

Te Kōrero o te rōpū whakahaere o te wai māori o Te Wahapū o Waihi

The Waihi Estuary 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 Waihi Estuary Freshwater Management Unit (FMU). These options are to do with how we manage freshwater in Waihi Estuary 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.





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.



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

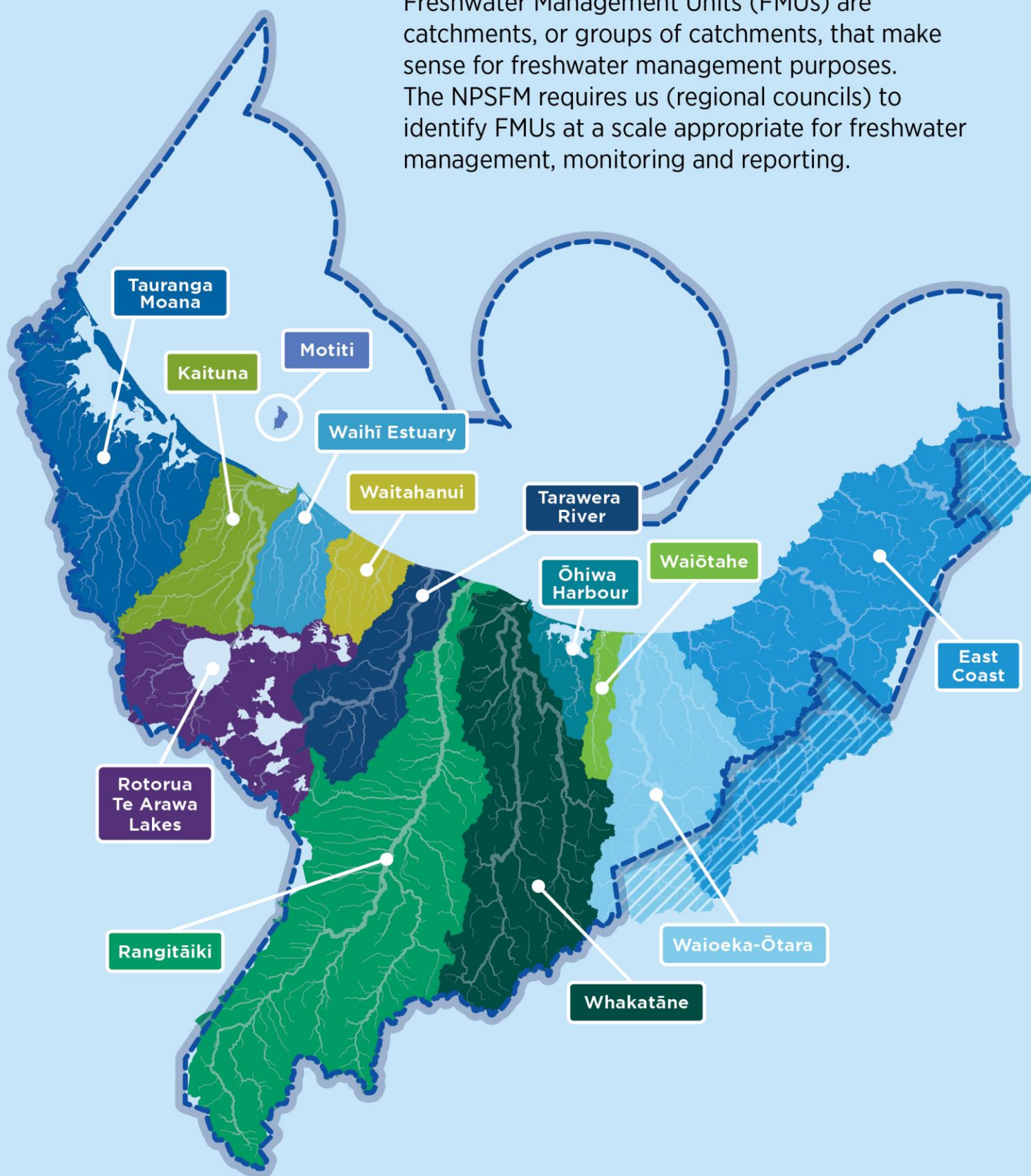
- Head to boprc.govt.nz/freshwater
- Read our Region Wide Overview booklet
- Sign up to receive our Freshwater Flash e-newsletter at boprc.govt.nz/newsletters
- Follow our social media
- Visit participate.boprc.govt.nz



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.



Mō te tauira o te rōpū whakahaere o te wai māori o Te Wahapū o Waihi

About the Draft Waihi Estuary Freshwater Management Unit (FMU)

The Draft Waihi Estuary FMU includes the catchments of the Kaikōkopu, Pokopoko, Mangatoetoe, Puanene, Wharere streams, the Pongakawa River and the Pukehina Stream (Canal), which flow into the Waihi Estuary. The catchment covers an area of 35,750 hectares with headwaters north of Lake Rotoiti which is the likely source of water for the large springs at the head of each major stream.

The lowland plains were originally wetlands, and are now drained by a network of drains, canals and pump stations operated by the Waihi District Drainage Society which draws the water table down below the grass root zone to enable agriculture.

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

Tangata whenua

- About 22% of Waihi Estuary FMU land area, or about 7,700 ha, is Māori-owned land. Land use on Māori-owned land is dominated by exotic forest (46%), dairy (20%), sheep and beef (16%) and native forest (14%).
- Ngāti Whakahemo, Ngāti Makino, Ngāti Pikiao, Ngāti Whakaue, Tapuika and Ngāti Pukenga have key interest in the catchment. Ngāti Rangitihī, Ngāti Rangiwehē, Waitaha, Ngāti Awa, Ngāti Tuwharetoa (Bay of Plenty), also have interests and/or heritage associated with Waihi Estuary.
- Māori communities are based around hapū and marae, and are very closely connected through whakapapa. Tangata whenua view the estuary and parts of the catchment as degraded and in need of substantial improvement.
- Te Wahapū o Waihi is a recently established iwi collective with members from Ngāti Whakahemo, Ngāti Whakaue, Ngāti Mākino, Ngāti Pikiao and Tapuika. They are focussed on restoring the health of the Waihi Estuary, and have recently secured national funding to progress their work.
- Tapuika has a statutory acknowledgement over the Pokopoko Stream and Ngāti Pukenga has a statutory acknowledgement around the margin of the Waihi Estuary.
- Council is committed to continuing the journey to involve tangata whenua in freshwater management and to support Matauranga Māori.

Communities

- As of June 2022, the population of this FMU was estimated to be 4,630 people, concentrated in the lower part of the catchment, particularly Paengaroa and Pukehina Beach. The population is projected to increase by between 7% and 39% by 2048.
- Community feedback so far has identified shellfish gathering, whitebaiting and fishing in the Waihi Estuary, lots of freshwater recreation (kayaking and swimming) locations along the Pongakawa and Kaikōkopu Streams, and harvesting of watercress and eels in parts of the catchment. The Pongakawa Stream and wetland, Kaikōkopu and Pukehina Canals,

Waewaetutuki, Waihi and McCarthy wetlands, and springs in the Puanene Stream, and Pongakawa Valley were all identified as having natural form and character value.

- People who responded to our surveys in 2021 and 2022 were generally happy with the current state of the Pongakawa swimming hole and Waihi wetland (home to the bittern marsh, crake and other rare birds) but wanted improved safety (for human consumption) of shellfish gathered in the estuary.
- A community group called Wai Kōkopu was established by local farmers and growers concerned about the state of the Estuary, with a focus on farm planning and action to reduce impacts, supported by national and regional funding. There are other community groups focussed on biodiversity restoration or enhancement, such as the Maketū Ōngātoto Wetlands Society and the Rotoehu Ecological Trust. This FMU is also a focus catchment for Council, supporting the likes of fencing and planting, and research into technical solutions.

Land and land use

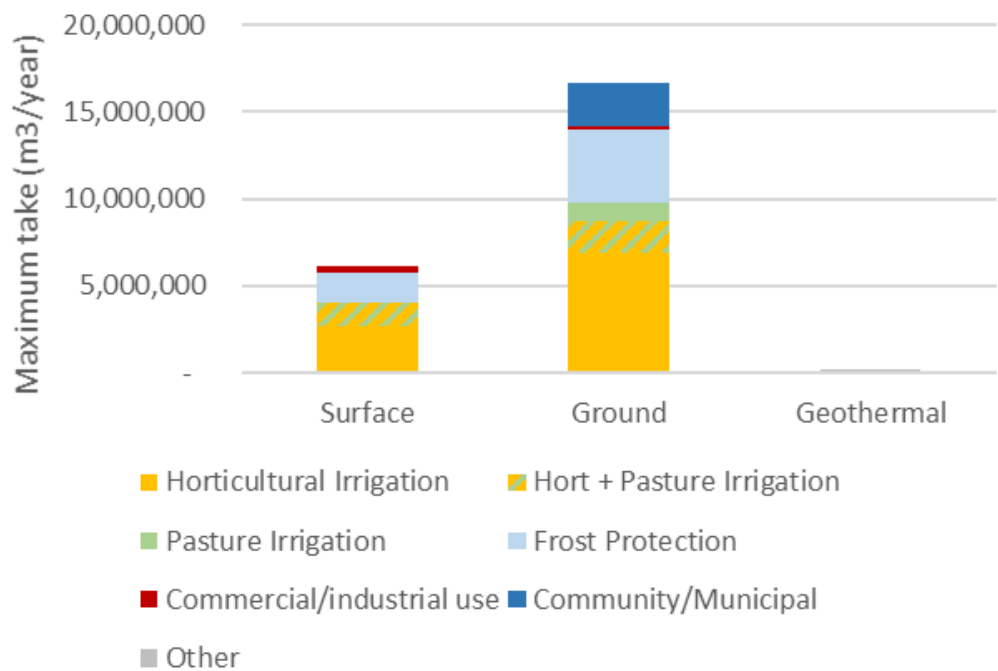
- The geology is dominated by volcanic material, with some peats and sands in the lowland drained areas.
- Land use in this FMU is 40% dairy, 19% exotic forest, 16% drystock, 12% native forest and 6% kiwifruit. It has the highest percentage of dairy land use in any of the FMUs in the region and the lowest percentage of native forest cover. Conversion of suitable dairy and drystock land to kiwifruit is occurring rapidly.
- Dairying and drystock farming in the Western Bay of Plenty District is estimated to contribute \$88 million and \$28 million respectively to the Bay of Plenty's regional GDP in 2020/21. Kiwifruit growing and other horticulture are estimated to contribute \$194 million and \$27 million, respectively. This FMU contributes towards these figures.

Rivers, streams, wetlands, and estuaries

- This FMU includes the catchments of several streams that drain into the Waihi Estuary, including the Pongakawa, Kaikōkopu, Wharere, Pokopoko and the Pukehina Canal. A large part of the catchment was previously lowland wetland which has been drained for pastoral use. Lower reaches of rivers have been straightened. The drainage network is actively managed by the Waihi District Drainage Society.
- Waihi Estuary is an area of significant cultural and biodiversity values.
- The FMU provides habitat for a range of threatened bird species and two plant species that rely on water bodies. Eight areas are identified for their significant coastal biodiversity. Three priority biodiversity sites involve a river, stream or wetland or the estuary within this FMU.
- There are 76 ha of wetland in this FMU (approximately 2% of the historical extent).
- Kohioawa Beach Dunefield and Wetlands are identified as outstanding natural features and landscapes under the Regional Coastal Environment Plan.
- Fish and Game have identified that adult trout are present and/or spawn in Pongakawa Stream. Tuna (eels), inanga (whitebait) and trout were also identified in the lower part of the FMU.

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, drinking/household supply and for food production (mostly horticultural irrigation/frost protection in the coastal area).
- As of January 2022, there were 161 water take consents in the FMU (28 surface water, 130 groundwater and three “warm” geothermal). The majority of consents and consented volume is for horticultural irrigation and frost protection.
- The Western Bay of Plenty District Council has two bores for community supply to its Eastern Supply Zone near Maniatutu Road, Pongakawa.
- Other than activities associated with agriculture, there are no commercial or industrial activities taking water in this FMU.
- Part of this FMU is located within the Tauranga low temperature geothermal system. However, there are no geothermal takes for heating purposes.



Waihi Estuary (Waihi -Pongakawa) Resource Consents to take water – volume m³/year

- There are no major industrial/commercial point source discharges in this Draft FMU but there are 29 discharge consents to land, 16 On-Site Effluent Treatment discharge consents and five discharge consents to water. These include farm dairy effluent storage and discharge. The lowland pumped drainage network discharges into rivers.

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

- Climate change projections are that sea level rise will change the Waihi Estuary and its values, and current productive land uses in the lowlands may be inundated by the sea or affected by saline groundwater intrusion, becoming less viable or unviable in the medium to long term. Some areas of pasture are already affected by salinity and so are less productive. This needs to be considered when establishing management options for water quality and ecosystem health.
- 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 spring fed catchments such as the Pongakawa, changes to low flow are likely to be subdued, although increases in evaporation and transpiration may result in increased demand. There may be higher flood flows in summer and winter.
- Climate Change is predicted to cause larger and/or more intense rainfall events, and a large increase of soil erosion, particularly in existing gullyheads and steeper pastoral areas. Sediment loads to the estuary are predicted to increase.

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:

Option A1 *Ka ora te wai, ka ora te taiao, ka ora te tangata*

Our water is healthy, our environment is healthy, we are healthy and prosper. The mauri and life giving properties of land, rivers, streams, aquifers, wetlands and the Waihi Estuary are restored, to the fullest extent possible.

- 1 Shellfish gathering in the Waihi Estuary will be safe to eat.
- 2 Innovative and sustainable land and water management practices support food production and flood mitigation so that waterways are safe for human contact, mahinga kai thrives and the ecosystem health is enhanced.
- 3 In lowland freshwater bodies, habitat for indigenous species (particularly whitebait), and natural form and character is restored and recreated over time.
- 4 Pasture affected by climate change salinity impacts will be reverted to a sustainable landuse such as saltmarsh.

This vision is to be achieved by 2065

Option A2 *Ka ora te wai, ka ora te taiao, ka ora te tangata*

Our water is healthy, our environment is healthy, we are healthy and prosper.

- 1 The mauri and life giving properties of land, rivers, streams, aquifers, wetlands, and Waihi Estuary are restored.
- 2 Rivers, streams, wetlands and the Waihi Estuary provide sufficient food for our community and manuhiri, and sustain our spiritual wellbeing.
- 3 We have access, swim safely, and gather kai, in rivers, streams, wetlands and especially in Waihi estuary.
- 4 We have more wetland ecosystems that provide healthy habitats for flora and fauna and access for cultural and educational use.
- 5 River flows provide for freshwater fish habitats, customary resources and customary use.

- 6 Cultural values, connections, heritage, traditional practices and knowledge, and sites of significance are protected, revitalised and celebrated.
- 7 Healthy taonga fish, shellfish and seaweed populations return to the Waihi Estuary.
- 8 We are prepared for, and resilient to, flooding, coastal erosion and the effects of climate change.
- 9 Tangata whenua are actively involved, effective and influential within resource management processes, projects and decisions.
- 10 Only when these things are provided for; people enjoy efficient, accountable and responsible use of precious water for social, economic, and cultural wellbeing.

In lowland rivers, streams and wetlands: Habitat for indigenous species (particularly whitebait), and natural form and character is restored and recreated over time.

The vision is to be achieved by 2065

Option B *He oranga te wahapū, he oranga te iwi:* the health of the estuary is a metaphor for the health of the people.

Te Wahapū o Waihi will be succeeding when we have a healthy mahinga kai, as an indicator of a thriving Waihi estuary, catchment and community, for the long term.

The vision is to be achieved by 2065.

Question 3 As a draft vision do you prefer Option A1 or A2 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 tangata whenua and community feedback as well as our own research to identify the values we think matter most in this draft FMU. We have heard that people want to be able to swim and gather kai without getting sick and want to know that the water supports a range of fish and other native animals. We have also heard that looking after streams and wetlands enhances their mauri.

Water is also valued as a resource for people and communities to use – at marae and in households, as drinking water for animals, for irrigation and food production. Water is important for the livelihoods of local people, but we must make sure its use does not damage ecological health or diminish mauri. There is a high level of concern about the state of the Waihi Estuary and its values.

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

Freshwater Values <i>The ways fresh water is important</i> <i>Shaded values are compulsory national values in the NPSFM</i>	DRAFT Environmental outcome <i>How we would like the values to be</i>
Ecosystem health	Water quality is improved to enhance the health of the Waihi Estuary (including minimising sedimentation, in alignment with Objective 7 of the Regional Coastal Environment Plan). Flows sustain aquatic life and provide necessary flushing of Waihi Estuary to support restoration of ecological health. Restore and enhance the health and diversity of ecosystems and habitats for valued flora and fauna species. The diversity and abundance of desired aquatic species is maintained or improved and pest species are controlled. Restore, protect and enhance the wetlands and protect the health and natural functioning of key components and processes.
Human contact	Water quality is improved to be suitable for swimming, shellfish gathering and other forms of human contact activities with low risk of getting sick.
Threatened species	Protect critical habitat to support the presence, abundance, survival, and recovery of threatened species.
Mahinga kai	Water quality is improved to sustain plentiful kai which is safe to eat, within rivers, streams, wetlands and the Waihi Estuary. Restore, maintain, and protect the mauri of freshwater resources to support the continuation of mahinga kai practices and associated tikanga.
Natural form and character	Natural form and character is restored over time in lowland rivers and streams, maintained and improved in mid and upper catchments.
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	Water quality and flows will be suitable for customary rituals and ceremonial activities.
Transport and tauranga waka	Sedimentation and flows from the catchment are managed to enable navigation/tangata waka in the Waihi Estuary main channel and rivers.
Fishing	Restore and enhance freshwater and ocean fisheries.
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.

Freshwater Values <i>The ways fresh water is important</i> <i>Shaded values are compulsory national values in the NPSFM</i>	DRAFT Environmental outcome <i>How we would like the values to be</i>
Geothermal warm water	Not considered to be a significant value in this FMU. Significant geothermal warm water resources are protected from the cooling effects of activities and made available for efficient uses that require heat or heated water.

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.

Waihi Estuary health

The main estuary attributes we measure are mud content, algae and seagrass cover, and sediment nutrients – like nitrogen and phosphorus. Like the NPSFM, the New Zealand Estuary Trophic Index (ETI) has a grading system that uses the same A-D bands.

Waihi Estuary ecosystem health is in a poor state - in the C band. Nutrients have caused algal blooms and there is a lot of soft sediment in the estuary. Seagrass cover in the estuary has reduced significantly over time. Sediment, phosphorus, and nitrogen loads from the catchment are the key cause of this.

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](#).

The Bay of Plenty Regional Council has three monitoring sites in this FMU to measure states and trends in river and stream water quality. In areas where we don't have enough monitoring data, river health has been estimated by an Expert Panel using the best information available. This gives us a sense of states 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.

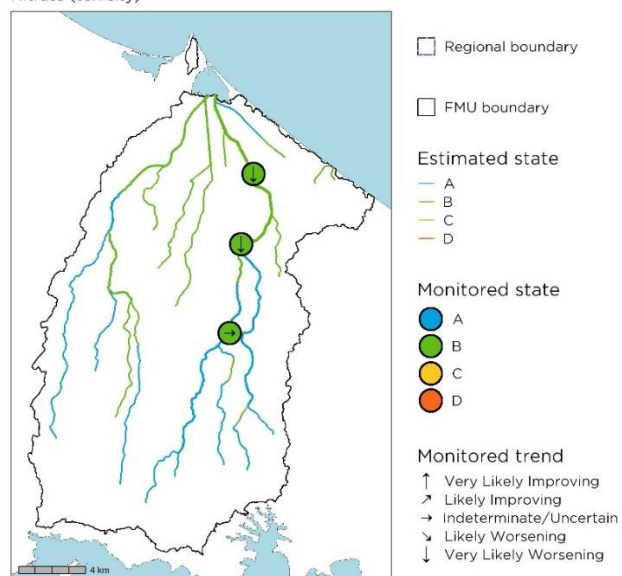
Measured nitrogen concentrations are well below levels that can have toxic effects - in the B band but are some of the highest in the region and two sites are showing worsening trends.

Measured dissolved reactive phosphorus concentrations are high – in the D band but are showing improving trends. The high phosphorus is likely from the volcanic influence in the area, although human activity will be adding to this.

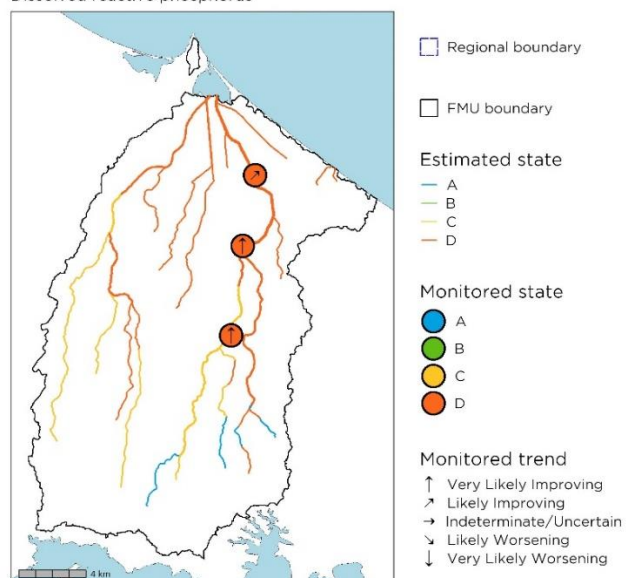
Measured suspended fine sediment is in the A or B bands, and one site shows an improving trend. Large wet weather events can contribute harmful pulses of sediment that may not be reflected in this data.

In addition to these monitored sites, surveys of lowland drainage canals in Waihi FMU show quite poor water quality, with the Wharere Stream being the worst of the main inflows.

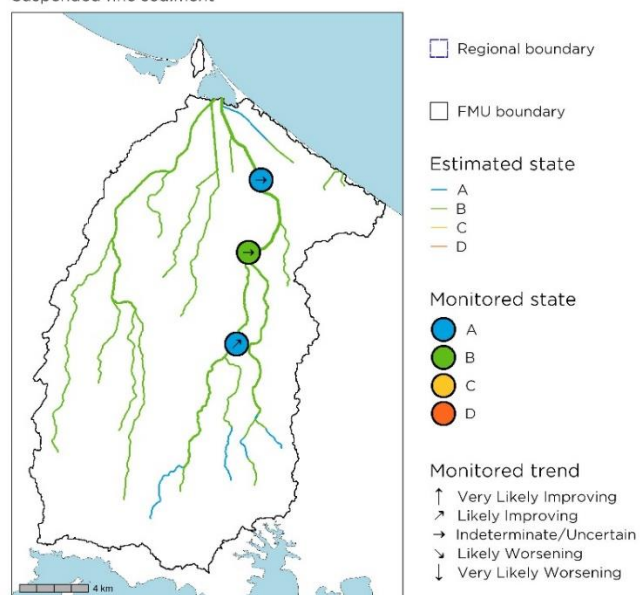
Nitrate (toxicity)



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 nutrient enrichment 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](#) at www.boprc.govt.nz/wet for more information.

Fish surveys in rivers and streams in this FMU show 13 fish species, 11 of these are native. Longfin eel, shortfin eel, and redfin bully were the most common. Diverse fish communities can be found even amongst highly modified environments, as long as fish passage is maintained, and adequate instream habitat and water quality conditions are maintained. This is particularly relevant in the lower parts of the FMU where pump stations and floodgates are present.

The Council has five macroinvertebrate monitoring sites in the Waihi FMU to measure state and trends in river health. These sites were in B and C bands for MCI and show degraded ecological health. This degraded ecological health is common in catchments dominated by agriculture.

In addition to these monitored sites, some surveys of lowland drainage canals on the Kaituna Plains show quite poor ecological health.

Whilst not toxic in Waihi Estuary FMU, nutrients like nitrogen and phosphorous can promote plant, weed and algal growth and are contributing to the poor health in Waihi Estuary. Plant, weed and algal growth in rivers and streams in Kaituna FMU with mobile pumice beds is generally not an issue, but it can be a problem in some lowland drains and in the estuary.

Human contact

The main human health attributes we measure are bacteria and cyanobacteria (blue/green algae). 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 bacteria 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 two monitoring sites for human contact in Waihi Estuary FMU, one site on Pongakawa Stream and the other in the estuary. Water quality is B band in the Pongakawa Stream and there are large increases in bacteria after rainfall. This means most of the time over summer there is a small risk of getting sick but there is higher risk of getting sick if you swim or wade in the stream after rainfall. Flushing from the ocean helps to make the estuary generally safe for swimming - B band, although there are also increases in bacteria after rainfall. Modelling indicates water quality is not acceptable for contact recreation in some lower catchment rivers and streams that are not monitored.

Despite these sites being generally safe for swimming, bacterial contamination in the estuary means that shellfish are not safe to harvest most of the time, so a permanent shellfish gathering warning has been put in place by Toi Te Ora Public Health for the past few years.

Mahinga kai

The mahinga kai compulsory value includes the freshwater-related plants and animals that people can eat, the places these are harvested from and the tikanga (practices) of collecting or harvesting them. It is important because the loss of these species can have a profound effect on the communities who rely on them.

Within this FMU, the entire Kaikōkopu and Wharere Streams and Pongakawa River are identified as important for mahinga kai in the Te Rautau Te Rāhui Taketake - Ngāti Whakaue ki Maketū Hāpu Management Plan. Mahinga kai values identified through community feedback so far include kahawai and snapper in the lowlands, birds, watercress, inanga (whitebait), tuna (eels), tuangi (cockles), oysters, kākahi (freshwater mussel), pipi, flounder, herring, and ducks.

We know there are other important traditional harvest sites and species in this FMU, but don't have much information about how tangata whenua would assess their state yet. We welcome any information tangata whenua wish to provide.

Where do contaminants come from?

All land uses contribute nitrogen, phosphorus, suspended sediment and *E. coli*, and some level of these is natural. Dairy farming is estimated to contribute disproportionately more nitrogen, phosphorous and *E. coli* load compared to its land area. Drystock farming, kiwifruit and other horticulture, exotic forestry and native forest all contribute to sediment and phosphorus losses.

Within each landuse, there is a wide range of practice on each property. For example, some kiwifruit growing and other intensive horticultural activities can have high nitrogen losses and contaminant runoff. There are some areas of land naturally have a higher risk of losses. For example, steeper land with higher rainfall often has higher risk of sediment and *E.coli* runoff over land. Wet areas, overland flow paths, porous soils, and pumped drainage areas pose greater risks that contaminants will enter rivers, streams, wetlands, groundwater and/or the estuary.

Shallow landslides are likely the dominant erosion process for sediment generation over the long term. However, on an annual basis, surface erosion, rilling, gullyhead and streambank erosion are all relatively significant given the often poor soil cohesion, especially where vegetation cover and root mass is low. Forest harvesting, drain clearance and recontouring for kiwifruit or urban development are also potentially significant localised sources.

Freshwater health issues for this FMU

Waihi Estuary has significant ecosystem, cultural and recreational values, which are degraded by contaminants causing high mud contents, loss of sea grass extent and an increase in macroalgal blooms over time. This is the result of hydrological modification and land drainage in the catchment, high contaminant loads from rural land uses, and potentially current drain management. Large reductions in contaminant loads are required to support improvements in health, potentially followed by actions within the estuary itself to address legacy effects of sediment and nutrients already accumulated.

Substantial faecal contaminants in the estuary mean that shellfish are not safe to harvest most of the time, and there is a permanent health warning in place. While water quality is still safe for swimming most of the time, there are periods after heavy rainfall when it is not. During these events lowlands become saturated, and bacteria from rural land uses is transported directly to drains and rivers.

Lowland rivers, streams and wetlands have degraded water quality, ecosystem health, cultural values, and natural character. Some of the lower reaches have not been monitored over the long term, but short-term monitoring shows high nutrient levels, high turbidity, extreme levels of dissolved oxygen (both high and low), elevated temperatures, and low invertebrate scores. Nitrate and ammonia concentrations clearly increase with rainfall. Habitat features that support good ecological health are generally absent in these lowland rivers and streams. Contaminant sources are primarily in drainage from rural land uses, particularly in the lowlands, but these land uses are also an important contributor to the economic wellbeing of many members of the local community and the region.

We know there will be important cultural indicators that can provide a deeper understanding of wai ora, but don't have much information about these. We welcome any information tangata whenua wish to provide.

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 and limits 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).

Estuary values and outcomes will drive the need for substantial change within this FMU to reduce the four key contaminants: in the order of 70% for nitrogen, 30% for phosphorus, 25%-50% for *E. coli*, and 20%-65% for suspended sediment. These are very large reductions. Actions within the estuary to remove macroalgae and mud and improve flushing would also be needed to achieve the draft vision and outcomes.

Where freshwater quality is below national bottom lines, it must be improved. This includes macroinvertebrates at several monitoring sites. We will need to restore habitat and aquatic life in the lowlands.

Naturally occurring processes are likely to be a key contributor to poor states for phosphorous and we are working to understand this better, to make sure any targets are realistic.

E.coli in Pongakawa River at Old Coach Road, and likely across all of the lowermost stretches of rivers and streams needs to improve.

There are some choices to make about how much improvement to seek. From feedback we have received to date, we anticipate tangata whenua and communities will want:

- To achieve A or B band state for all attributes if this is achievable.
- To apply a reasonable timeframe to achieve this, so that any land and water users who need to make changes have time to transition. It is suggested that a timeframe of 40 years is needed to fully achieve targets and large contaminant load reductions for this FMU, with 10 yearly targets to measure progress along the way.
- To accept C band state or worse only if that is naturally occurring, or if climate change predictions suggest no better can be achieved.

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

Nitrogen	Phosphorus	Sediment	<i>E. coli</i>

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

Small	Moderate	High
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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 rivers, 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 policy options

A large amount of work is underway in the catchment to improve the state of the estuary. Significant contaminant reductions will be achieved by these programmes, and national regulations, including Freshwater Farm Plan requirements. However, additional regional rules will also be required to achieve the large load reductions needed. It is considered likely that, over the long term, some land use change will be necessary.

Options we are exploring for this FMU could include:

- Achieving a large reduction in Nitrogen, Phosphorus, Sediment and *E. coli* from the catchment over time. 40 years is suggested with 10 yearly interim targets to measure progress along the way.
- Using Freshwater Farm Plans to reduce risk, set minimum standards and continual improvement requirements to address rural land uses and practices that pose a high risk of sediment, nitrogen, *E. coli* and phosphorus loss, particularly in the lower catchments. Require good management practice and a shift towards low risk as fast as possible, and a commitment to continual improvement.
- Gathering farm data on stock, feed, fertiliser and other farm and horticulture nutrient inputs.
- Controlling nutrient inputs across the whole catchment, starting with a cap on high levels of nutrient inputs, and potentially a sinking lid approach, stepped over time.
- Controlling intensive grazing that removes vegetation cover (such as strip grazing), cultivation and potentially horticulture, requiring active management of Critical Source Areas (overland flow paths), in similar way to national Intensive Winter Grazing Regulations.
- Exploring and encouraging physical technological solutions such as treatment of drain water, treatment wetlands, and sediment control bunds in appropriate locations.
- Requiring no future net increases in *E. coli*, nitrogen, phosphorus, or sediment as a result of future land use and practice change (this may require offsetting).
- Requiring retirement of land affected by salinity on estuary margins now, and that likely to be affected within the next 10 years as sea level rises over time.
- Encouraging restoration of in-river and in-estuary habitat, as well as estuary and river margin habitat, including fish passage.
- Encouraging land use change to land uses with lower contaminant losses, by providing incentives or removing barriers for land use change where we can. Indicate that land use rules will be revisited in 10 years.
- Controlling grazing of steep (>25 degrees) erosion prone land – either no stock or stock size constraints.
- Continuing to reduce Phosphorus, *E. coli* and nitrogen from point source discharges via tighter conditions for resource consents, including requiring lined animal effluent storage and effluent irrigation rate, timing and volume requirements.
- Requiring stock exclusion from estuary margins and all permanent and intermittent rivers, streams, canals (which are modified rivers!) and drains. 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.
- Requiring temporary stock exclusion from ephemeral flow paths when wet.
- Requiring a raised dry pad for stock wintering on farm and raised or enclosed effluent storage in the lowland drained areas, to reduce contaminant runoff in rainfall.

- Requiring consents for pumped drainage discharges and apply a best practicable option approach to reduce contaminants and restore habitat and fish passage. Consider constraining periods of time that flap gates can be closed, treatment of drain water prior to discharge, reducing the area serviced, and/or good practice drain management requirements.
- Requiring plantation forestry management plans at the time of afforestation to address sediment loss during and after forest harvesting.
- Restricting new irrigation and managing all irrigation (particularly on pastoral land) as these tend to increase contaminant losses.
- Restoration of habitat along the main land drainage canals over time, which may require some retirement of land (e.g., to re-establish meanders, riparian habitat, whitebait spawning and refuge areas, wetland margins)
- In the longer term, considering planned removal of macroalgae and sediment from the estuary and potential additional flushing options.

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, and lakes. Across the region, water is taken for different uses, and is usually taken with a pump connected by pipe to the river or stream.

The Kaikōkopu Canal and the Pokopoko, Oeuteheuheu, Wharere and Pongakawa Streams have stable spring fed flows. There are also many small coastal streams in this FMU which Regional Council does not hold any flow information for.

The soils are mainly porous pumice with permeable rock types, resulting in rapid infiltration of rainfall and relatively stable stream flows, strongly fed by groundwater and with high specific discharge rates. The buffering effect of groundwater inflows means the streams are relatively insensitive to seasonal variations in rainfall, but very sensitive to longer term trends.

What are we aiming for?

How much water we take from rivers and 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 and 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 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 or streams get too low. These limits can have a big influence of the health of rivers or 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?

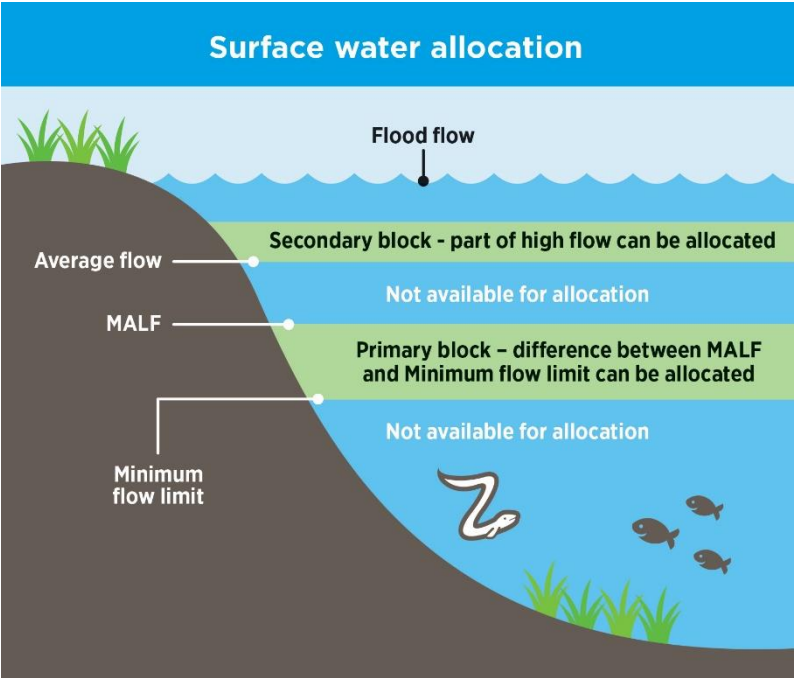
Our main tool for managing water quantity is the setting of minimum flows (limits to achieve the desired level of environmental protection).

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 or 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%.

We have a specific scientific study in the Pongakawa Stream 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 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 a river or stream. Mean Annual Low Flow (MALF) is a commonly used measure that describes the average amount of water expected in a river or stream 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 (by resource consents) more water than the total allocation limit, a 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 in the river or stream 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 rivers and streams, 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?

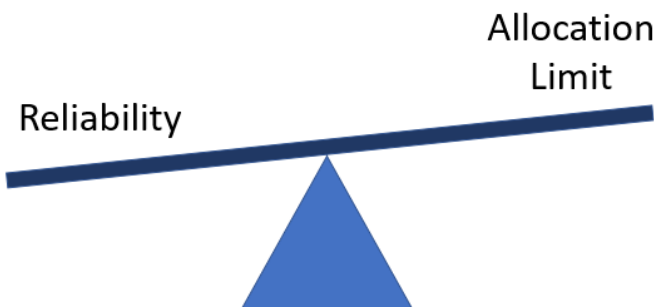
Water use

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 one in 5-year low flow. Based on this limit the key catchments of Pongakawa, Kaikōkopu, Oeuteheuheu and Whaere are over allocated.

Reliability is a measure of how often authorised water users have to stop or reduce their water take (because the river or stream is or would 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).

We've calculated the allocation limit by subtracting the minimum flow from MALF. This is called the primary allocation block and, depending on stream characteristics and the minimum flow, is usually quite reliable. On average, for spring fed streams in our region, a minimum flow of 90% MALF results in 14 days per year (and a range of up to 110 days) when no water is available to take. At a minimum flow of 80% MALF, the average days of no take reduce to two and range to 40 days.



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

Surface water in this catchment is heavily allocated for irrigation. The Pongakawa River and Kaikōkopu Canal are over allocated according to limits based on meeting trout habitat retention levels. However, trout are more important in the mid to upper catchment areas while takes are in the lower catchment. Also, as these streams are spring fed, they are more resilient to the effects of takes. Lower minimum flows would improve the reliability and availability of water, potentially with minimal effect on trout populations and no discernible effect on native fish.

There is only one scientific study and limited gauging information to inform the setting of minimum flows and allocation limits.

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

Surface water quantity options

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.

An alternative to setting the minimum flow (ecologic minimum flow) using trout and native fish habitat retention levels in the table above, is to meet the habitat protection level for native fish species and a lower habitat protection level for trout, which would reduce the minimum flow because trout prefer more flow than native fish species (alternative minimum flow).

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 minimum flow. Several catchments will be over allocated under this scenario because more than this amount of water is currently allocated in resource consents. The map on the following page shows the current allocation status using this option.

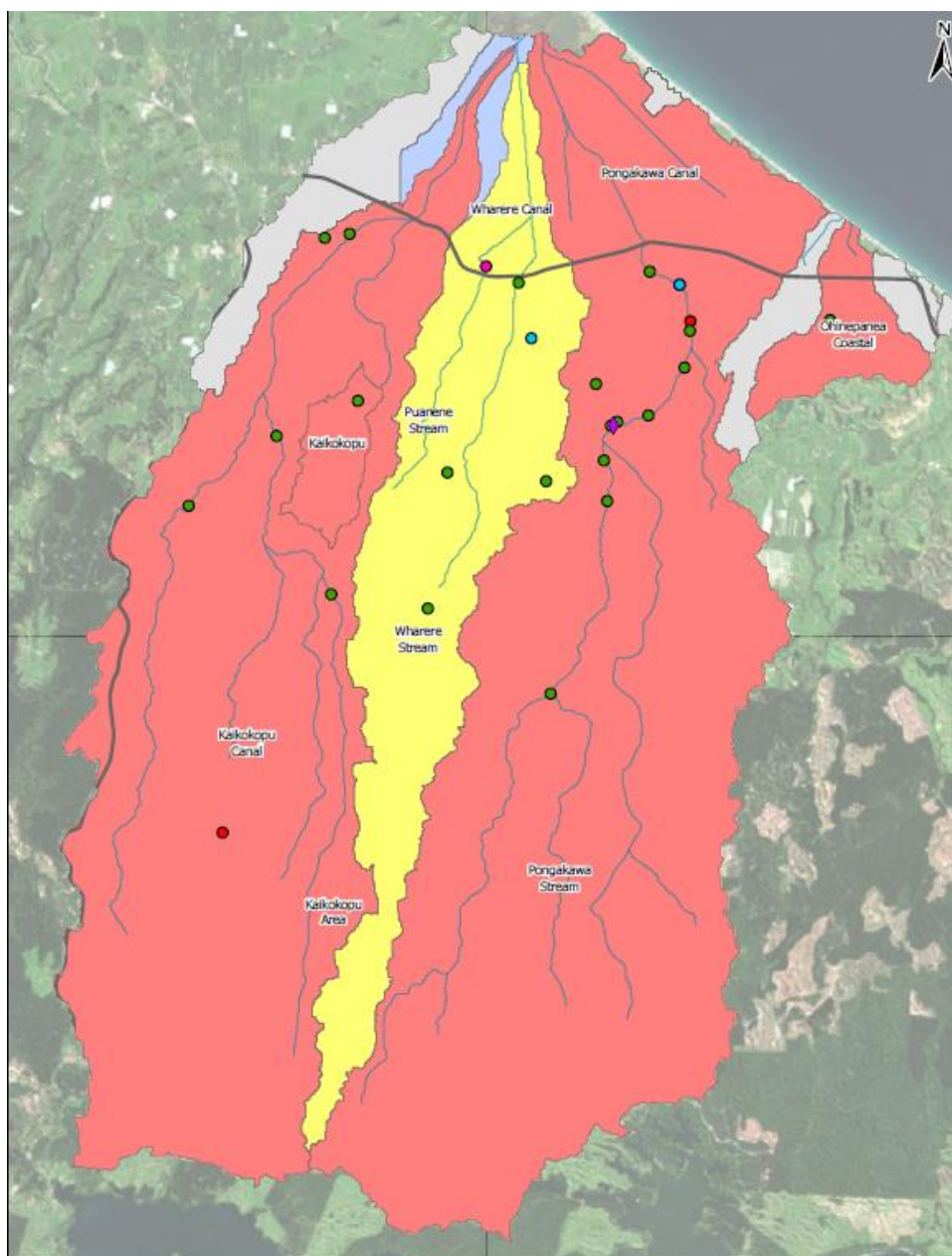
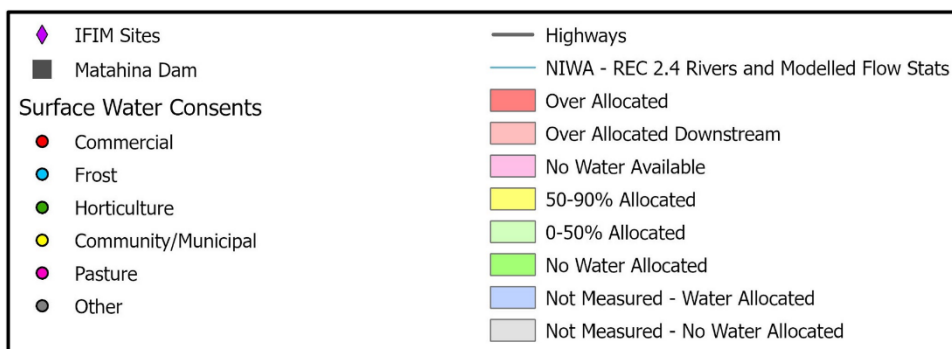
If the allocation limit is based on the ecologic minimum flow, the allocation limit (called the ecological limit in the graphs below) would mean several rivers and streams remain over allocated.

If an alternative allocation limit (called the alternative allocation limit in the graphs below) is based on the alternative minimum flow this would make more water available.

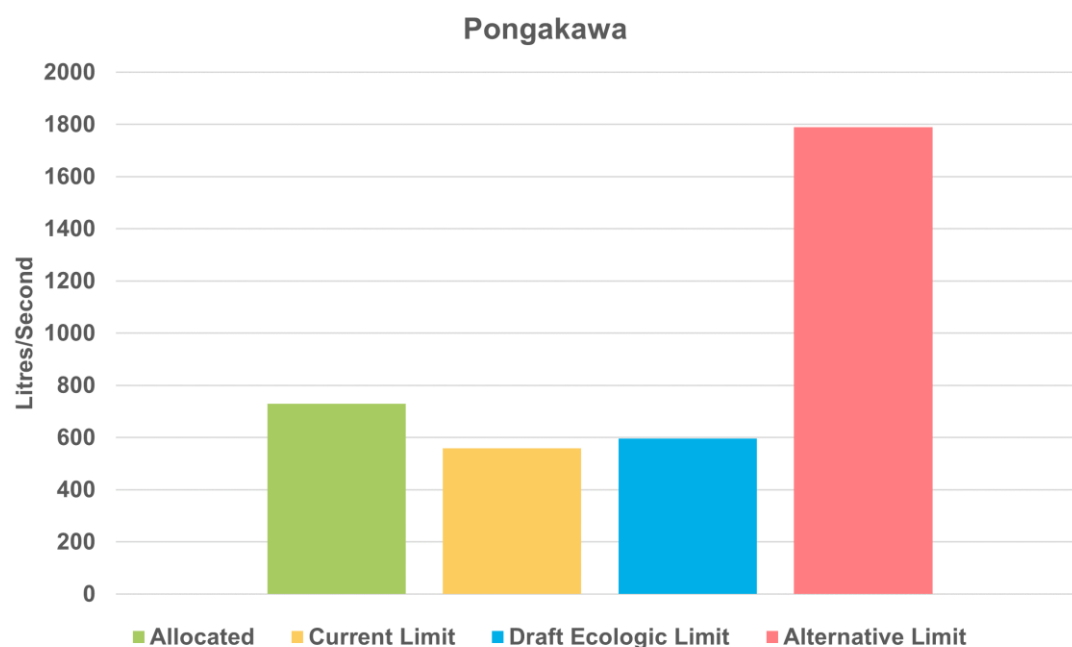
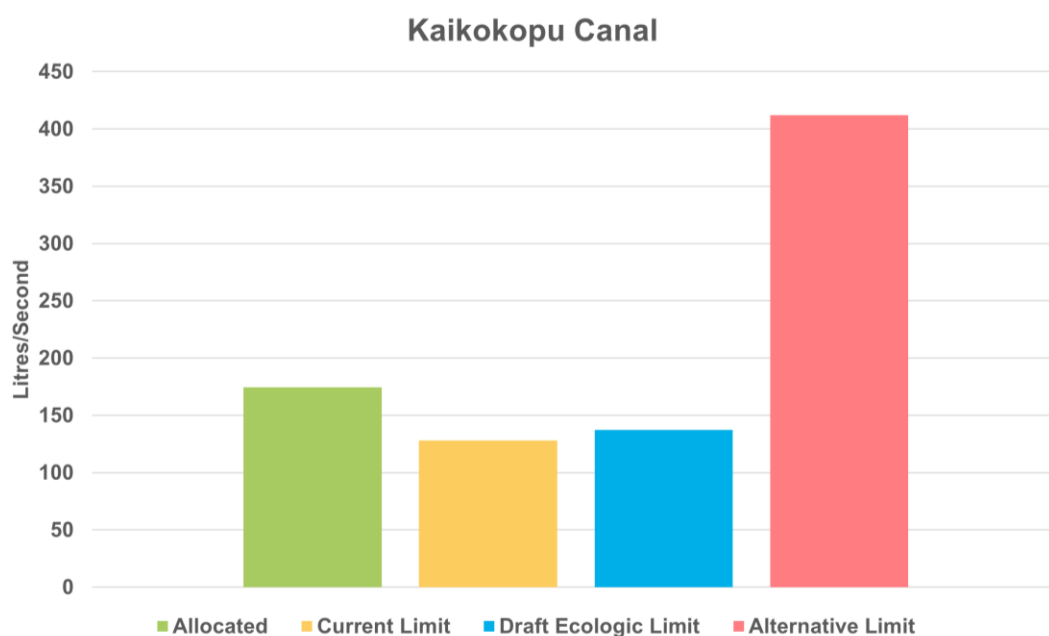
We could make the allocation limit even bigger, i.e., allocate more water relative to the minimum flow, but this will mean that people will be told to restrict or stop taking more often.

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. We are still investigating where this might be suitable, or how much extra water could be allocated, but it's likely that this option would better provide for current and future water dependant development if water storage dams are built.



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



Total water currently allocated to water users, current allocation limit (default allocable flow in the current Regional Plan), and draft ecological allocation limit (total allocable flow using the difference between the Mean Annual Low Flow and the ecological minimum flow).

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.

Within this FMU, there is sedimentary geology on the surface in the lowland areas. This area is also dominated by rocks of volcanic origin.

This group of water bearing aquifers are mainly comprised of river and estuarine sediments, volcanic tephra, post-glacial sand dunes, and alluvial (river) fans.

Issues

The currently consented groundwater abstraction of 16.8 M m³/year is equivalent to a depth of 47 mm/year over the FMU area (357 km²). At this level, groundwater abstraction may be reaching maximum acceptable limits, but this depends on how we manage the spread of water takes.

- There is a risk that salt water will move into groundwater near the coast if too much is water is taken near in the lowlands. This would ruin water quality for use.
- Groundwater is susceptible to the effects of land use and surface activities as the dominant source of recharge for this FMU is the land directly above the aquifers.
- Surface water in this FMU is over allocated so surfacewater allocation could be transferred to groundwater use.

Policy options

- Allocation limits will be set to protect river and stream base flows and avoid saline intrusion. These will be based on modelling scenarios that assess potential for these cumulative effects. Water availability will depend on how much effect on river and stream baseflow is deemed acceptable.
- Provisions that encourage use of groundwater to take pressure off potentially over allocated surface water catchments.
- 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 over allocated or not) calculated based on what is allocated and theoretically able to be used (not what is actually used).

Next steps for this FMU will be developing new Groundwater Management Zones within which allocation limits are set. In FMU this should result in a slightly simpler administrative arrangement with no significant impacts on existing users.

- 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.

boprc.govt.nz/freshwater

