

Glug  
Shpish  
Slosh

Water.  
We even love  
the way  
it sounds.



BAY OF PLENTY  
REGIONAL COUNCIL  
TOI MOANA

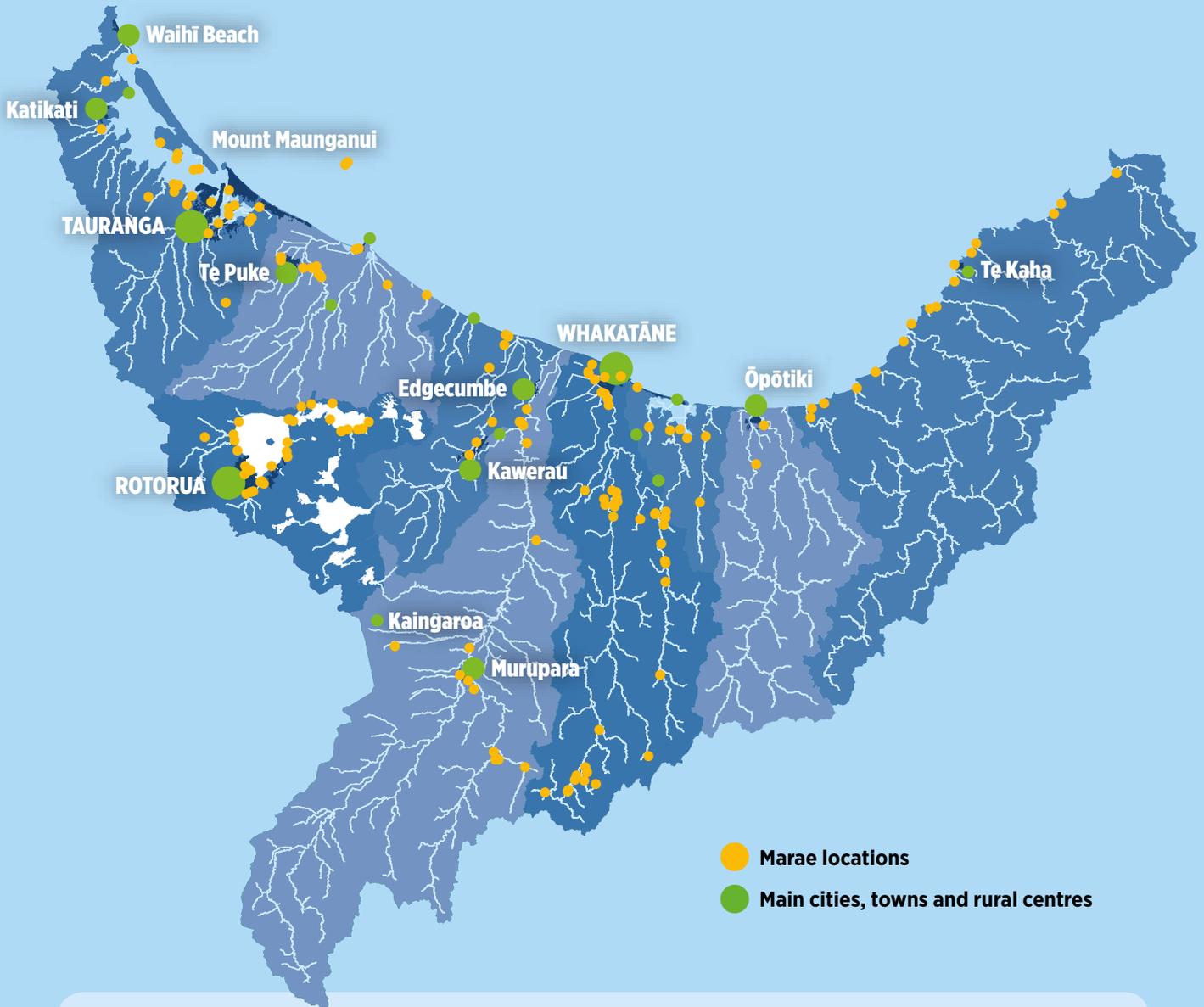
**O ngā taonga katoa o te whenua,  
ko te wai te mea tino  
ohooho o ngā mea katoa**

**Of all the treasures of the earth none is more precious than water**



# Te Mana o te Wai

Freshwater is vital for the health of people and communities.  
It is the lifeblood of our natural environment.



**The strong and inseparable connections between the health and wellbeing of water, people and the wider environment are described in te reo Māori (Māori language) as Te Mana o te Wai.**

In Te Ao Māori (the Māori world view), freshwater is intertwined with core values

such as whakapapa (genealogy), mana (authority, right, power), tapu (sacred or controlled), noa (common, open), tikanga (practice) and māuri (life force). These values anchor how Māori place themselves in the world, and help them to recognise the connections they have with the other living things and the environment.

# All water is connected

Water on the surface of the earth (surface water) such as from lakes, rivers and the ocean, evaporates into the air where it cools down and then falls as rain.

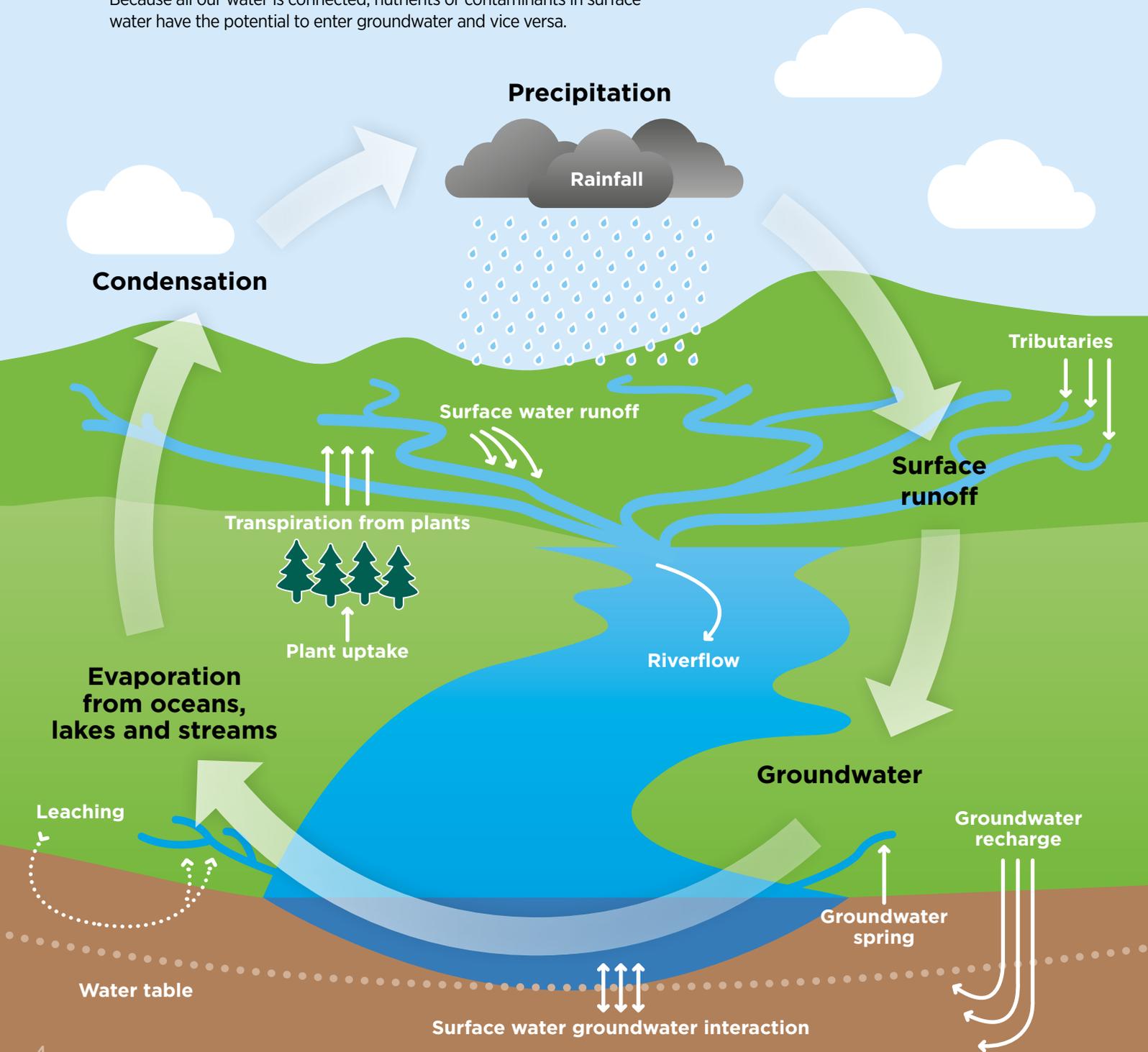
Rain either soaks into the ground and becomes groundwater, or flows over the land into lakes, rivers and streams.

Most surface water and groundwater then ultimately flows back out into the ocean where it will evaporate again.

What we do on land affects our rivers, streams, groundwater and sea.

As water moves around the land surface and through the ground, it transports contaminants like bacteria, sediment and nutrients.

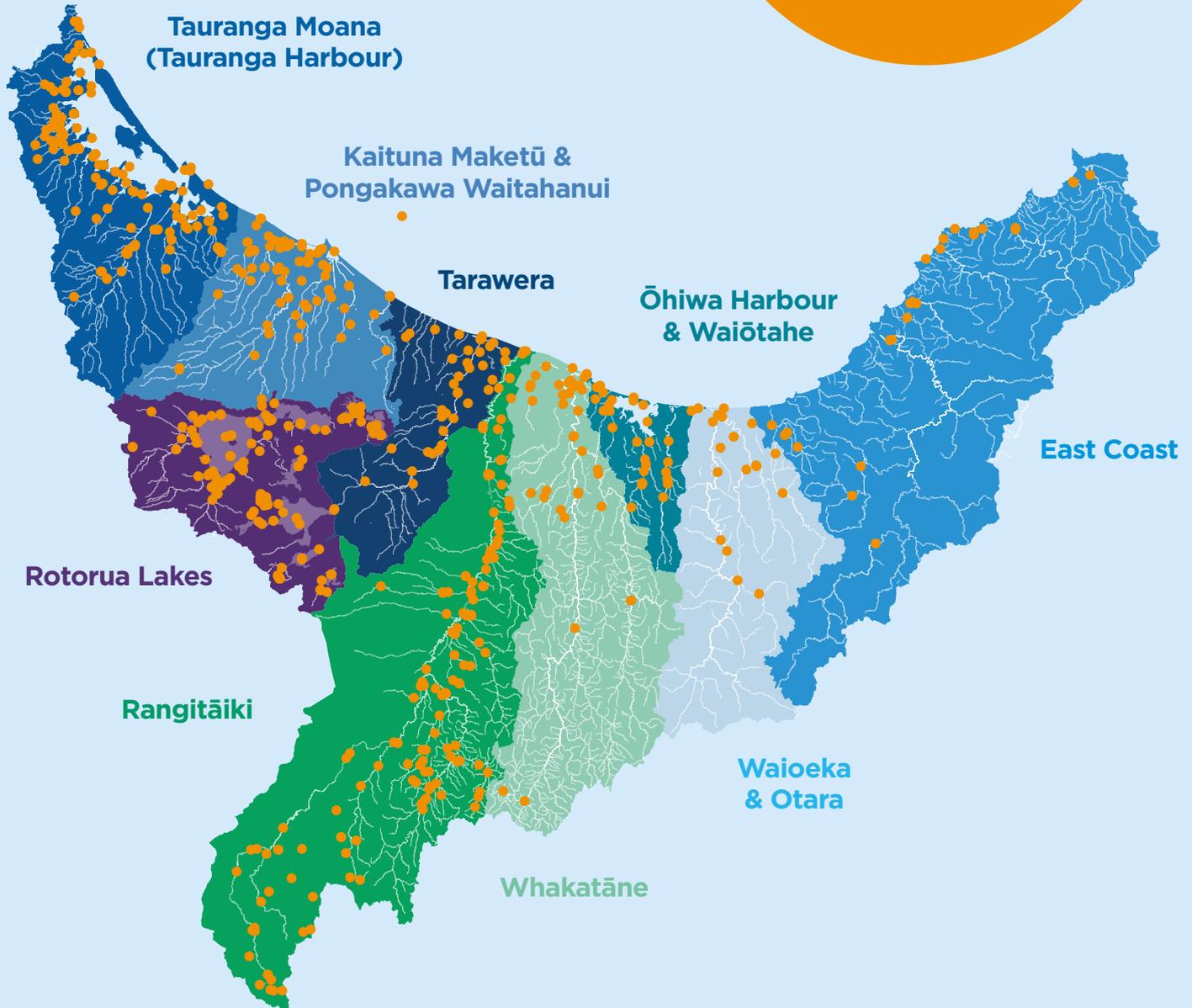
Because all our water is connected, nutrients or contaminants in surface water have the potential to enter groundwater and vice versa.



Drips, torrents, dribbles, rivers,  
streams, aquifers and lakes.

**We look after all kinds of water.**

**681**  
water  
monitoring sites  
across the  
Bay of Plenty region



Find out more about the scientific water information gathered  
by Bay of Plenty Regional Council from all these sites at  
[www.boprc.govt.nz/livemonitoring](http://www.boprc.govt.nz/livemonitoring) and [www.lawa.org.nz](http://www.lawa.org.nz)



# Regional Council's water role

Bay of Plenty Regional Council manages:

- water allocation: people's extraction of water for irrigation, industrial processing, electricity generation, drinking water (municipal supply) and other uses
- water quality in natural waterways, and
- habitat protection for freshwater wildlife.

Put simply, the Regional Council manages the natural freshwater that's in and on the ground, so that there's enough for people and wildlife to thrive, now and in the future.

Regional Council carries out scientific modelling and measurements to estimate the amount of water that enters and leaves waterways. We set aside the base amount needed to maintain water quality, support wildlife, and allow natural recharge of surface water (rivers and streams) and groundwater (aquifer) systems.

Our work is guided by national legislation, regulations and standards for water that prescribe public processes for setting requirements and rules. Central Government defines those through the Resource Management Act and National Policy Statements, as well as the Local Government Act which defines how our budgets are set and how we must conduct ourselves.

Regional Council has a responsibility to ensure that iwi can participate in the decision making processes of council. As Treaty settlements are completed, along with the latest amendments to the Resource Management Act 1991, the involvement of iwi in decision making will increase.

City and district councils are responsible for managing the infrastructure that enables water to be used and disposed of. This includes:

- Water treatment plants and piping to deliver water to taps in households and businesses in their supply area.
- Wastewater systems that remove water once it has been used.
- Stormwater systems to carry rainwater away.
- Managing the effects of land use such as through issuing consents to allow new buildings, infrastructure or increased traffic that might arise from commercial water use including new bottling plants or processing factories.

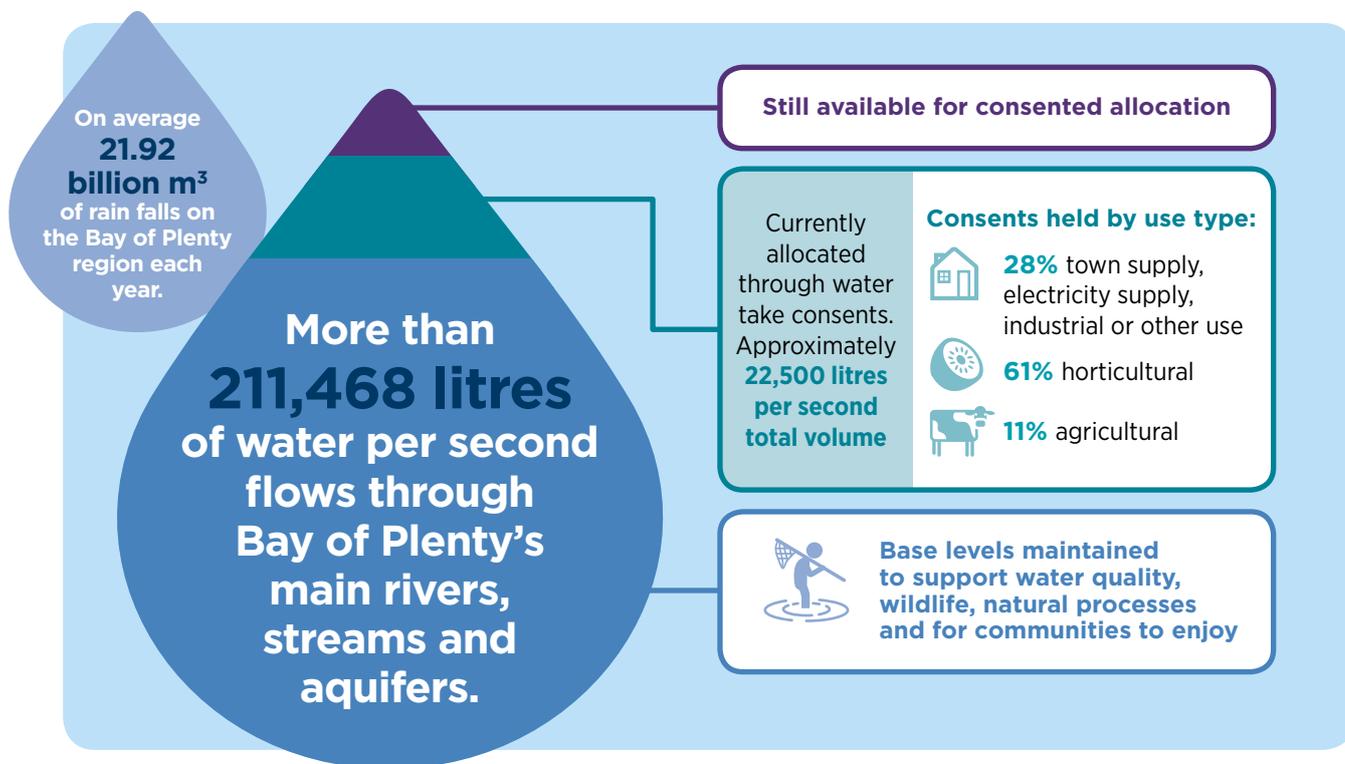
City and district councils are legally required to manage their responsibilities in a way that delivers on environmental objectives set by the Regional Council through its Regional Policy Statement and Regional Plans.



**We manage 1,300+ consents to take and use water from ground and surface water sources**

The total volume allocated to these consents is approximately 1.94 million m<sup>3</sup> per day (equivalent to 22,500 litres per second - similar to typical summer flows in the Tarawera River!)

# How our water is used



Anyone who wants to take a significant amount of water, or bore into an aquifer, must apply for a resource consent, and show how they'll avoid any environmental harm.

The Resource Management Act and the Regional Natural Resources Plan rules direct Regional Council to consider all consent applications from people wishing to take water for private, community or business benefit.

Most applications must be processed on a first in first served basis. Cultural values are required to be considered as part of the consent application process. Before approving a consent, Regional Council checks that:

- no serious environmental impacts will result
- sustainable minimum in-stream flows or aquifer recharge rates will still be maintained, and
- the water will be used efficiently (not wasted).

Often a water take consent-holder also needs to apply to their local city or district council for land-use consents, such as to build and operate industrial, processing or other facilities associated with their water-use activity.

Members of the public can influence water take consent rules by giving feedback on Regional Natural Resources Plan changes, or by making submissions on water take consent applications that meet public notification thresholds (see [www.boprc.govt.nz/consentnotifications](http://www.boprc.govt.nz/consentnotifications)).





There are two types of freshwater that the Regional Council is responsible for managing - surface water and groundwater.

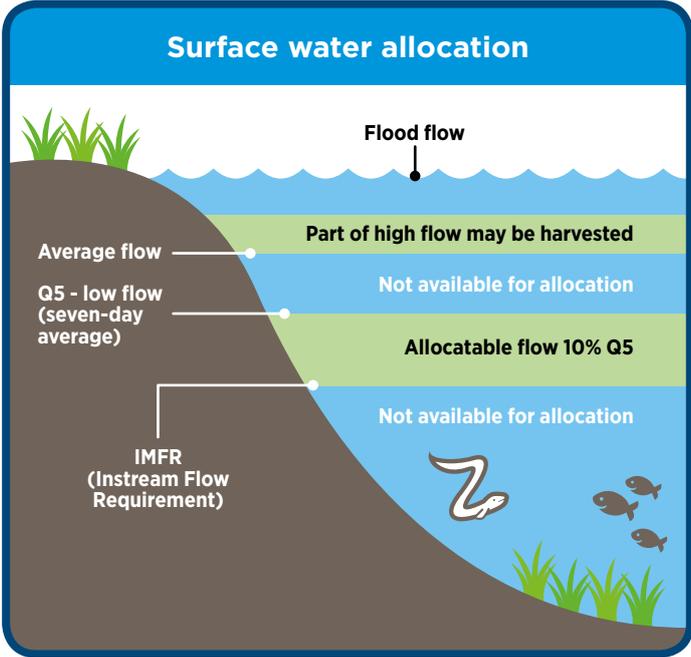
### Surface water

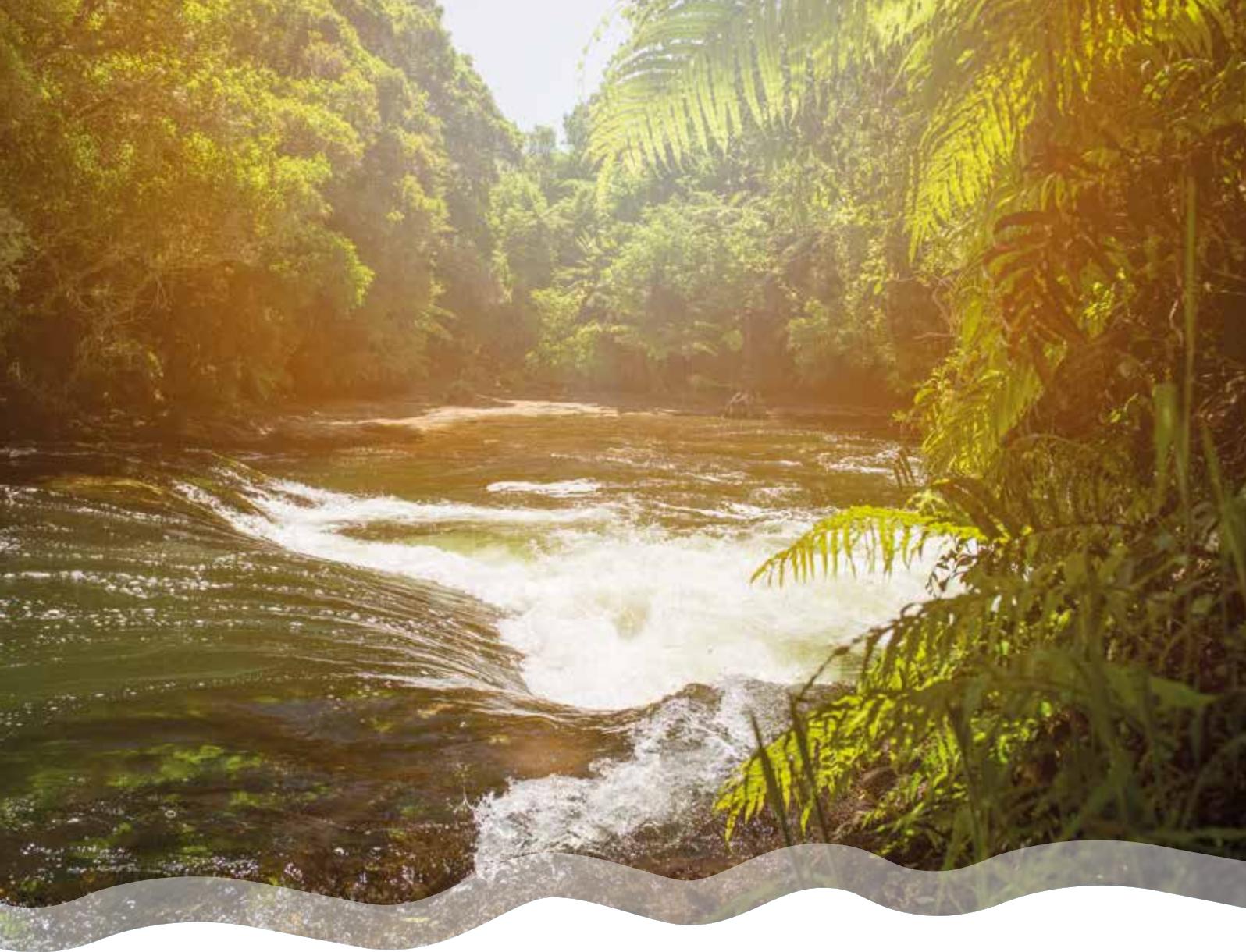
Surface water is all the water we can see, including: rivers, streams, lakes, drains, ponds, springs, and wetlands.

The diagram right shows how surface water (from rivers or streams) is allocated for use.

Scientists identify a low flow level for each waterway, called Q5. It's a seven-day average level that has a 20 percent likelihood of occurring in any one year. It's calculated from continuous monitoring and manual sampling data.

Generally ninety percent of that low flow (Q5) average is protected to support natural processes, leaving 10 percent of that amount available for people to use. High flows, above average levels may also be available for people to take.





## Groundwater

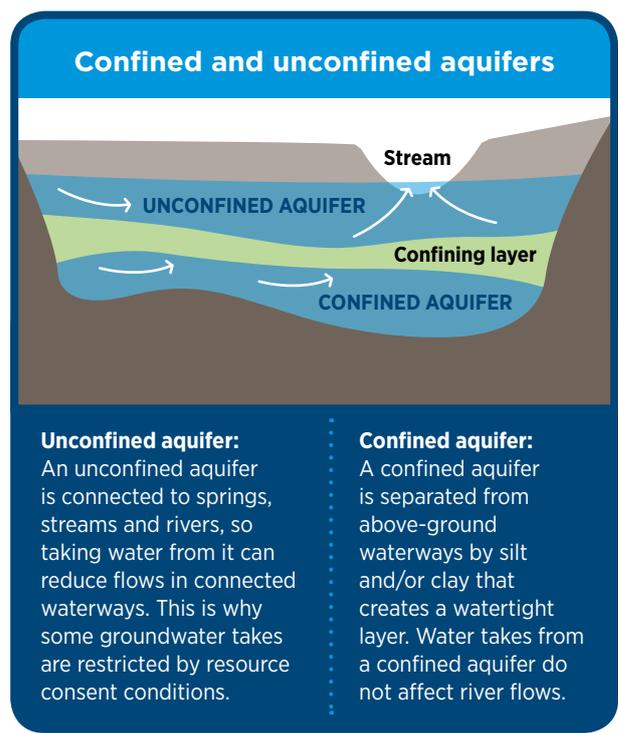
Groundwater is all the water contained below the earth's surface. It comes from rainfall and river water that percolates through the ground and accumulates in underground aquifers.

An aquifer is like a sponge, where water moves slowly through layers of gravel, sand and hard rock.

A minimum of 65 percent of groundwater flow is protected to maintain natural water quality and pressure in each aquifer. That means that a maximum of 35 percent of any remaining groundwater flow is then allocated as available for people's use.

Our aquifers have been studied for many decades and monitoring continues today.

Our Bay of Plenty groundwater monitoring network currently includes 54 **water level** monitoring bores and 22 bores that we collect **water quality** data from. We monitor rainfall and river water entering and leaving the aquifers, and people's consented use of groundwater and surface water.



# What's in the water?

Good water quality is clean water that we can use, swim, drink, and fish from. It keeps rivers and streams healthy so they can also support wildlife and thriving harbours downstream.

Good water quality is not always obvious. Clear water can contain unseen bacteria. Some murky water is safe but contains natural tannins, minerals or bottom-sediments that discolour it.

As well as monitoring water levels, flow and rainfall, the Regional Council uses a broad range of indicators to check and manage water quality across the region, and is scoping the use of mātauranga Māori (traditional knowledge) alongside western science.

## Our scientists look for:



### Nutrients: nitrogen (N) and phosphorus (P)

Excess nutrients encourage aquatic weed and algae growth, reducing dissolved oxygen levels and fish populations. Nutrients can come from a range of sources including fertilisers, agricultural sprays, uncontained waste dumping, animal urine and sewerage overflows. They can percolate through soil into groundwater or be flushed off the land into rivers and streams when it rains.



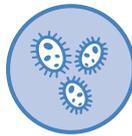
### Suspended solids and turbidity

High levels of soil run-off (sediment or suspended solids) can make water turbid (cloudy), raise water temperatures, and smother wildlife in waterways and estuaries. Poorly managed earthworks can increase suspended solids or turbidity levels. Hill country or stream bank erosion is another key contributor, often caused by stock traffic that loosens the soil in those sensitive areas.



### Temperature

Warm water temperatures (usually caused by lack of shading) can reduce dissolved oxygen and exacerbate aquatic weed and algae growth. Fish need cool (<math><20^{\circ}\text{C}</math>), well-oxygenated water to survive.



### Bacteria

Elevated levels of faecal bacteria (E.coli) from animal dung, human waste and water birds can make the water unsafe for people to swim or gather kai from. This is often used as a measure of 'swimmability'.



### Stream health using the Macroinvertebrate Community Index

The type and number of macroinvertebrates (including insect larvae, crustacea and small shellfish) that live in a waterway is used to describe its ecological health. A high Macroinvertebrate Community Index (or MCI) generally shows that the stream can support healthy populations of fish and other wildlife.



# Ko te wai te ora o na mea katoa

## Water is the life giver of all things

For Māori, the deep kinship between people and the natural world creates an obligation to care for the environment and maintain it for future generations. This obligation is expressed as kaitiakitanga – the cultural practice of guardianship and environmental management, grounded in mātauranga Māori (Māori systems of knowledge).

Mātauranga Māori recognises that the mauri (life force) in a water body, or the absence of mauri, influences its characteristics.

The health and abundance of mahinga kai (food sources) and taonga (treasured) species such as tuna (eels), koura (freshwater crayfish), whitebait, watercress, can be a key indicator that a waterway and the people it supports are healthy and well cared for.

'Wai' is the te reo Māori word for water and these names apply to different types of water:

- **Wai-ora** (pure water)
- **Wai-māori** (freshwater)
- **Wai-kino** (polluted)
- **Wai-mate** (dead water)
- **Wai-tai** (saltwater or water from the ocean)
- **Wai-ariki** (hot springs or curative waters)



# Freshwater futures

Through the National Policy Statement for Freshwater (NPS), Central Government has directed Bay of Plenty Regional Council to improve the way that water is managed in the region so that:



Our lakes, rivers, streams, wetlands and the estuaries they flow into are kept healthy for people to enjoy.



Water allocation decisions are well informed, sustainable, efficient and based on agreed limits.



Te Mana o te Wai (the unique relationship iwi have with freshwater) is recognised and protected.



Native plants and animals can thrive in healthy freshwater habitats.

## There are many challenges in maintaining and protecting our water

In the Bay of Plenty it often seems like we have lots of water, but even now, in some places and at some times, we don't have enough water for everyone who wants to use it.

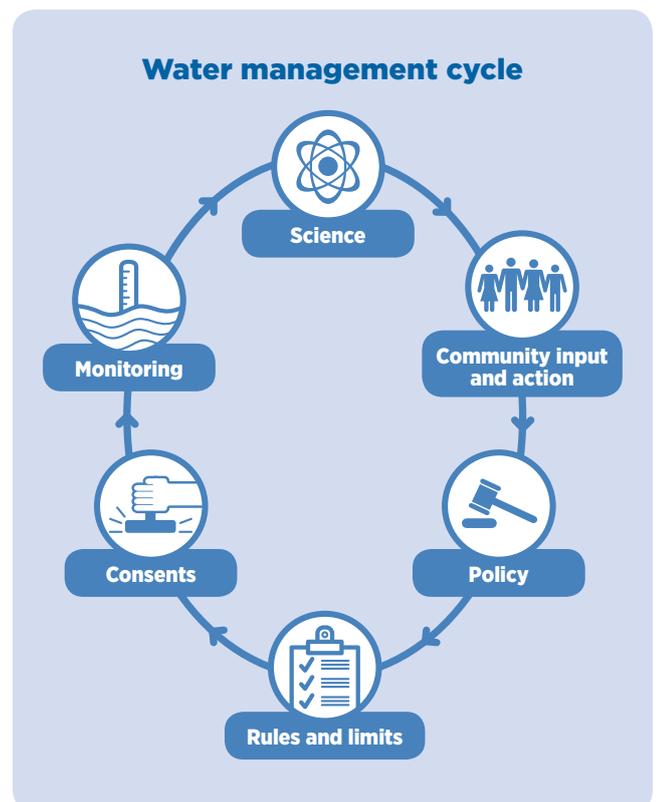
The future suggests more water is needed – our population is growing and water supports our region's economic development. Our key industries are land-based and depend on water to grow. A 2011 study predicted that within 50 years water demand in the western Bay would double.

### What we need to do

We're looking at the balance between how much water is left in the natural environment and how much is used. We want to ensure that the right amount is allocated for use and that water isn't wasted.

We also need to work together with iwi, community and industry, on water quality that sustains us all, both now and in the future.

Council's decisions about rules and consenting are based on the best available information at the time. We're continually improving our water management approach based on iwi and community feedback, new science, and water use information we gather.



# We all care deeply for water

**The Bay of Plenty's water quality and availability is generally good but it's under increasing pressure and needs improvement in some locations.**

Bay of Plenty Regional Council invests more than \$30 million each year on work with local people to improve and protect the water in local rivers, lakes, streams and aquifers.

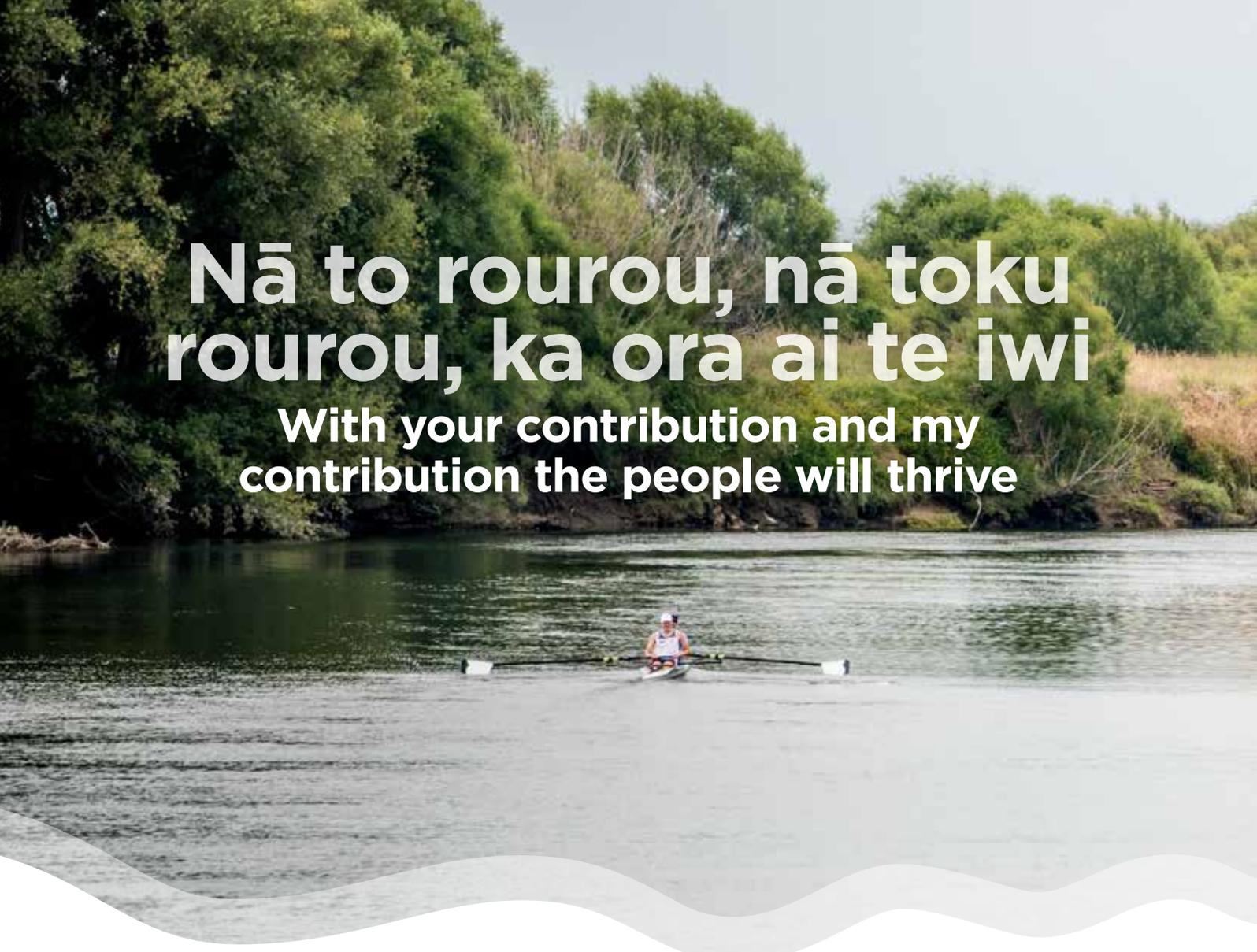
**That delivers work on the ground with land, business and infrastructure owners alongside iwi and the wider community to:**

- reduce pollution and respond to spills
- fence and replant waterway margins
- restore wetlands, remove fish barriers and enhance wildlife habitat
- control erosion and trap sediment
- develop new tools for reducing bacteria and nutrient run-off
- use science to detect environmental changes and solve complex problems
- sustainably manage people's use of land and water through rules and resource consents
- maintain stop banks and flood protection schemes to protect towns and rural land from river overflows.

**We're also taking a two-step approach to improving the rules for water quality and quantity management in the region by:**

1. Strengthening water allocation limits through a Region-wide Water Quantity Plan. Public submissions were received in December 2016. Hearings are scheduled for October 2017 and the new rules may be operative by March 2018. See [www.boprc.govt.nz/waterquantity](http://www.boprc.govt.nz/waterquantity) for updates.
2. Working with communities to set limits at a localised level to meet water quality and quantity targets for specific areas and waterways (Freshwater Management Units) by 2025. This is under way in the Kaituna Maketū, Pongakawa Waitahanui and Rangitāiki catchments. It will roll out to other parts of the region in the coming years. This is part of our efforts to implement Central Government's National Policy Statement for Freshwater. See [www.boprc.govt.nz/freshwaterfutures](http://www.boprc.govt.nz/freshwaterfutures) for updates.





# Nā to rourou, nā toku rourou, ka ora ai te iwi

With your contribution and my contribution the people will thrive

## It's everyone's role to care for the waterways that sustain us

### Regional Water Advisory Panel

This panel was established by Regional Council and is made up of representatives from Māori, environmental, economic development, energy, forestry, agricultural and tourism sectors. Their expertise and advice brings a broad range of perspectives to the way our region's freshwater is managed.

### Community groups

Community reference groups have been established for the Kaituna Maketū, Pongakawa Waitahanui and Rangitāiki catchments (also known as Water Management Areas) to inform the development of localised changes to the Natural Resources Plan.

Similar groups will be established in other parts of the region in the coming years. Draft plan changes will be consulted on with the wider public from 2018.

### Landowners and residents

We have many passionate local groups and individuals that work hard to protect, restore and clean-up wetlands and waterways. Everyone can help by:

- Preventing and reporting pollution at work, home and play,
- Making changes on their properties to reduce erosion, bacteria and nutrient run-off, and
- Taking time to provide input into council processes and making submissions on council plans.



## Iwi and hapū

In our region we have 37 Iwi, more than 200 hapū, and 224 marae.

As kaitiaki (custodians) who have a long historical connection to freshwater bodies, iwi have an important role in guiding water management so that everyone can continue to enjoy and use healthy waterways.

Many Iwi and hapū have management plans in place that outline the cultural values and interests of local tangata whenua that must be considered in water management and resource consent decisions.

Through treaty settlement legislation, co-governance forums are also being established. Through these forums, appointed Iwi or hapū members work alongside local government representatives, to ensure tangata whenua are involved in decision-making processes.

## Co-governance forums

The Rangitaiki River Forum and Te Maru o Kaituna are examples of local co-governance forums that have been established by law in the Bay of Plenty. These forums have the ability to influence the Bay of Plenty Regional Policy Statement (and associated water management rules) through the river documents they produce.

The purpose of Te Maru o Kaituna River Authority (established under the Tapuika Claims Settlement Act 2014), is to promote the restoration, protection and enhancement of the environmental, cultural and spiritual health and well-being of the Kaituna River. One of the key functions of Te Maru o Kaituna is to develop and approve the Kaituna River Document which is due for completion in 2018.

The Rangitaiki River Forum was formed in May 2012 by law to protect and enhance the mauri (life-giving capacity) of the Rangitaiki River and its tributaries. The Rangitaiki River Forum approved “Te Ara Whanui o Rangitaiki - Pathways of the Rangitaiki” on 16 December 2014. The Rangitaiki River Document is all about our aspirations for the River and ensuring a healthy River for the benefit of present and future generations.

# What's happening in your area



## Tauranga Moana (Tauranga Harbour)

- 89.5 percent of waterways are now protected from farm animals.
- Two community sewerage reticulation schemes funded to replace septic tanks at Te Puna West and Ongare Point.
- 16 sub-catchment action plans being implemented in partnership with iwi and local councils.

[www.boprc.govt.nz/taurangaharbour](http://www.boprc.govt.nz/taurangaharbour)



## Rotorua Lakes

- 100 percent of waterways in eight Rotorua lakes sub-catchments excluded from stock. More than 85 percent protection achieved in the remaining four sub-catchments.
- Developing new tools to reduce in-water nutrients, including alum dosing trials and wetland installations, land-use conversions and large scale gorse removal.
- Community-led targets set and being worked towards in partnership with Te Arawa Lakes Trust, and Rotorua Lakes Council.
- New nutrient reduction rules for Lake Rotorua being progressed through Proposed Plan Change 10 to the Regional Water and Land Plan.

[www.rotorualakes.org.nz](http://www.rotorualakes.org.nz)

## Tauranga Moana (Tauranga Harbour)

## Kaituna Maketū & Pongakawa Waitahanui

## Tarawera

## Rotorua Lakes

## Rangitāiki



## Nine Water Management Areas

These nine areas give us practical geographic units for managing freshwater in the Bay of Plenty. They're based on a range of factors, including physical surface catchments, iwi cultural boundaries, Treaty settlement, major project areas and where people live. But that doesn't mean there won't be some border crossing when required. Water doesn't necessarily stay within a boundary, so there will be times when we won't either.



### Kaituna Maketū & Pongakawa Waitahanui

- Restoring 20 percent of the Kaituna River's freshwater flow back into Te Awa o Ngatoroirangi/Maketū Estuary and re-creating 20 hectares of wetland.
- Supporting Te Maru o Kaituna River Authority to guide protection and restoration of the River through development of the post-treaty settlement Kaituna River Document, due for completion in 2018.

[www.boprc.govt.nz/kaitunamaketu](http://www.boprc.govt.nz/kaitunamaketu)



### Rangitāiki

- Stock excluded from 78 percent of pastoral waterway margins in the catchment.
- Delivering on Rangitāiki River Forum (a treaty settlement entity) goals for a healthy river that supports people's wellbeing, kaimoana including tuna (eels) and ancestral connections.
- Improving tuna (eel) habitat and access through Rangitāiki waterways and hydro-dams in partnership with iwi.

[www.boprc.govt.nz/rangitaiki](http://www.boprc.govt.nz/rangitaiki)



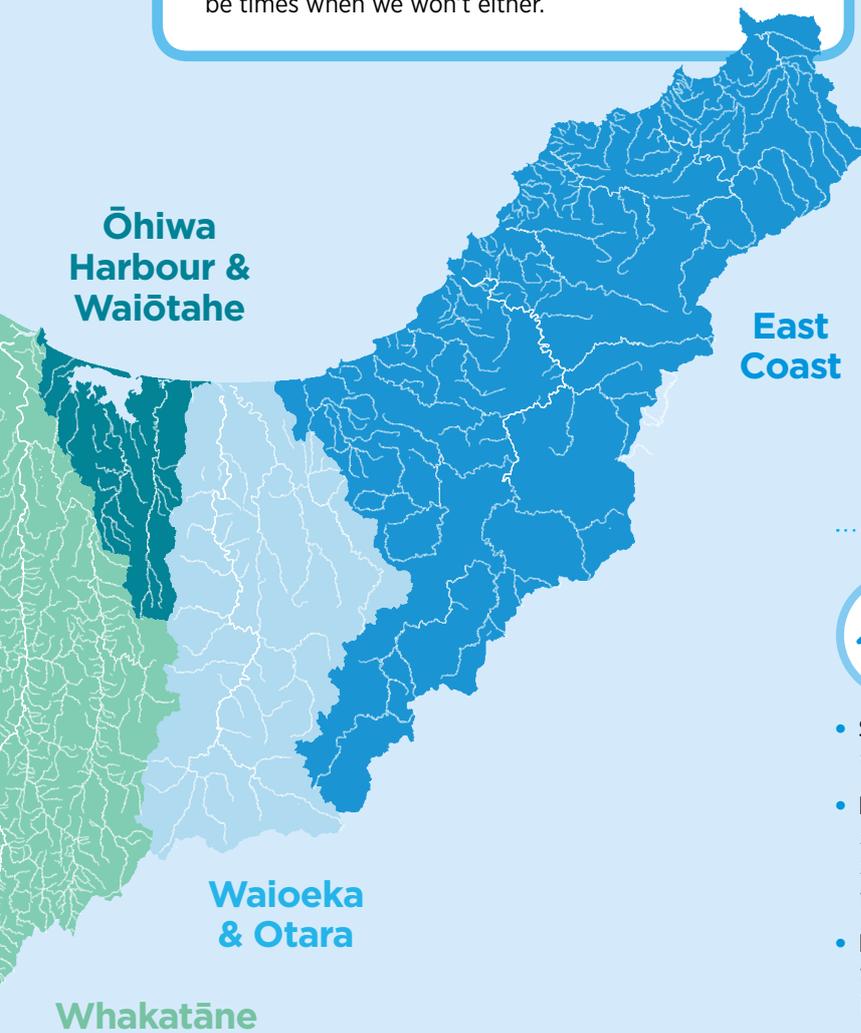
### Other Eastern Bay Catchments

- Contaminated site clean-ups at Kopeopeo Canal and Orini Stream.
- Industrial discharges reduced in Tarawera Catchment.
- Tarawera River Catchment Plan operative since 2004.



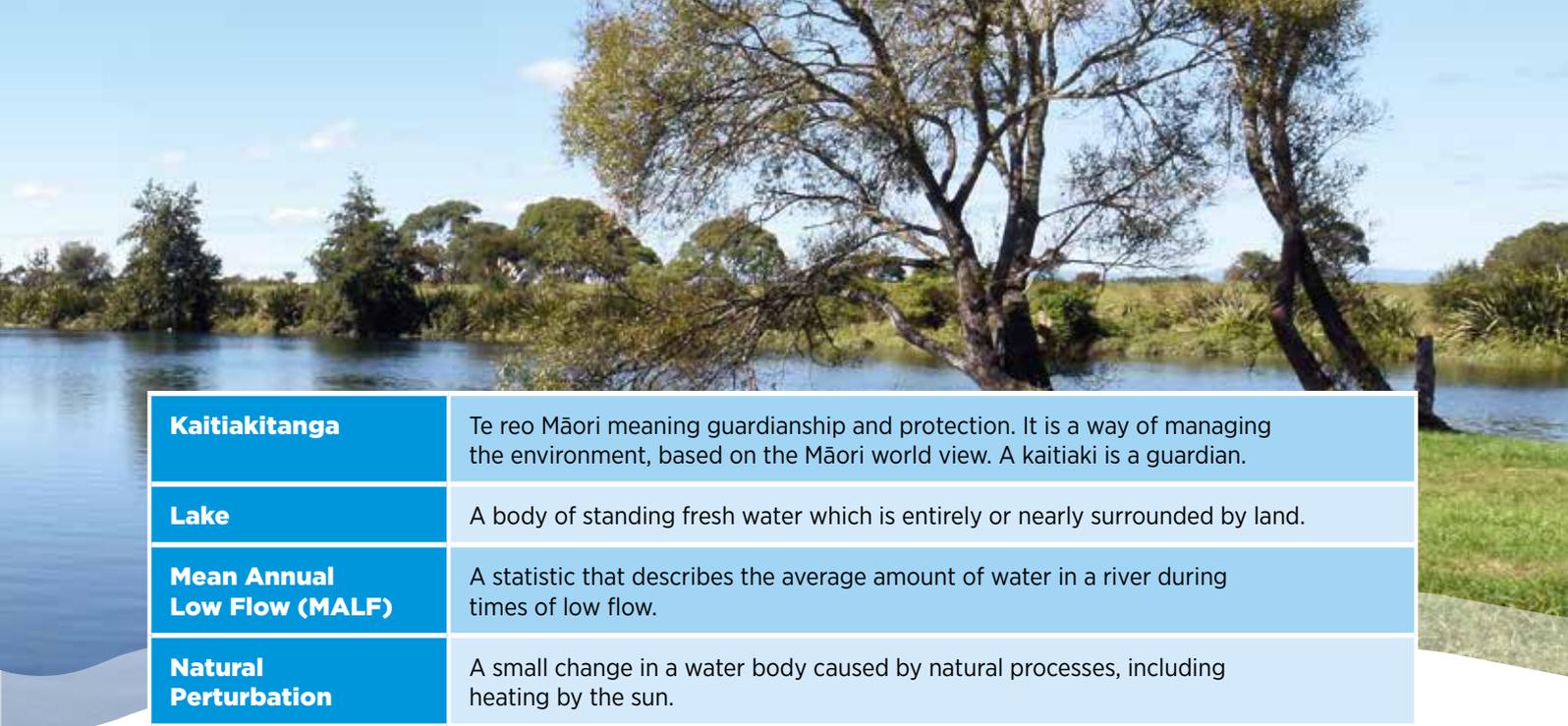
### Ōhiwa Harbour & Waiōtahe

- 95 percent of waterways have been protected from stock access.
- Delivering on the Ōhiwa Harbour Strategy with iwi and council partners to reduce sediment, care for wildlife and kaimoana, and restore the harbour and catchment.

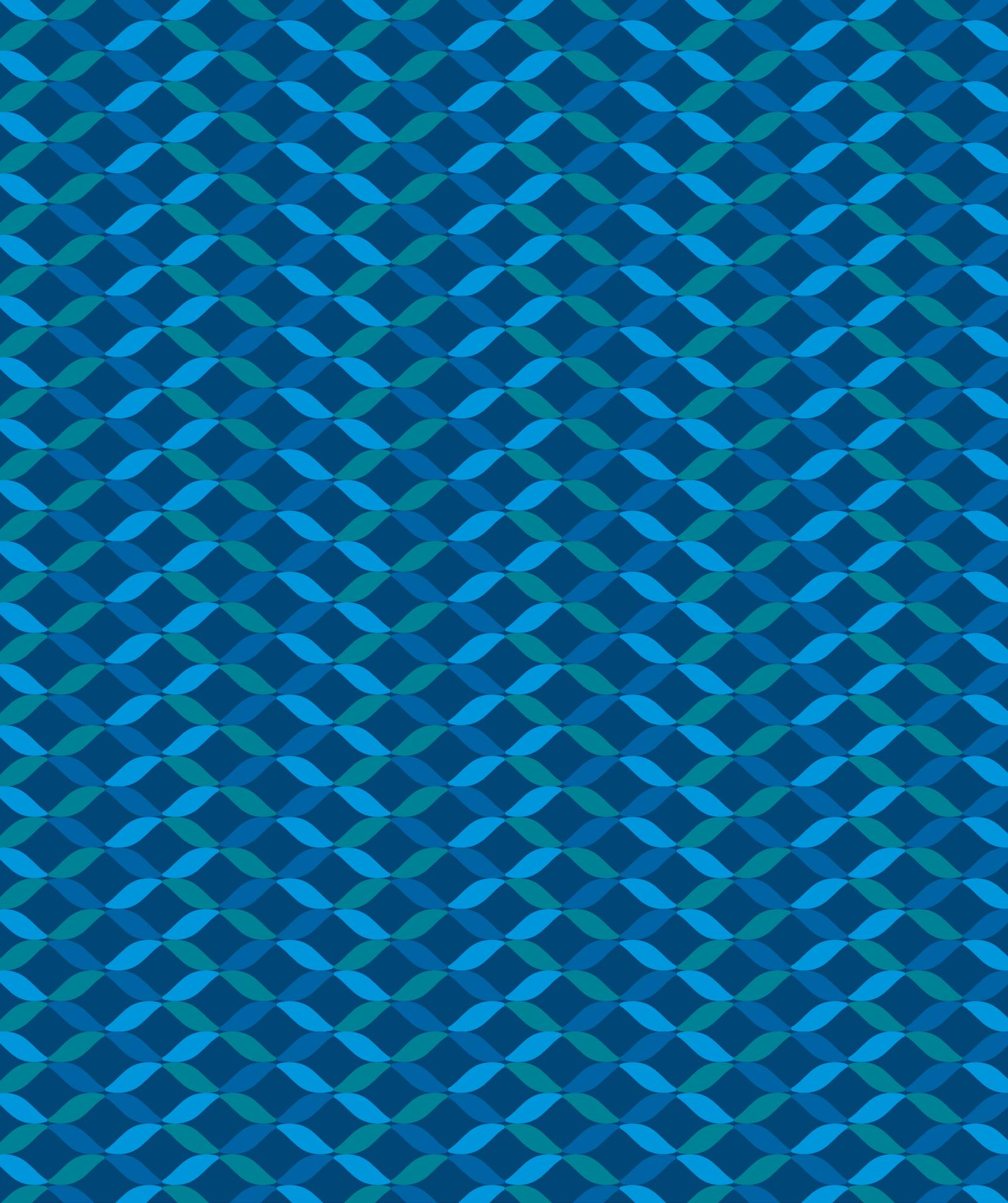


# Glossary

<b>Abstraction</b>	The act of taking water from a river, stream, lake, aquifer or other water body.
<b>Aquifer</b>	An underground layer of rock or soil that can store large quantities of water (groundwater). An aquifer may be confined or unconfined. An unconfined aquifer is connected to springs, streams and rivers. A confined aquifer is sealed above and below by impermeable material (silt or clay) which separates it from above-ground waterways.
<b>Berm</b>	The land area between the bed of a river and the crest of a stop bank.
<b>Bore</b>	Any structure or hole in the ground which is drilled or constructed for the purpose of accessing, taking or using groundwater.
<b>Catchment</b>	A catchment is an area of land where the surface water (such as rivers, lakes and streams) and groundwater all flows into one particular water body like a major river or estuary. May also be referred to as a watershed.
<b>Culvert</b>	A pipe in the bed of a stream, river or modified waterway that conveys water underneath a path, road or track.
<b>Drain</b>	An artificial channel or waterway used for land drainage purposes, such as to lower the water table or carry away storm water.
<b>Estuary</b>	A partially enclosed coastal body of brackish water with one or more rivers or streams flowing into it, and with a free connection to the open sea.
<b>Floodplain</b>	A low area of land adjacent to a river, stream or other waterway which is subject to flooding and holds the overflow of water during a flood.
<b>Freshwater</b>	All water except seawater or geothermal water.
<b>Geothermal water</b>	Water that's heated within the earth by natural phenomena to a temperature of 30 degrees Celsius or more. Includes all steam, water, water vapour, and every mixture of all or any of them that has been heated by natural phenomena.
<b>Groundwater</b>	Water that is found beneath the land surface in rock, sand or soil. Groundwater accumulates in underground aquifers.
<b>Heritage values</b>	Includes natural character, outstanding natural features and landscapes, indigenous vegetation and habitat of indigenous fauna, Māori cultural values, heritage values and places, and ecosystem, landscape and amenity values.
<b>Hydrology</b>	The study of the mechanics of surface water, groundwater and flow.
<b>Intermittent watercourse</b>	A waterway that: <b>(a)</b> flows for most of the year or is only dry for short periods of the year, and during such dry periods has stable pools or 'wet patches'; and <b>(b)</b> has a defined water channel and banks; and <b>(c)</b> connects with a permanently flowing surface water body; and <b>(d)</b> provides habitat for aquatic flora and/or fauna species.
<b>Instream Minimum Flow Requirement (IMFR)</b>	The base flow of water in a river or stream necessary to sustain aquatic life, water quality, recreational use, outstanding natural features or Māori cultural values.



<b>Kaitiakitanga</b>	Te reo Māori meaning guardianship and protection. It is a way of managing the environment, based on the Māori world view. A kaitiaki is a guardian.
<b>Lake</b>	A body of standing fresh water which is entirely or nearly surrounded by land.
<b>Mean Annual Low Flow (MALF)</b>	A statistic that describes the average amount of water in a river during times of low flow.
<b>Natural Perturbation</b>	A small change in a water body caused by natural processes, including heating by the sun.
<b>Permitted Activity</b>	Means an activity described in section 77B(1) of the Resource Management Act.
<b>Riparian area, margin or strip</b>	An area of land, usually of varying width, that is directly adjacent to a waterway and which contributes to maintaining and enhancing the natural functioning, quality, and character of the waterbody.
<b>River</b>	A large natural stream of water flowing in a channel to the sea, a lake, or another river. May include a stream or modified waterway; but does not include any artificial waterway (such as an irrigation canal, water supply race, canal for the supply of water for electricity power generation, or farm drainage canal).
<b>Stop bank</b>	A barrier or embankment constructed near or alongside a river, and designed to contain flood flows and prevent high river flows flooding onto adjacent land.
<b>Tributary</b>	A stream that drains into a larger stream or river, or into a lake or wetland, thereby contributing water to it.
<b>Trophic Level Index (TLI)</b>	A numeric system used in New Zealand as a measure of nutrient status and associated ecological health of lakes. It measures four indicators: water clarity, chlorophyll content, total phosphorus and total nitrogen. The TLI number increases as water quality decreases.
<b>Water allocation</b>	The amount of water made available for a particular purpose or use. Water allocated through a resource consent is usually expressed as a maximum daily limit in cubic metres (m <sup>3</sup> ). A maximum pumping or abstraction rate may also apply. The amount of water available for consented allocation depends on: <ul style="list-style-type: none"> <li>• How much water is available and already allocated in the catchment</li> <li>• The current state (health) of the source water body</li> <li>• Other values and uses that the water body supports (eg. wildlife, recreational and cultural needs).</li> </ul>
<b>Water harvesting</b>	Taking and storing surface water for future use.
<b>Water meter</b>	A device that records how much water is being taken or used.
<b>Water quality</b>	The 'health' of freshwater, defined by its physical, biological, and chemical properties, as well as other attributes valued by users (such as its aesthetic value).
<b>Water table</b>	The level at which land becomes saturated with groundwater.
<b>Waterway or water body</b>	A natural (such as a stream, river, wetland, lake, or aquifer) or constructed area (such as a pond, drain or channel) where water pools or flows.



This booklet was produced by Bay of Plenty Regional Council for World Water Day 2018. Sign up to receive our water e-newsletter, or find out more on the work we are delivering at [www.boprc.govt.nz/freshwaterfutures](http://www.boprc.govt.nz/freshwaterfutures)

