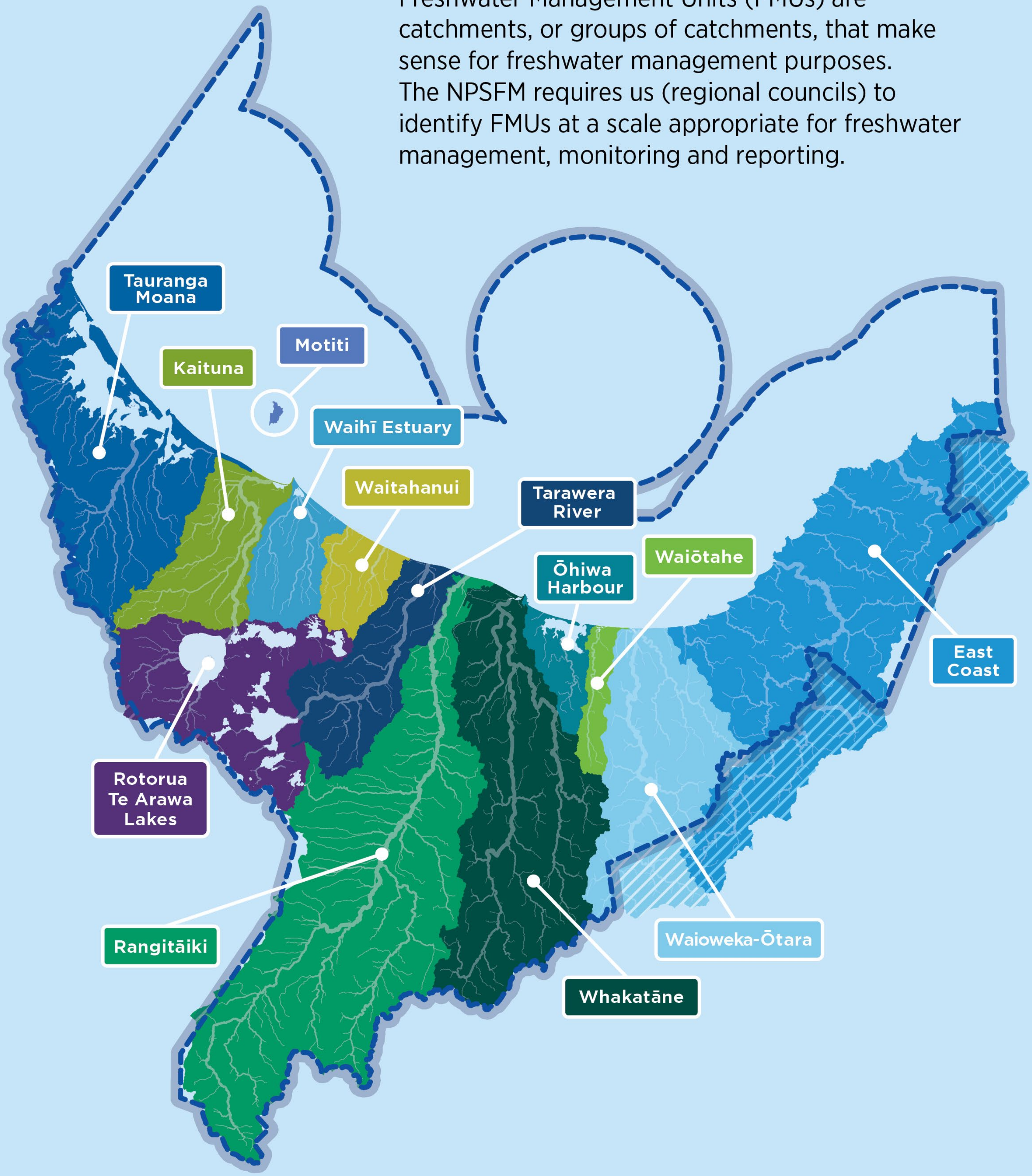
For more info

- Head to **boprc.govt.nz/freshwater**
- Read our Region Wide Overview booklet
- Sign up to receive our Freshwater Flash e-newsletter at **boprc.govt.nz/newsletters**
- Follow our social media
- Visit **participate.boprc.govt.nz**

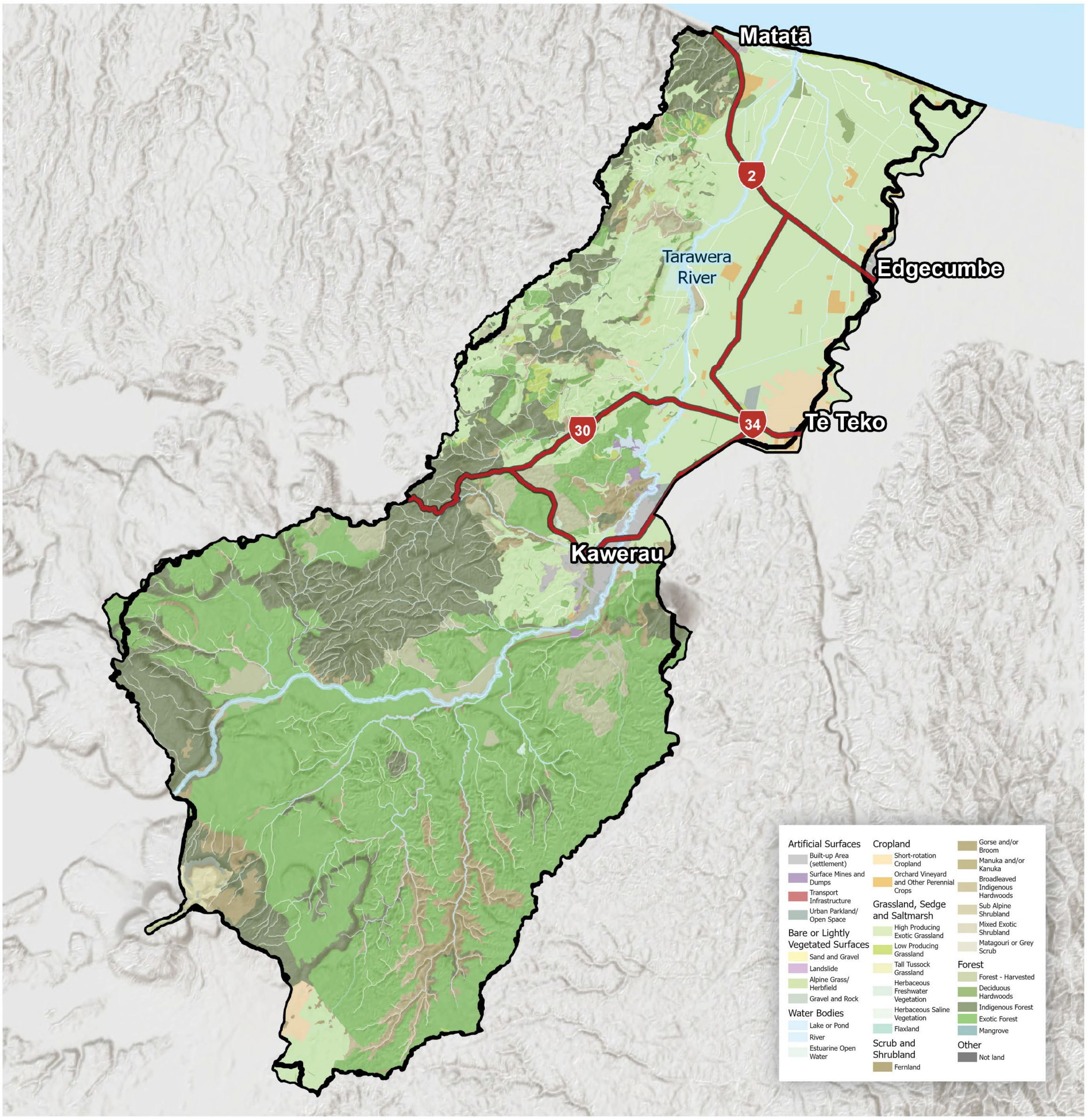
Ngā tauira o ngā rōpū whakahaere o te wai māori

Draft Freshwater Management Units

Freshwater Management Units (FMUs) are catchments, or groups of catchments, that make sense for freshwater management purposes. The NPSFM requires us (regional councils) to identify FMUs at a scale appropriate for freshwater management, monitoring and reporting.



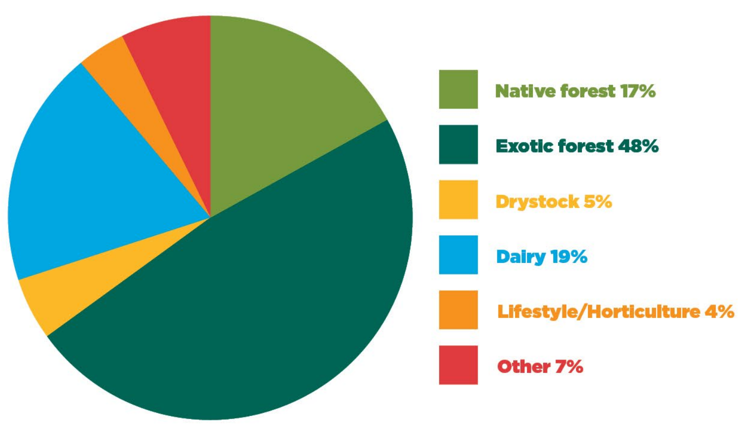
We are proposing 13 Draft FMUs in our region, based on surface water catchments (or groups of these with similarities) and whether they feed into lakes, estuaries, or the ocean. Each Draft FMU has special characteristics (e.g., water body, cultural, community, geology, landform, land use and economic characteristics) that make it unique. Each will have its own chapter in the Regional Plan. The Regional Plan will have region wide rules but may also have rules specific to each FMU. The rules in FMUs may vary depending on the issues faced in that FMU.



Tarawera - FMU Map

Land area:
66,000 ha

Population:
10,900 people



Mō te Tauira o te whakahaere i ngā kāhui wai māori o te awa o Tarawera

About the Draft Tarawera River Freshwater Management Unit (FMU)

The Draft Tarawera River FMU follows the river catchment, which covers an area of 66,000 ha. The Tarawera River starts at the Lake Tarawera outlet, where it flows underground briefly and surfaces at the Tarawera Falls. From Kawerau, the Tarawera River flows through the western side of the Rangitāiki Plains, which rely on the Rangitāiki Land Drainage Scheme to enable agriculture. There are several significant wetlands in these lowlands. Water from Mount Tarawera and Pūtauaki, and geothermal water from Mangakotukutuku and Waiaute Streams feed into the Tarawera River as it flows to the coast near Matatā.

This draft FMU contains the Karaponga Hydro Electric Power Scheme on the Karaponga Stream.

There are substantial industrial activities, with associated takes and discharges in this FMU, including the Tasman Mill and the wider Kawerau Industrial Estate.

The Tarawera Catchment Regional Plan 2004 was developed specifically for the Tarawera Catchment, with a strong focus on improving water quality from industrial discharges.

Question 1 Do you think we have got this draft FMU boundary about right?

Tangata whenua

- There are significant whakapapa, cultural and historical connections and responsibilities for tangata whenua within this FMU. These include those associated with Tuhourangi, Ngāti Rangitihi, Ngāti Awa, Ngāti Tūwharetoa (Bay of Plenty), Ngāti Pikiao, Ngāi Tūhoe, Ngāti Mākino, Ngāti Tarāwhai. Māori communities are based around hapū and marae and are very closely connected through whakapapa.
- The Ngāti Rangitihi Claims Settlement Act 2022 established the Tarawera Awa Restoration Strategy Group consisting of eight members from Te Mana o Ngāti Rangitihi Trust, Ngāti Mākino Iwi Authority, Te Rūnanga o Ngāti Awa and Ngāti Tūwharetoa Bay of Plenty Settlement Trust, the Bay of Plenty Regional Council, Kawerau District Council, Rotorua Lakes Council and the Whakatāne District Council. The purpose of the Strategy Group is to support, co-ordinate, and promote the integrated restoration of the mauri of the catchment.
- Ngāti Rangitihi, Ngāti Tūwharetoa (Bay of Plenty), Ngāti Awa and Affiliate Te Arawa Iwi/Hapu have statutory acknowledgements relating to the Tarawera River.
- About 18% of the FMU land area, or about 12,000 ha, is Māori-owned land[1]. Land use of Māori-owned land is dominated by exotic (36%) and native (31%) forestry, followed by dairy (16%), drystock (10%) and a range of other land uses (7%).

[1] Māori-owned land being land subject to the Te Ture Whenua Māori Act 1993 or settlement land returned as licensed land, commercial redress, or cultural vesting.

Communities

- As of June 2022, the population of the Draft FMU was estimated to be 10,900 people, concentrated mainly in Kawerau and the coastal plains (e.g., Matatā).
- Community feedback so far has told us that human contact, ecosystem health, fishing, natural character and mahinga kai are important freshwater values in this Draft FMU. Braemar Springs and the Tarawera River are highly valued for recreational use and Kawerau has a purpose made whitewater slalom course which hosted the 2013 World Rafting Champs. Most respondents were very happy with the recreational values of the water.
- Submitters sought improvements to water quality, a reduction in extraction, and protection of the unique ecosystem and abundant taonga species around Braemar Springs, while still providing for the public to enjoy it.

Land and land use

- 65% of the catchment is in forest land cover (including 17% native forest and 48% plantation forest), mostly in the upper catchment and along the eastern side of the river. 19% is in dairy, 5% in drystock and 4% lifestyle and horticulture. Horticultural expansion has occurred in recent years. Soils in the upper catchment are generally erodible, well drained pumice, whereas in the lowland plains are poorly draining gley/peat soils (i.e., drained wetland soils, with high organic matter content prone to shrinkage when dried/drained).
- Agriculture in the Kawerau District is estimated to contribute $4 million to the Bay of Plenty's regional GDP in 2020/21. The FMU also contributes towards the Whakatāne District figures along with the Rangitāiki, Whakatāne and Ōhiwa Harbour FMUs. Dairy farming and drystock farming in the Whakātane District are estimated to contribute $120 million and $14 million respectively. Horticulture and other crops are estimated to contribute $28 million.
- Pulp, paper, and wood product manufacturing in the Kawerau District are estimated to contribute $149 million to the Bay of Plenty's regional GDP in 2020/21.

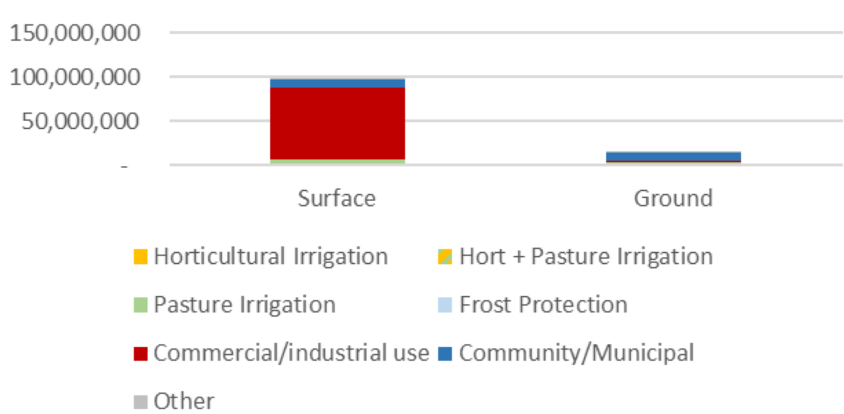
Rivers, streams, and wetlands

- This FMU includes the Tarawera River, and its tributaries and wetlands.
- In the lower reaches, the Tarawera River was diverted from its original course to discharge directly to the sea. In the early 1900s a large network of canals and drains were constructed to drain the extensive former wetlands and create Rangitāiki Plains to enable agriculture – now managed as the Rangitāiki Land Drainage Scheme. Today, much of the Rangitāiki Plains area is actively pumped to protect rural settlements, production, and infrastructure. Some canals cut cross the draft FMU boundary with the draft Rangitāiki FMU, including Reids Canal, and Old Rangitāiki River Channel that formerly connected the Tarawera and Rangitāiki River (disconnected around 1914). The Tarawera River Flood Protection Scheme also operates to protect Kawerau and the lowlands.
- There are 575 ha of wetland in the FMU (9% of the historical extent). Substantial natural wetlands in the lowlands are Lake Popowharau, Tahuna-Putanaki, Lake Tamurenui, Tumurau Lagoon, Awakaponga Wetlands, Awakaponga Stream, Awaiti Wetlands, Bregman's Lagoon, Tarawera Cut, Matatā Lagoon, Matuku wetlands, Kawerau Road wetland, Lake Tahana, Lake Rotoitipaku, Mangaone Two, Mangaone Lake, Matatā dump and Lake Rotoroa. Some have become perched above surrounding land that has compacted, and water levels now need to be actively managed to maintain the wetlands.

- Tarawera FMU provides important habitats for 17 freshwater related threatened species (including fish, birds, plants and other animals). Tarawera is known to contain the threatened fish species, pīharau, or lamprey. Eight areas are identified for their significant coastal biodiversity. Twenty-two priority biodiversity sites involve a water body within this FMU.
- The Tarawera Falls are a unique feature where water surges out of fissures in a high cliff face.
- Fish & Game have identified the Tarawera and some of its tributaries as significant adult trout and spawning locations. Community feedback also identified the Tarawera River in Kawerau as a popular fishing location.

Water use, takes and discharges

- Water is used for a variety of purposes. It is used for a range of cultural purposes (such as karakia, iriiri, whakanoa), recreational purposes (such as fishing), mahinga kai and for food production (such as for horticultural irrigation, frost protection and stock watering).
- As of January 2022, there were 82 water take consents in the Draft FMU (37 surface water and 45 groundwater). The majority of consents are for dairy farming and horticulture (irrigation and frost protection). However, the consented volume is dominated by commercial and industrial purposes, particularly consents associated with the large industrial estate in Kawerau. These larger takes are often non-consumptive, meaning the water is returned back to the river further downstream as treated wastewater.
- Pumphouse Spring, Holland Spring and Braemar Spring are used for municipal supply of Te Teko, surrounding plains community and Kawerau.
- There are 34 discharge consents to land, including Kawerau treated wastewater and stormwater and Edgecumbe stormwater, nine on-site effluent treatment discharge consents and 40 discharge consents to water.
- There are several major point source discharges. These include the discharge of geothermal fluid, and wastewater discharges from the industrial estate in Kawerau (including Tasman Mill) into the Tarawera River. The Edgecumbe wastewater treatment plant discharges into the Omeheu Canal before joining the Tarawera River. Kawerau treated wastewater discharges to land.
- This FMU contains the Karaponga Hydroelectric Power Scheme on the Karaponga Stream. Hydroelectric generation in the Whakatāne District is estimated to contribute $25 million to the Bay of Plenty's regional GDP in 2020/21. The Karaponga scheme contributes towards the Whakatāne District figures along with the HEP schemes located in the Rangitāiki FMU.



Tarawera River FMU Resource Consents to take water – volume m³/year

What is likely to happen with climate change over the medium to long term (mid-late century)?

- Average annual rainfall totals are not expected to change significantly in the period to 2040, although the pattern changes, with less in the spring/summer months. In lake fed catchments such as the Tarawera, changes to low flow are likely to be subdued, although increases in evaporation (from land or water) and transpiration (from plants) may result in increased demand.
- More frequent extreme rainfall events may result in higher flood flows in summer and winter, and sediment loss from erosion may get a lot worse.
- Land on the lowland plains nearest the coast may become increasingly affected by salinity and wetness, and gradually inundated by the sea, or by higher river levels. Some land use may become less viable or unviable by mid–late century.

Question 2 Does this brief summary about the people, land and water in this FMU seem right to you?

He aha tōu kitenga mō te anamata o te wai māori?

What is your vision for the future of freshwater?

Draft long-term vision for freshwater

A key part of freshwater planning is being clear about what you seek to achieve. A long-term vision for freshwater is required by the NPSFM and must set out what tangata whenua and the community collectively want to see for freshwater in the FMU. Visions should be ambitious but reasonable.

We've drafted some options based on issues and what we've heard from tangata whenua and communities so far. Note any long-term vision for the Tarawera FMU may need to be updated or replaced in response to the vision that will be prepared by the Tarawera Awa Restoration Strategy Group established under the Ngāti Rangitihi Claims Settlement Act 2022.

Option A Restore the mauri and enhance surface water quality, quantity and habitat in the Tarawera Catchment to a level which safeguards the life supporting capacity of the water and meets the reasonable needs of people and communities.

1. The industrial estate will aim for continuous improvement in discharges resulting in a reduction in contaminants into the lower Tarawera River.
2. Innovative and sustainable land and water management practices support food production, and drainage so that waterways are safe for human contact, mahinga kai thrives and the ecosystem health is enhanced.
3. Pasture affected by salinity and a rising watertable will be reverted to a sustainable landuse such as saltmarsh.

This vision is to be achieved by 2050.

Option B Restore the mauri of the Tarawera River Catchment. Within the Tarawera FMU:

1. Protect and restore aquatic ecosystems and habitats.
2. Enhance surface water quality in the Tarawera Catchment to a level which safeguards the life supporting capacity of the water and meets the reasonable needs of people and communities.
3. In the lower Tarawera the quality, levels and flow of streams, rivers, lakes, wetlands, springs and groundwater are restored, maintained and protected for their mauri, freshwater ecosystems, habitats, fisheries and customary resources, and future generations at a rate that enable communities and industry to adjust.

The vision is to be achieved by 2050.

Question 3 As a draft vision do you prefer Option A or B?

Draft values and environmental outcomes

The NPSFM uses the term “values” to refer to important aspects of freshwater. We must manage freshwater to protect compulsory freshwater values and must also consider other values if present. We must set environmental outcomes for these values.

We have used iwi and community feedback as well as our own research to identify the values we think matter most in this draft FMU. Restoring the mauri, especially of the lower reach of the Tarawera River is a priority for Iwi. This includes ensuring sufficient habitat for fish, tuna (eels), kākahi, whitebait, kōura and watercress, so that these taonga species are abundant and safe to eat. Other outcomes include enjoying the recreational values of the water including Sandy Bay in Kawerau, the Tarawera River, Braemar Springs (Te Waiū o Pukemaire) and the Kawerau Kayak Course.

Freshwater in this FMU supports marae and households, provides drinking water for animals, supports irrigation and food production, and is an important component of industry.

The following table contains some draft outcome statements, based on what we have heard so far.

Freshwater Values *The ways fresh water is important* *Shaded values are compulsory national values in the NPSFM*	**DRAFT Environmental outcome** *How we would like the values to be*
Ecosystem health	Enhance water quality in the Tarawera River FMU to a level which safeguards the life supporting capacity of the water and meets the reasonable needs of people and communities. Maintain water levels and flows to sustain fish, customary resources, natural character, wetlands and the groundwater resource and provide for cultural values. Protection, maintenance and enhancement of the indigenous vegetation, habitat and migration pathways of fish and birds that live in the remnant wetlands, lakes, rivers and their margins in the Tarawera River Catchment. The diversity and abundance of birds and other fauna is maintained or improved, and aquatic pest species are controlled.
Human contact	Water quality is maintained or improved to be suitable for swimming with a low risk of getting sick. Maintain river flows sufficient for a variety of recreational activities.
Threatened species	Protect critical habitat to support the presence, abundance, survival, and recovery of threatened species.
Mahinga kai	The mauri of fresh water provides for the cultural health of taonga species and the continuation of mahinga kai practices and associated tikanga. Fish, tuna (eels), kākahi, whitebait, kōura and watercress are abundant and safe to eat. Restore, maintain and protect the mauri of freshwater resources.
Natural form and character	Enhance and protect the natural character and

Freshwater Values *The ways fresh water is important* *Shaded values are compulsory national values in the NPSFM*	**DRAFT Environmental outcome** *How we would like the values to be*
	life-supporting capacity of remaining wetlands on the Rangitāiki Plains.
Drinking water supply	People have sufficient, reliable, and safe water for drinking and reasonable domestic use, to the extent possible and subject to providing for the outcomes shaded above.
Wai tapu	Waahi tapu, sites of cultural significance, wai tapu and the tikanga associated with these sites and waters are protected and maintained.
Transport and tauranga waka	Maintain and enhance public access to and along rivers while ensuring that threats to natural heritage, safety and security values caused by public access are minimised.
Fishing	Maintain fish spawning water quality in the upper Tarawera River and improve water quality and habitat in the lower Tarawera River and its tributaries.
Hydroelectric power generation	Water quality and quantity is sufficient to provide for hydroelectric power generation to be maintained, to the extent possible and subject to providing for the outcomes shaded above.
Animal drinking water	Farmed animals have sufficient, reliable, safe, and palatable drinking water, to the extent possible and subject to providing for the outcomes shaded above.
Irrigation, cultivation, and production of food and beverages	Reasonable and efficient irrigation and food processing freshwater needs are provided for with an adequate level of reliability, to the extent possible and subject to providing for the outcomes shaded above.
Commercial and industrial use	Reasonable and efficient commercial and industrial freshwater needs are provided for with an adequate level of reliability, to the extent possible and subject to providing for the outcomes shaded above.

Question 4 What do you think of the draft values and outcomes identified for this FMU?

Te kounga o te wai me te oranga o te pūnahi hauropi

Water quality and ecosystem health

The vision, values and outcomes give a sense of where we want to be. How hard it is to get there depends very much on where we are right now. The things we do on the land can affect river, stream, wetland and estuary health. We measure lots of different things to check the health of the environment- these are called attributes. The state given below is what it was like in September 2017 – called baseline state as defined in the NPSFM. The NPSFM has a grading system for each attribute. The grades are A-D bands. A band = very good state, D = poor state. The trend tells us whether it is getting better or worse over time.

River and stream water quality for ecosystem health

The main water quality attributes we measure in rivers and streams are the contaminants of concern for most areas, the nutrients nitrogen and phosphorus, and sediment. Find out more about how we monitor river health, here.

Bay of Plenty Regional Council has two long term monitoring sites in this FMU to measure state and trends in river and stream water quality. Both of these sites are on the main stem of the Tarawera River. There is also a site at the lake outlet, but that is more reflective of water quality in the Rotorua lakes FMU, so grouped with that FMU in most reports. In areas where we don't have enough monitoring data, river health has been estimated by an Expert Panel using the best information available from throughout the region. This gives us an indication of the water quality state and helps us identify where changes may be needed to meet environmental outcomes. The NPSFM requires us to take action and make improvements if water quality is below a national bottom line or is degrading (shows a worsening trend over time), unless this is due to natural causes.

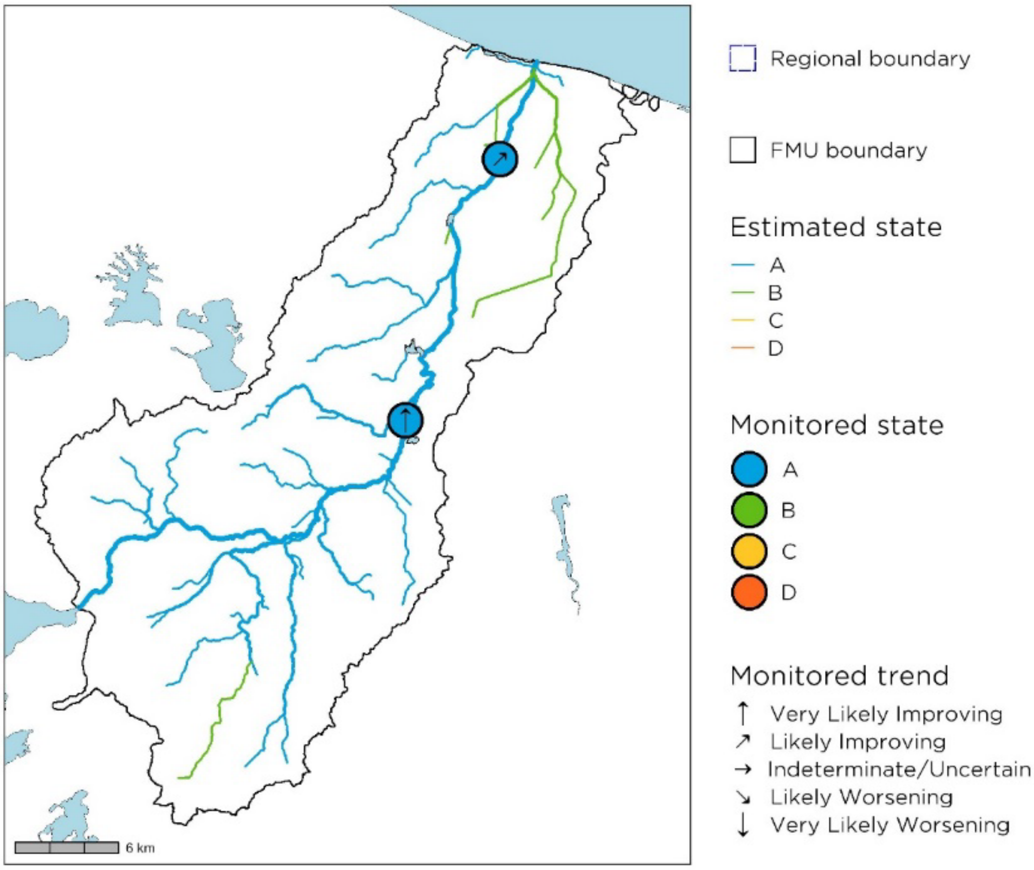
Measured nitrogen concentrations are well below levels that can have toxic effects, in the A band, and are showing improving trends. Nutrients like nitrogen and phosphorous can promote plant, weed and algal growth in rivers, streams and estuaries.

Measured dissolved reactive phosphorus concentrations are high (in the D band) at both sites, do not meet national bottom lines, and are showing worsening trends. The high phosphorus is likely from the volcanic influence in the area, although human activity, including wastewater discharges from the Tasman Mill, are adding to this.

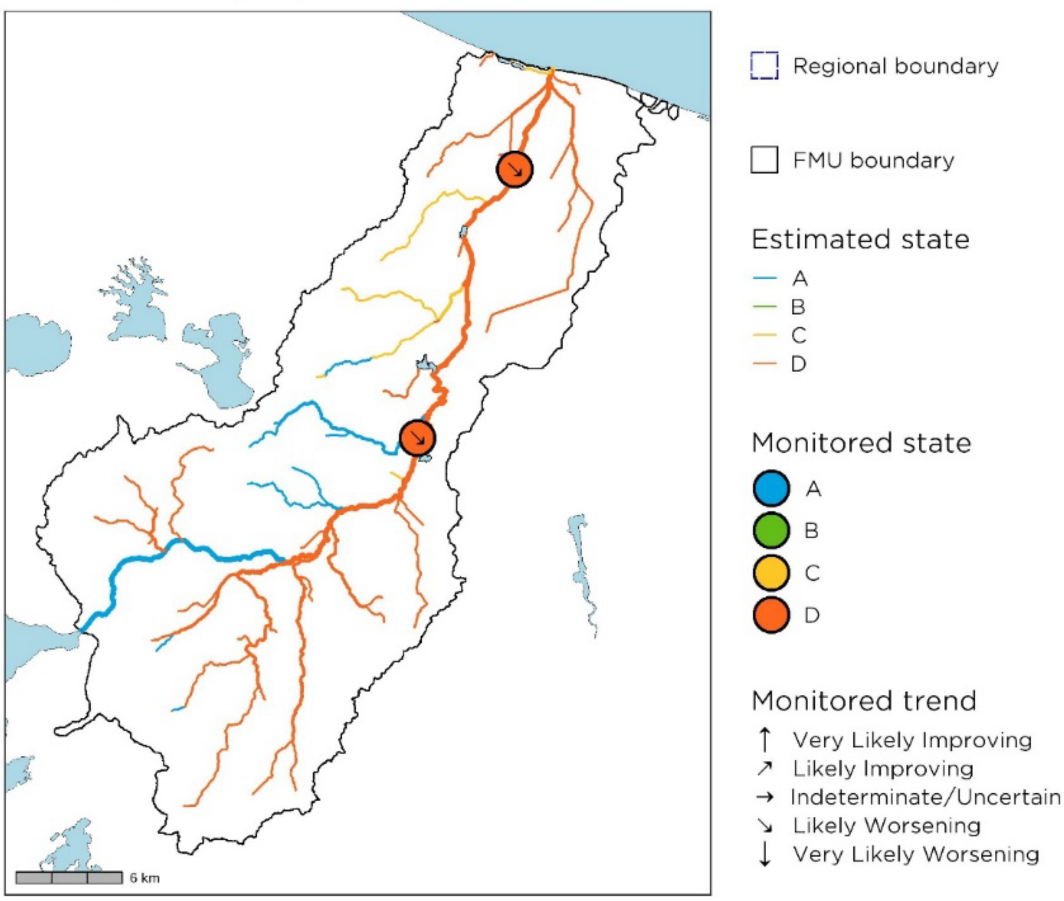
Suspended fine sediment (measured by way of water clarity) is in the C band at the Kawerau Bridge site and below the national bottom line at the Awakaponga site downstream. The poor water clarity below Kawerau is linked to the colour in the Tasman Mill wastewater discharge, and complicated by geothermal (both natural and industrial) and wetland inputs as well as actual sediment run off from pasture in the lower catchment. Improvements in colour and clarity have been linked to reduction in colour from the mill.

In addition to these monitored sites, some surveys of lowland drainage canals show quite poor water quality.

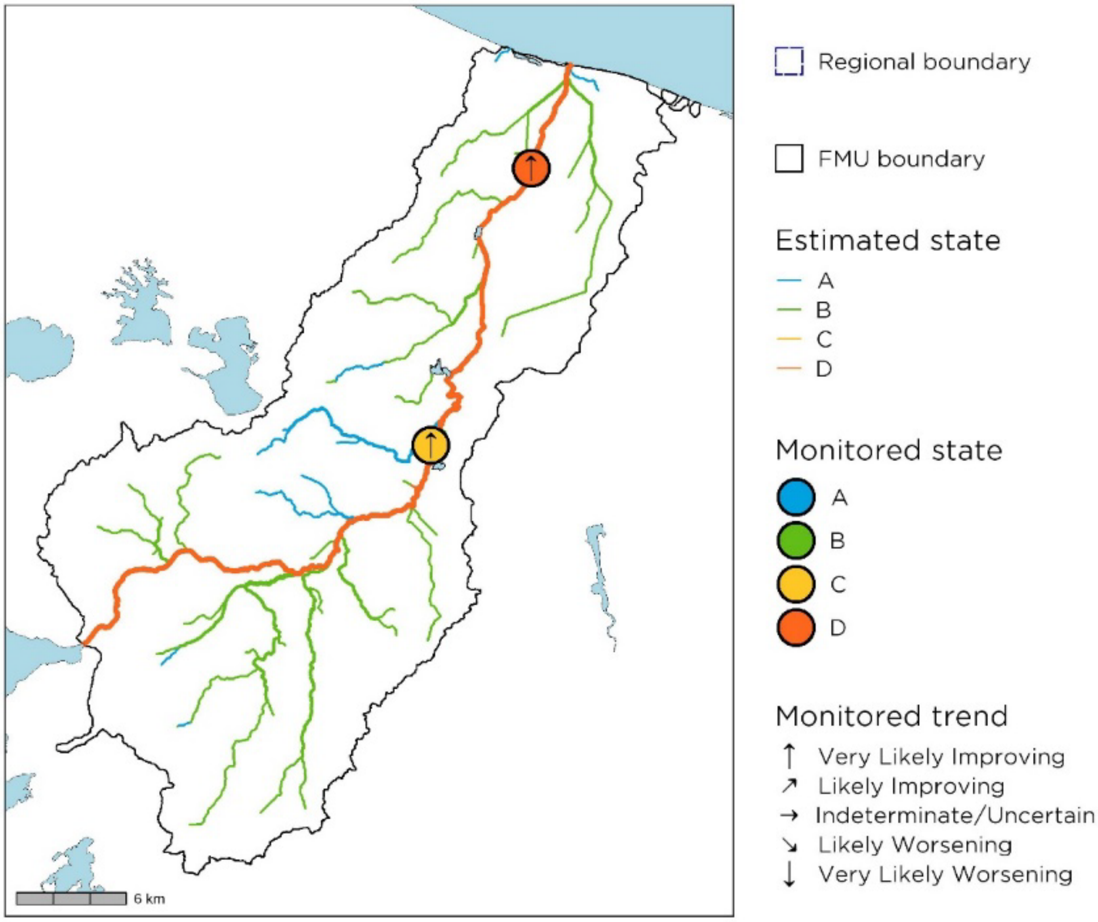
Nitrate (toxicity)



Dissolved reactive phosphorus



Suspended fine sediment



River and stream aquatic life for ecosystem health

The main aquatic life attributes we measure are fish, macroinvertebrates which include worms, snails and insects, both in their immature larval phase, and as adults (e.g., mayflies, caddisflies, beetles), and periphyton - algae and fungi that grow on the beds of our rivers, lakes and streams and can make it slippery and slimy. For ease of interpretation, invertebrate data is simplified as special indices such as the Macroinvertebrate Community Index (MCI). The Macroinvertebrate Community Index (MCI) is based on the tolerance or sensitivity of species to organic pollution and measures the presence (or absence) of invertebrates. Higher MCI scores indicate better stream conditions at the monitoring site. Two other indices are also used to describe macroinvertebrate health – the quantitative MCI and Average Score Per Metric; check out our Water Ecology Tool for more information.

Fish surveys show 18 fish species recorded in this FMU; 15 of these are native. Longfin and shortfin eels, rainbow trout, common and bluegill bullies, inanga, torrentfish and banded kōkopu were the most common. There are also records of threatened fish species like pīharau (lamprey) and shortjaw kōkopu. All of the native fish species present are migratory, meaning any barriers could have a large effect on fish. This is particularly relevant in the lower parts of the FMU where pump stations and floodgates are present. These may prevent upstream movement of fish such as banded kōkopu, inanga and eels into some areas, and will likely affect the ability for them to migrate back to sea. The mouth of the river is known to support a popular whitebait fishery.

The Council has 12 macroinvertebrate monitoring sites in the Tarawera FMU to measure state and trends in river health. The majority of sites are in the B and C bands, with some, especially in the lower Rangitāiki plains, in a poorer condition (D band). The poor ecological condition in lowland drains reflects a combination of the lack of habitat features such as rough stream beds and banks, meandering channels, and overhead vegetation, as well as the poor water quality.

Plant, weed and algal growth in rivers and streams is generally not an issue in the Tarawera FMU as mobile pumice beds are unsuitable habitat for significant periphyton biomass to develop.

Human contact

Elevated levels of faecal bacteria from animal dung, human wastewater and birds can make water unsafe for people to swim in or gather kai from. This is often used as a measure of 'swimmability'. *E. coli* is the bacteria we measure in rivers and lakes as an indicator of other microorganisms that could be present. Faecal coliforms and enterococci are the bacteria we measure in estuaries and the sea. Find out more about how we monitor river health, here.

The Council has one monitored recreational bathing site in this FMU, located on the Tarawera River at Kawerau Bridge. Water quality at this site is in the C band. It is generally safe for swimming but has occasional increases of *E. coli* after rainfall. This means most of the time over summer there is only a very small risk of getting sick but there is higher risk if you swim or wade in the areas after rainfall. It is likely that swimming conditions will change further downstream.

There are no shellfish monitoring sites in this FMU.

Mahinga kai

The mahinga kai compulsory value includes the freshwater-related plants and animals that tangata whenua traditionally subsisted on, the places these are harvested from, the traditional materials sources from the environment and the tikanga (practices) of collecting or harvesting them. This value is demonstrative of tangata whenua connections, responsibilities and kaitiakitanga obligations. It is important because the loss of these species and associated tikanga can have a profound effect on tangata whenua who rely on them.

The Tarawera River provided an abundance of fish, eels, kākahi (freshwater mussels) and whitebait. Other valued species include kōura (freshwater crayfish), morihana (carp), pūkeko and watercress and along the riverbanks toetoe, tī kōuka (cabbage tree), harakeke (flax) and raupo.

We recognise the importance and value that tangata whenua and kaitiaki in the FMU place on mahinga kai, traditional materials sources and gathering sites throughout the FMU. Identifying these and understanding how tangata whenua and kaitiaki understand, assess and care for wai māori is critical to understanding and providing for the health of the mahinga kai compulsory value.

Where do contaminants come from?

In this FMU, industrial discharges contribute heavy metals, discoloration, dissolved organic material and also the largest single phosphorus load (39%) into the Tarawera River. It is understood that industrial discharges are now performing better than current consented limits and the geothermal discharge will be halved in the next couple of years as one discharge stops.

Dairy and forest cover make up most of the land use contributions to nitrogen load. In contrast, indigenous forests have a low N loss per hectare, but cover a lot of hectares. More intensive land uses like dairy occur over a smaller area but have higher a N loss per ha. *E. coli* loads follow a similar pattern.

Exotic and native forest are estimated to be the dominant sources of sediment, particularly native forest areas as these occupy a large part of the FMU and are on steeper land. Shallow landslide is the dominant erosion process and contributes the majority of the total modelled sediment load.

Freshwater health issues for this FMU

Lowland, heavily modified river tributaries that drain into Tarawera River have degraded water quality, ecosystem health, cultural values and natural character. While these have not been monitored over the long term, short-term monitoring illustrates they are characterised by generally high nutrient levels, high turbidity, extreme levels of DO (both high and low), elevated temperatures, and often very low MCI and QMCI scores. Nitrate and ammonia increase with rainfall. Habitat features that support ecological health are generally absent. The Lower Tarawera River is also heavily modified, with impaired water quality. The source of nutrient, sediment and bacterial loads is largely surrounding farming, and land drainage in the lowlands as well as industrial and wastewater discharges.

Industrial and municipal uses and associated point source and diffuse discharges have impacted water quality of the Tarawera River and continue to do so although there has been significant progressive improvement.

Wetlands in the lowlands are perched above surrounding drained land and at high risk of degradation as they lose their connection to the river. Wetlands in the lowlands have become more vulnerable as the ground of the Rangitāiki Plains has lowered and many of them became 'perched'. Water now needs to be actively pumped in to and/or contained within six wetlands to increase their water levels and maintain their health. The main natural wetlands remaining are Lake Pūpūwharau, Tahuna-Putanaki, Lake Tamurenui, Tumurau Lagoon, Awakaponga Wetlands, Awakaponga Stream, Awaiti Wetlands, Bregman's Lagoon, Tarawera Cut, Matatā Coastal Lagoon, Matuku wetlands, Kawerau Road wetland, Lake Tahuna, Lake Rotoitipaku, Mangaone Two, Mangaone Lake, and Lake Rotoroa. Several of these have significant cultural and ecological values.

Cultural indicators of health. We know there will be important cultural indicators that can provide a deeper understanding of wai ora. Identifying these and understanding how fresh water supports the cultural health and wellbeing of tangata whenua and how they understand, assess and care for wai māori is in relation to thier cultural health is critical to understanding and providing for the health of the mahinga kai compulsory value.

Question 5 Does this brief summary about water quality in this FMU seem about right to you?

Question 6 How satisfied are you with the water quality in this FMU?

What are we aiming for?

The NPSFM requires us to set targets for water quality that are at least as good as the baseline state of the rivers, and better than the national bottom lines set in the NPSFM. These targets are the specific, measurable levels of water quality or ecosystem health, which will help us to achieve the environmental outcomes (on previous page).

- Several attributes are in the A state band and we will need to maintain this; e.g., Ammonia (toxicity), and nitrate (toxicity) at long term monitoring sites (although improvement will likely be needed in drainage canals).
- Visual clarity (the attribute unit measured to determine the Suspended Fine Sediment attribute) at the Awakaponga long term monitoring site is below national bottom lines and must be improved.
- Phosphorus levels are high and need to reduce, although some will be naturally occurring.

From feedback we have received so far, we anticipate tangata whenua and communities will want:

- To achieve A or B band state for all attributes if this is achievable.
- To accept C band state or worse if that is naturally occurring, or if climate change predictions suggest no better can be achieved.
- To apply a reasonable timeframe to achieve this, so that any land and water users who need to make changes have time to transition. For example, if the target is to keep current water quality, and the trend is not getting worse, the timeframe could be immediate or up to five years.
- We will need to consider the implications for industry and land use of this.

Indicative scale of nitrogen, phosphorus, sediment and *E. coli* load reduction needed to improve water quality and meet draft environmental outcomes.

Nitrogen	Phosphorus	Sediment	*E. coli*
Small	Moderate	Moderate	Small

KEY: Indicative scale of change needed to improve water quality, or likely water quantity constraint.

Small | Moderate | High

How can we meet the outcomes and targets we set?

The outcomes we set for freshwater will be met via a mix of voluntary measures (things people choose to do themselves), investment and works/actions by Council, regulations the government has set that everyone must follow, and extra rules Bay of Plenty Regional Council sets in the Regional Plan. The rules we set in the Regional Plan will be where these are the most appropriate way to address remaining issues that are not likely to be addressed by national regulations.

Regional Councils must implement national regulations relating to freshwater (via consents, monitoring, and compliance). We cannot change these but can make additional rules if we think they are needed to address local issues. It is important to have a sense of what national regulations currently say:

National regulations for freshwater

Current national regulations require:

- Stock exclusion (with a 3 m buffer) from large rivers (>1 m wide), lakes and wetlands for dairy cattle on all terrain, and for drystock on low slope land (<5 degrees).
- Controls on activities within and close to river, streams, lakes and wetlands.
- Feedlots and stockholding area requirements: sealed; effluent collection, storage and disposal; 50 m setback from rivers, lakes, wetlands, bores, drains and the coastal marine area.
- Cap of 190 kg/ha/yr on the amount of synthetic N-Fertiliser applied to dairy farms, along with reporting requirements.
- Controls on intensive winter grazing on forage crops – subject to conditions or consent required.
- Consent required for substantial land use change from forestry to pasture, anything to dairy or dairy support, or extending the irrigated area within dairy farms (provisional rule expires 2025).
- Plantation Forestry: a number of practice requirements, including setbacks from rivers, lakes and wetlands, and requirements relating to earthworks, harvesting, slash and other activities.

Pending national regulations in 2023 are:

- Certified Freshwater Farm Plans will be required for all farms over 20 ha and horticultural enterprises over 5 ha. Farm operators will need to identify activities that pose a risk of contaminant loss and identify actions to reduce risks.
- New regulations requiring Regional Councils to control activities in drinking water source protection areas.

Draft water quality management options

National regulations are considered likely to make good progress towards the outcomes sought. Additional options we are exploring across the region, or specifically for this FMU include:

- When point source discharge consents are renewed (noting one geothermal discharge will stop all together in the next few years), strengthen conditions, including better discharge water quality, regular impact monitoring and reporting of key contaminants. To improve water quality in Tarawera River downstream of Kawerau, focus on reducing colour, phosphorus, and toxicants from the industrial site at Kawerau, and E. coli and phosphorus from municipal wastewater discharges.
- Exploring and encouraging ways to improve the resilience and quality of wetland values in the lower Tarawera FMU by restoring the hydrological connection from surface water to existing wetlands.
- Using Freshwater Farm Plans, require good management practice, set some minimum standards, and seek continual improvement to address rural land use practices that pose a high risk of sediment, nitrogen, E. coli and phosphorus loss.
- Requiring no net increases in E. coli, nitrogen, phosphorus, or sediment as a result of future land use and practice change (this may require offsetting). However, some consideration is also being given to ways to enable some development of underdeveloped Māori land over time.
- Require lined animal effluent storage and set effluent irrigation rate, timing and volume requirements.
- Gathering farm data on stock, feed, fertiliser and other farm and horticulture nutrient inputs, and consider setting a cap on high nutrient inputs.
- Controlling intensive grazing that removes vegetation cover and cultivation, including active management of Critical Source Areas (e.g., overland flow paths), in a similar way to national Intensive Winter Grazing Regulations.
- Requiring a raised dry pad for stock wintering on farm and storage of effluent in the lowlands, in order to reduce faecal and other contaminant runoff in heavy rainfall.
- Exploring and encouraging physical technological solutions such as treatment of drain water, treatment wetlands, and sediment control bunds in appropriate locations.
- Encouraging restoration of in-river habitat, and river margin habitat, including fish passage.
- Requiring consents for pumped drainage discharges and applying a best practicable option approach to reduce contaminants and restore habitat and fish passage over time.
- Encouraging stock exclusion from all rivers, streams and drains (in addition to those where it is required by national regulations) and requiring stock exclusion from large drains (>1 m wide). Maintenance of a thick grass sward on margins and/or planting of one side of drains and canals to provide shade and bring down water temperature. Require temporary stock exclusion from flow paths in the lowlands when wet.
- Encouraging retirement of steep (>25 degrees), erosion prone land to native trees, or removal of heavy stock.

- Requiring plantation forestry management plans at the time of afforestation to address sediment loss during and after forest harvesting.
- Encouraging feral animal control in native forest to maintain river ecosystem health and reduce sediment and E. coli losses.
- Encouraging retirement of land that is currently affected by salinity.
- Enabling land use change to land use that will contribute less contaminants and, in the lowlands, are appropriate to future wetter conditions.

Before any of these suggestions are proposed as rules in our regional plan, we need to assess their appropriateness, effectiveness, efficiency (including costs and benefits) – a big part of that is understanding what you, as part of the community, think about them.

Question 7 Does our approach to setting the water quality targets seem about right to you?

Question 8 On balance, what is a reasonable timeframe to achieve these water quality targets for this FMU?

Question 9 Do you support the suite of draft water quality management options being considered for this FMU?

Question 10 What minimum good land management practice requirements do you think we should consider in this FMU?

Te nui o te waipapa me te tukunga

Surface water quantity and allocation

Surface water is the water that flows in rivers, streams, or lakes. Across the region, water is taken for different uses, and is usually taken with a pump connected by pipe to rivers and streams.

What are we aiming for?

How much water we take from river streams for people to use will affect how much water is left for native fish and macroinvertebrates that depend on it for their survival, and for in-river cultural, recreation and other uses.

One of our main aims with water quantity is for people to know how much water is available to be used without causing in-river harm. We do that by managing water takes to ensure plenty of water remains to sustain habitats for the fish that live in rivers or streams, and generally thereby protect other values too.

The NPSFM hierarchy of obligations prioritises the health and well-being of rivers, streams, lakes, wetlands and groundwater first, then human health needs, and then ability of people to provide for social, cultural and economic wellbeing.

One of the ways we can do this is to protect native fish populations (and trout where appropriate) by setting limits on the total amount of water that can be allocated from each river or stream for people to use, and setting minimum flows, where users have to stop taking water if rivers and streams get too low. These limits can have a big influence of the health of rivers and streams, the things living in it, on the community, economic development and possible land use in the catchment.

How can we meet the outcomes we seek?

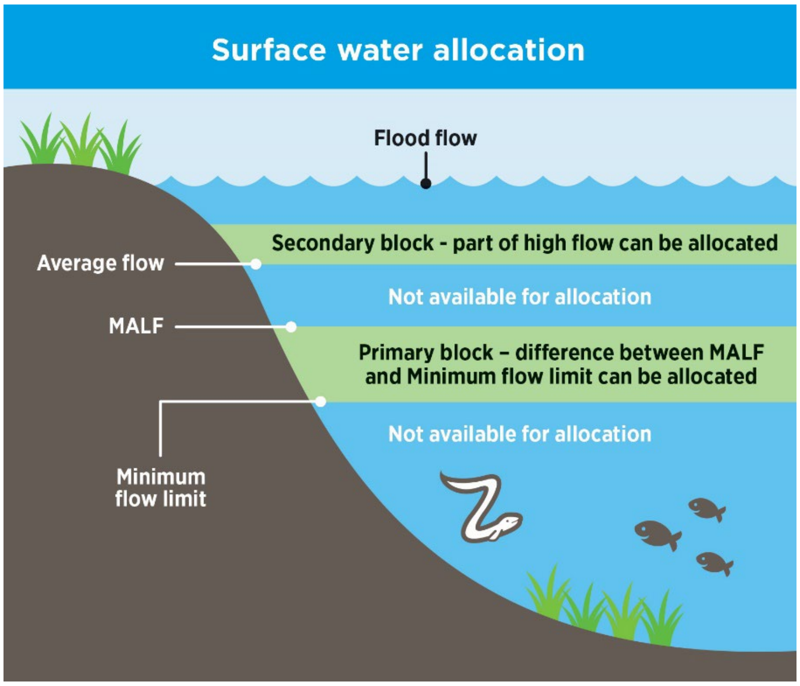
Our main tool for managing water quantity is the setting of minimum flows (limits to achieve the desired level of environmental protection).

Some rivers and streams are relatively resilient, and more water can be taken without affecting/damaging/stressing ecosystems, whereas others are more sensitive. Likewise, some fish prefer deep, fast flowing water and others prefer slower flowing, shallower rivers and streams.

Currently a ‘one size fits all’ approach is used to set limits for surface water takes from most rivers and streams in the region. This approach has a default minimum flow of 90% of the 1 in 5-year low flow (the average of the lowest flow recorded in a rolling 5-year period) and an allocation limit set at 10%.

In the Tarawera River rivers and streams, we now have three river and stream specific scientific studies to help us understand the likely effects of different water levels on the different fish populations in each river or stream. We are using this information to draft new minimum flow limits for individual rivers or streams, based on achieving a consistent level of habitat protection for native fish (and sometimes trout).

For rivers and streams where such studies are not available, we’ve based the limits on our knowledge of river or stream characteristics and the results of other studies.



The above figure shows how the minimum flow limit, primary allocation block and secondary allocation block relate to the flow in rivers and streams. Mean Annual Low Flow (MALF) is a commonly used measure that describes the average amount of water expected in rivers and streams during times of low flow. It is calculated by averaging the lowest weekly flow in each year of the flow record.

If people are allocated or authorised to take more water than the total allocation limit, rivers and streams are over allocated. The NPSFM requires us to not allow over allocation. While nobody wants to be told to stop taking water, especially during a drought, there is a trade-off between managing effects on the health of rivers and streams (constraining takes at the minimum flow), the amount of water available for people to use (allocation limits), and how often restrictions are needed (reliability).

Habitat retention levels

With a lot riding on the limits we set, we need to get them right. A key part of the consideration is what level of habitat protection we want i.e. At times of low flow, how much stress should organisms living ins river and streams experience (they will be used to some stress from natural causes).

A proposed habitat retention level we are aiming to achieve by setting these minimum flows is shown in the table below. The suggested levels for target native fish species are based on our understanding of how flows affect these fish species, and how scarce and vulnerable or resilient the species are. For example, shortjaw kōkopu and giant kōkopu are threatened species that are scarce and vulnerable, so the highest retention level is proposed.

We know other considerations may be needed too, including ensuring flows support mahinga kai, cultural or recreational values. For example, where trout are in a river or stream, we suggest setting habitat retention levels for those to provide for fishing values, so these are in the table below as well.

Target Species	Habitat retention level
Shortjaw kōkopu	100%
Giant kōkopu	100%
Other kōkopu species	95%
Kōaro (adult)	90%
Inanga	90%
Bullies (excluding bluegill)	90%
Eels (tuna) juvenile	80%
Eels (tuna) adult	75%
Torrentfish	70%
Bluegill bullies	70%
Trout	95%

Question 11 We are moving to limits on water takes based on habitat protection for fish. Does this seem the best approach?

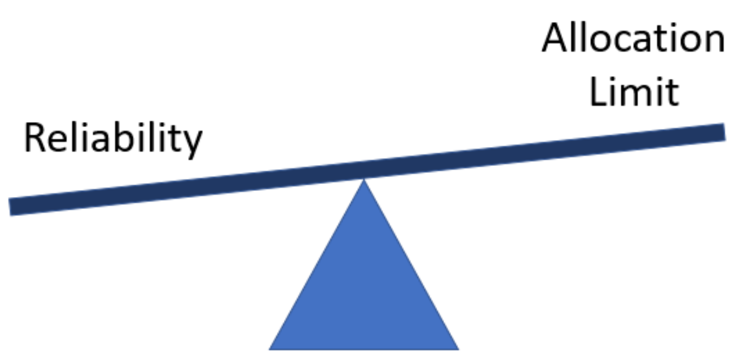
Water use

Once we've identified the minimum flow to protect the habitat for selected fish, we need to decide how much water is available to allocate to users.

The current default allocation limit is currently set at 10% of the 1 in 5-year low flow. Based on the current default allocation limits, several rivers and streams are currently considered over allocated in this FMU.

Reliability is a measure of how often authorised water users have to stop or reduce their water take (because rivers and streams are or would fall below the minimum flow). The higher the minimum flow, the more likely rivers and streams will fall to that flow due to natural conditions and the more frequently taking water will be restricted or stopped. The more water we allocate, the less reliable it is (the more often we need to restrict or stop water takes).

A study of flow patterns in the region's spring rivers and streams (such as found in the Tarawera River FMU) found that if the minimum flow was 90% MALF there would be an average of 14 days per year that flow falls below this level and no water would be available to take. In very dry years, the number of days below 90% MALF might be over 100. With lower minimum flows, the number of days that flow might naturally fall below the minimum flow reduces. At a minimum flow of 70% MALF (or less) flow is not expected to naturally fall below this level.



A balancing act: With a set minimum flow limit, there is a trade-off between the amount of water allocated for use and the reliability of water availability.

Question 12 Do you support or oppose the idea of encouraging more users to store water after heavy rainfall to help us all get through periods of drought?

Question 13 If you had to choose between a reliable water supply but very little water available and more water available but unreliably, which would you prefer and why?

Question 14 Sometimes our surface water challenges are because people take water at the same time. How willing would you be to work with others in your area to ensure water is taken from your stream(s) at different times?

Question 15 When the minimum flow is set at a high level, there isn't much water available to allocate and reliability is likely to be poor. Would you support reviewing the habitat retention levels of fish in over allocated catchments to increase the amount of water available for allocation?

Surface water quantity issues

The Draft Tarawera FMU is important from a water quantity perspective because it supports both large industrial uses and irrigation. There is a Hydroelectric Power scheme in the Karaponga Stream.

Parts of the catchment, including the main stem of the Tarawera River are identified by Fish and Game as important trout fisheries and spawning areas and the draft minimum flow relates to providing 95% habitat protection level to trout.

The main stem of the Tarawera river has very different characteristics than the tributaries and it is proposed that it be managed with different limits. The main stem is deep, fast flowing with a pumice base, making it ecologically resilient to the effects of taking water. An ecological minimum flow of 30% MALF achieves the habitat retention levels identified. Although large volumes of water are allocated from the Tarawera River, the low ecological minimum flow proposed for the main stem means it is not over allocated.

In the lower catchment (Rangitāiki Plains) much of the surface water is in drains or canals. It is difficult to determine flows or apply general models for ecological values in this area. Currently available information indicates that this area will be over allocated. However, it is more than likely that ecological values are constrained more by the poor habitat conditions and water quality than by flow. The Omeheu/Awaiti canal area is a tidally affected with flood gates and other constraints to habitat. Its status is not assessed.

Question 16 Does this brief summary about water quantity in this FMU seem about right to you?

Surface water quantity options

In the past, we used a single allocation block (10% of the 1 in 5 year low flow) because we didn't have enough information to do better. Now that we have more information about our rivers, we can approach allocation differently. In some areas habitats will now need to be better protected, and in other areas more water will be available to use. We are now considering key options for setting allocation limits.

Option set 1: Choosing Habitat Retention Levels (minimum flows)

The first set of choices we need to make concerns the level of protection we give to the main fish present in the river. Essentially, we are keen to know what you think of the Habitat Retention Levels in the table above. We could make them more protective, which would mean water takes would have to be restricted or stop more often, or less restrictive, posing a risk that low flows may reduce usable habitat for some fish. Surface water demand in this FMU is moderate and there is capacity for further allocation in most locations if the proposed ecological minimum flow and allocation limit is set.

For spring fed streams we've also identified an alternative minimum flow that maintains the habitat retention levels for native fish but may result in slightly lower retention levels for trout.

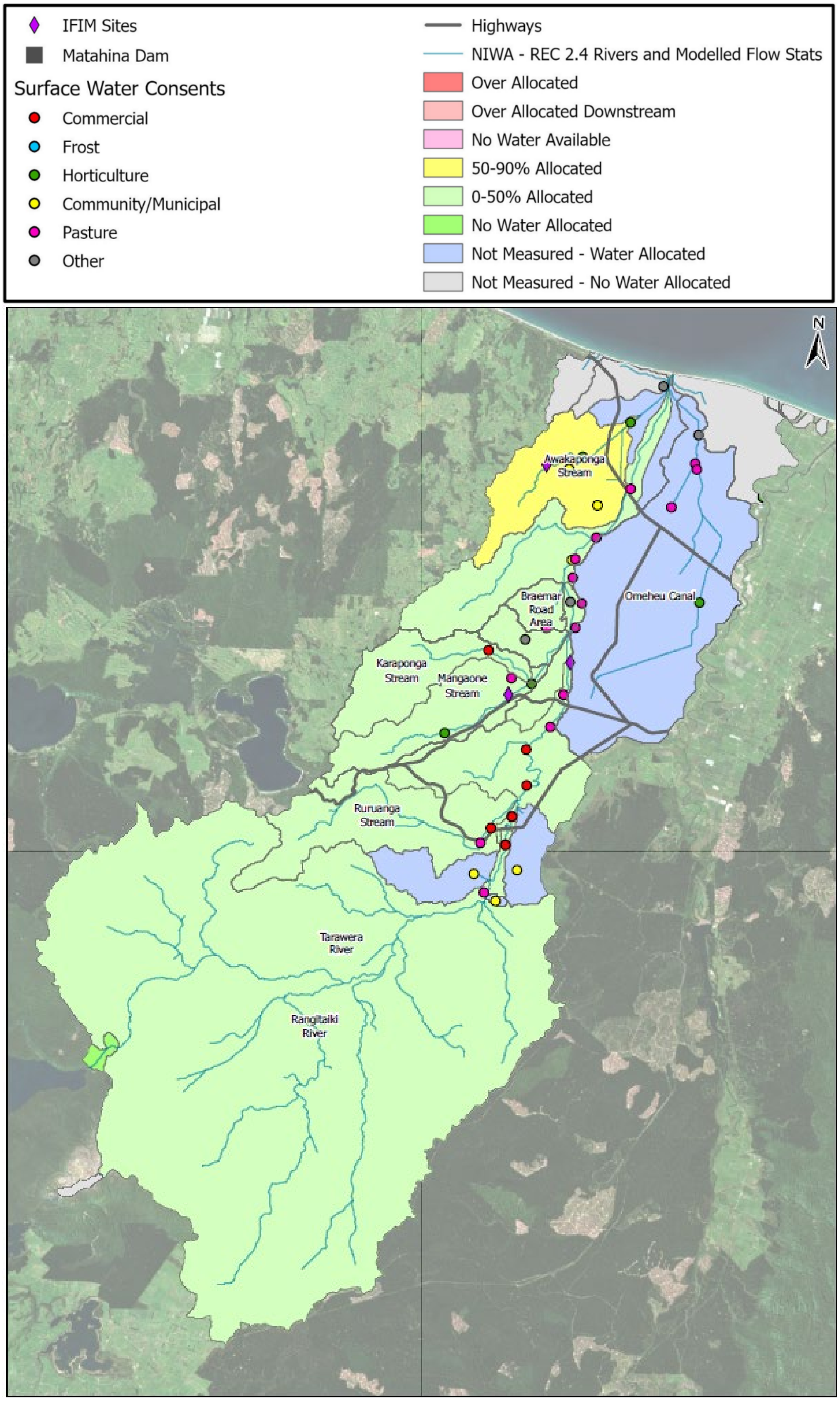
Option set 2: Deciding how much water can be allocated (primary allocation)

Our next choice concerns how much water to allocate and the effect of this on reliability for users. We propose that the allocation limit should be the difference between the Mean Annual Low Flow (MALF) and the ecological minimum flow (that provides the habitat protection levels noted above. The map on the following page shows the current allocation status using this option. The graphs show this option as the ecological allocation limit.

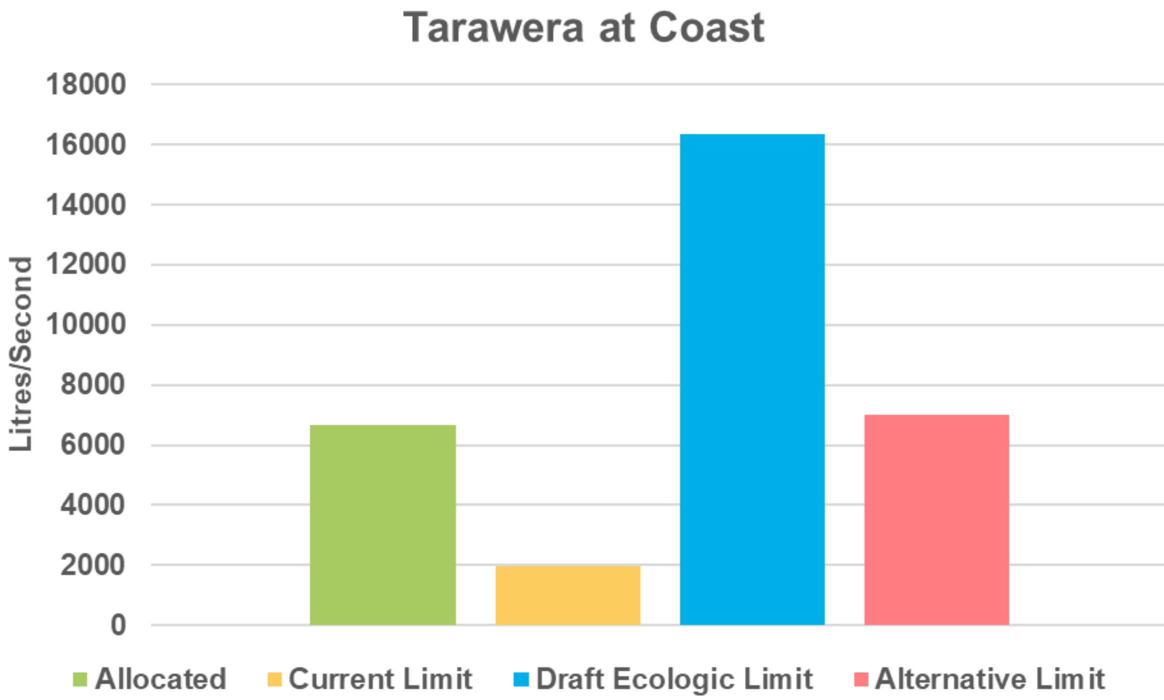
An alternative allocation limit is based on native fish species present (called the alternative allocation limit in the graphs below).

Option set 3: Primary and Secondary Block

We could allocate a lot more water (maybe twice as much) if we allocate a secondary block that can only be taken during periods of high flow. In this situation, users of the secondary block would probably need storage dams to provide reliable access to water during dry periods, because there will be more days when the allocated water cannot be taken.



Allocation status based on draft minimum flows, and a draft ecological allocation limit that is the difference between the Mean Annual Low Flow and ecological minimum flow.



Total water currently allocated to water users, current allocation limit (default allocable flow in the current Regional Plan), draft ecological allocation limit (total allocable flow using the difference between the Mean Annual Low Flow and the ecological minimum flow) and Alternative Allocation Limit for spring fed streams. (scale = litres per second)

Question 17 We have options to set water allocation limits for a catchment that are complex and species and area specific or more generic, simple and region wide. Which approach to water allocation limits do you prefer and why?

Question 18 A small number of catchments in the Tauranga Moana, Kaituna, Rangitāiki, and East Coast FMU's are currently over allocated. We may need to claw back or reduce the overall water allocation in some catchments. How do you think we should approach this i.e. prioritise particular uses, timeframes for transition?

Te nui o te wainuku me te tukunga

Groundwater quantity and allocation

Groundwater is the water that flows underground – through gravels, sand, mud and between the crevices in rocks. Groundwater can be taken for irrigation or storage and can usually only be accessed via a bore drilled into the ground. In general, groundwater is more costly to access than surface water, especially if it is difficult to find or extract.

We manage groundwater differently to surface water. For groundwater, our focus is much more on the annual volume of water taken, while the surface water we are concerned about the rate of take at any one time. However, our concern for groundwater takes, also relates to how they will affect surface water features such as wetlands, rivers and streams.

The Tarawera River FMU is characterised by volcanic rhyolite and ignimbrite deposits. Some of this ignimbrite (the Matahina Formation) hosts a significant productive aquifer. Where confined beneath the Rangitāiki Plain, above-ground artesian pressures cause the Matahina Formation to produce springs and free-flowing bores.

Issues

Currently consented groundwater abstraction (at 11.7 M m^3 /year) is predominantly confined to the coastal plain and low-lying areas of this FMU. Many of these takes are from a deep confined aquifer which receives recharge contributions from inland portions of the FMU. At an overall FMU scale, there is likely to be surplus availability of groundwater for further allocation, depending on what allocation regime is applied. However, there are likely to be parts of this FMU in which allocation pressure is greater around concentrated areas of higher demand.

Key issues in this FMU include the risk of saline intrusion from large or concentrated takes near the coast.

An additional risk here is the potential for land use to have impacts on groundwater and hydrologically connected surface water (lakes).

Policy options

Utilisation The relatively low level of groundwater use in this FMU leaves potential for more use if needed. Groundwater allocation policy may not need to be particularly restrictive on takes. Options include potential to encourage the use of groundwater in preference to surface water, and to encourage the use of deeper, confined groundwater in preference to shallower, unconfined groundwater.

Efficient Use. Across all FMUs consideration is being given to how to achieve more efficient use of freshwater; i.e. ensuring water allocation (what we consent) more closely matches need (what is used). This is because allocation status (whether an area is overallocated or not) is calculated based on what is allocated and theoretically able to be used (not what is actually used).

Confined aquifer(s). The presence of water in largely confined aquifers with much less stream depletion effects means that less emphasis may need to be placed on assessing surface water impacts. This could simplify resource consent applications in this FMU.

Good quality deeper water. Groundwater quality in the deep confined aquifers is good. Protecting the good quality of the deeper resource so that it is only available for potable water use may be something communities want to pursue.

Groundwater Management Zones. Next steps for this FMU include developing new Groundwater Management Zones within which allocation limits are set. Given the potential for some localised areas of depletion – despite the overall availability of groundwater, care will be needed to ensure these zones appropriately balance the need for administrative simplicity, equity and risk. How these zones are formed is something we will seek feedback on. Allocation limits may need to be set conservatively near the coast to avoid cumulative saline intrusion

The Tarawera FMU is included within BOPRC's regional scale groundwater flow model for the Rangitāiki, Tarawera and Whakatāne areas. This model will be used to inform the limit setting process by simulating various levels of hypothetical groundwater abstraction and evaluating the associated cumulative effects on river baseflows and groundwater levels.

Question 19 Does this brief summary about groundwater quantity in this FMU seem about right to you?

Question 20 Groundwater is managed primarily to protect and maintain surface waters, and to meet current and future beneficial uses. What other things should it be managed for?

Question 21 Our understanding of groundwater availability is incomplete. We can set groundwater allocation limits that are lower i.e. more conservative or higher i.e. greater risk of overallocation. Where on the spectrum of risk are you?

For more information go to www.boprc.govt.nz/freshwater-info

Ngā mea e whai ake nei
Next steps

Feedback can be provided via our online platform, in person at community meetings, or in writing via post.

You can sign up to receive our Freshwater Flash e-newsletter at **boprc.govt.nz/newsletters** follow our social media or visit our website for regular updates.

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