Setting our Direction

for improving freshwater in Tāmaki Makaurau / Auckland

AK HAVE YOUR SAY

National Policy Statement for Freshwater Management Auckland consultation document, November 2023



Auckland Council
Te Kaunihera o Tāmaki Makaurau

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1. Purpose of this engagement/ kōrerorero

The National Policy Statement for Freshwater Management (NPS-FM) is a government policy that sets the direction for how freshwater should be managed across New Zealand. It applies to all freshwater bodies, including rivers, streams, lakes, wetlands, aquifers (groundwater), and springs. It also includes consideration of how freshwater affects coastal environments and the foreseeable impacts of climate change.

The current version of the NPS-FM was released in 2020, and amended in February 2023. To give effect to this new national direction in Tāmaki Makaurau, Auckland Council needs to amend the Auckland Unitary Plan (AUP) by 31 December 2024, and develop action plans to achieve the outcomes we have identified.

There are many decisions to be made, including setting targets and limits for measures of freshwater quality and quantity and introducing provisions into the Auckland Unitary Plan to manage activities accordingly. These decisions will affect water-related activities in the region, including how we use and develop land where it has an impact on freshwater.

Ambitious expectations

The NPS-FM is part of the Government's Essential Freshwater package which aims to:

- stop further degradation of our freshwater
- start making immediate improvements to water quality within five years
- reverse past damage to bring our waterways and ecosystems to a healthy state within a generation.

The NPS-FM requires us to be ambitious, but reasonable, in improving the health of freshwater within a generation.

Some of the freshwater issues we need to improve are 'wicked problems', meaning they are complex and interdependent, with no simple solutions. These issues, like the nitrates in shallow Pukekohe groundwaters and the zinc in urban streams will take more than a generation to resolve.

Alignment with regional strategies

While the core purpose of this work is to implement the NPS-FM, we will also be taking into account existing council strategies relevant to freshwater management in the Auckland region. Two of the key sources of policy direction for Tāmaki Makaurau's freshwater management are the Auckland Water Strategy 2022 (Te Rautaki Wai a Tāmaki Makaurau) and Te Tāruke-ā-Tāwhiri: Auckland's Climate Plan. The plan change and action plans arising out of the NPS-FM will support us to implement these strategies.

Other legislative reform or engagement activity

This consultation is focused on the actions required to implement the NPS-FM. While the decisions made here will have an impact on the delivery of water services, including drinking water, wastewater and stormwater, this consultation does not directly consider the Water Services Reform process that is currently underway. The new entity will be required to meet the statutory obligations of the NPS-FM, including any plan changes that Auckland Council introduces.

Similarly, this NPS-FM engagement is quite separate from the central and local government response to severe storm events. Auckland Council has recently been consulting with the community on approaches to make the region more resilient to flooding. This is a separate programme, as part of Auckland's broader Recovery programme.

In this document

In part one of this document, we set out the reasons for change: the state of Tāmaki Makaurau's freshwater, and the national direction given in the NPS-FM.

In part two, we introduce the direction we want to take: establishing three Freshwater Management Units for the region, and setting out the proposed visions, values and environmental outcomes. We also identify areas where special management provisions are required.

In part three, we look at the baseline state for water quality. We do this through the lens of a series of measures (known as 'attributes') that set a benchmark in time, describing what it was like in our rivers and lakes in 2017. The baseline state will help us to establish targets and evaluate progress over time.

In part four, we consider targets and methods to get us to our goals. This includes setting targets for the freshwater attributes that we need to manage, and identifying the regulatory and non-regulatory methods we could use. This section sets out our proposed direction, with more detail to come next year. Although we have many decades of environmental monitoring for Tāmaki Makaurau, the NPS-FM requires us to monitor new water quality measures before we can finalise our proposals for targets. We'll have more of this information ready before the plan change is notified in 2024.

Finally, in part five, we discuss the decisions we'll need to make about water quantity management.

The purpose of this engagement document is to share with you the progress we have made so far and to hear what you think about the direction we are proposing. The results of this engagement will inform proposed changes to the Auckland Unitary Plan that we anticipate releasing in late 2024. We welcome your feedback.







Part one: Reasons for change

◀ Hoteo River water level gauging site

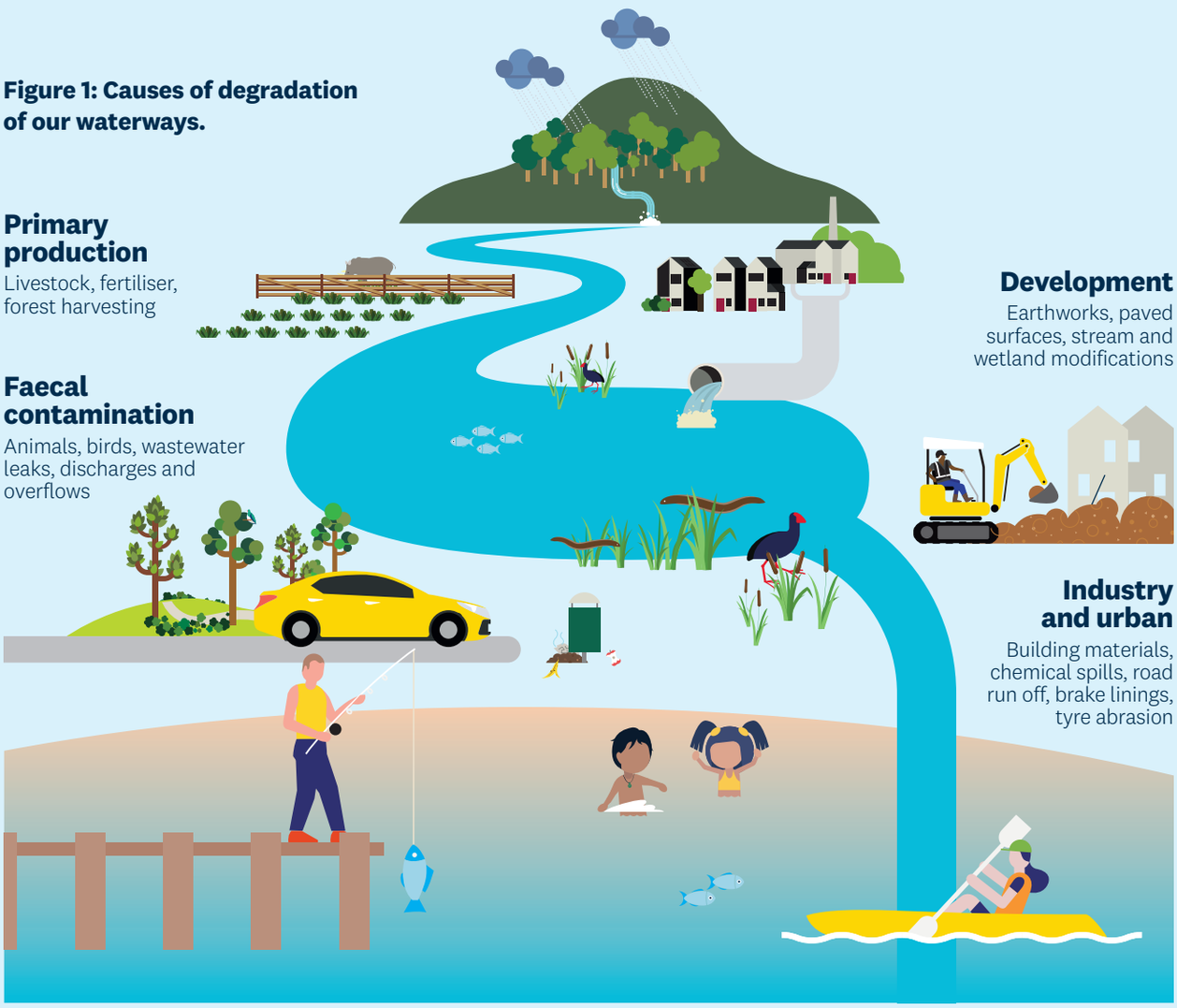
2. Auckland's freshwater is under threat

Our rivers, streams, lakes, wetlands and aquifers are not as healthy as they once were. Population growth, urban and rural development, and the way we use our land and water have had a negative impact on the mauri (life force) of freshwater across Tāmaki Makaurau. Water quality may degrade further if we don't manage land use activities better.

Water quality and ecosystem health is generally good at the top of river catchments, where the land cover is mainly native forest. As rivers and streams flow down from the hills, the surrounding land use changes, with less vegetation and more rural and urban activity. Water quality and ecosystem health is much poorer in these areas.

All these pressures have impacts on what we individually and collectively value about freshwater, such as being able to use waterways for swimming and recreation, harvesting mahinga kai, and protecting threatened species.

Figure 1: Causes of degradation of our waterways.



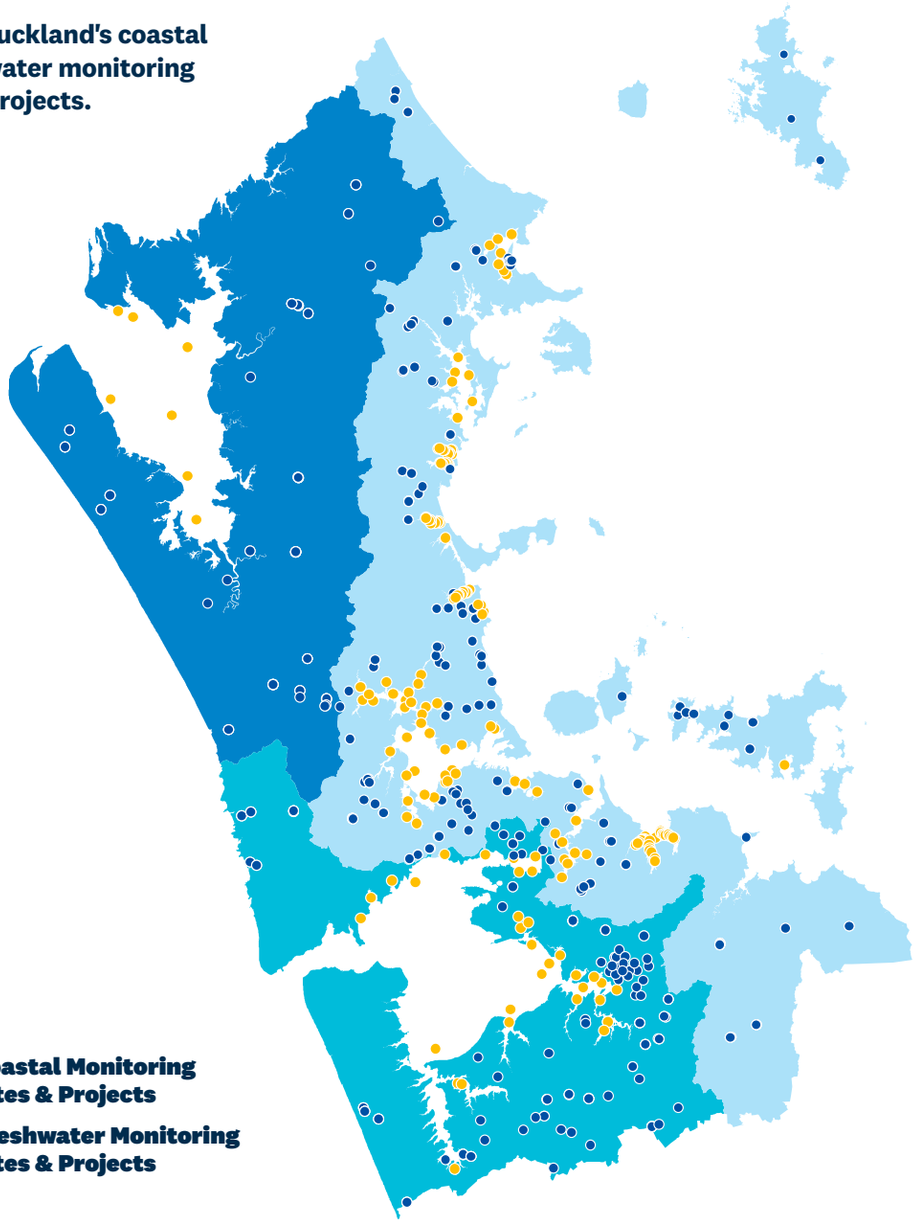
How we monitor and model freshwater health

Auckland Council carries out regular freshwater monitoring across Auckland as part of our State of the Environment monitoring programme. For example, we monitor rainfall, river flows, groundwater levels, water quality in rivers and streams, lakes and groundwater, and aquatic life and habitats in rivers, lakes and wetlands. We are working to improve our coverage of waterbodies over time and have recently increased our regional lakes monitoring programme from five to 15 lakes. Our river and stream monitoring network has also been expanded.

The monitoring provides information to understand the current state (at any point in time) and long-term trends – both positive and negative – in our freshwater bodies and in the ecosystems they support. The NPS-FM utilises this monitoring for grading state via bands, with A being very good and D (or E) being poor.

We use the best monitoring information available and can also utilise several modelling tools to extrapolate results for our region. These tools help the council and communities to better understand the extent of issues facing our region's freshwater bodies.

Figure 2: Auckland's coastal and freshwater monitoring sites and projects.



3. Auckland's diverse freshwater bodies

The NPS-FM talks about rivers and streams, lakes, wetlands, aquifers (groundwater), and springs. This section gives an overview of these waterbodies in Tāmaki Makaurau / Auckland.

19,000 km of permanently flowing awa / rivers

Most rivers and streams in Tāmaki Makaurau are short and narrow, with little distance in the journey from their headwaters to the coast. They are mostly slow-flowing (except during heavy rainfall), gently-sloping and with soft stream beds. Less than 20 per cent of the stream system is within native forested catchments. Everywhere else, the surrounding land has been cleared for rural and other productive uses, and urban development. The largest rivers are the Hoteo and Wairoa rivers.

30+ natural roto / lakes

There are dune lakes on the Āwhitu and Kaipara Peninsulas, and at Te Arai. Lake Pupuke is a deep lake occupying a volcanic crater. Most lakes in Tāmaki Makaurau are fed by rainfall or groundwater systems rather than being part of river networks.

Many, mostly small, repo / wetlands

Wetlands are a vital link between land and water. They often sit at the edges of streams, rivers, lakes and estuaries. Wetlands provide many important ecosystem services, including habitat, water quality treatment, carbon sequestration, and natural hazard management such as the accumulation of flood water.

Much of Tāmaki Makaurau's historic freshwater wetlands have been drained to enable rural production and settlement and urban development. Approximately 4% remains. Freshwater wetlands are now one of the most threatened ecosystem types both in the Auckland region and nationally.

Wai whenua / aquifers

Aquifers are natural underground stores of water, replenished by rainfall that has soaked into the ground. Some shallow aquifers and streams feed freshwater to each other. At drier times of the year, groundwater may provide significant stream or wetland flows and sustain these freshwater ecosystems. Groundwater is also used for irrigation, stock drinking, industrial use, municipal supply, and domestic uses.

Puna / springs

Groundwater may exit to the surface as springs, such as at Onehunga, Franklin, and Western Springs – which became a lake when an artificial reservoir was constructed in 1875. The region's puna are sacred to mana whenua.



▶ Karekare Falls, Karekare



4. The National Policy Statement for Freshwater Management

National Policy Statements are issued under the Resource Management Act 1991 (the RMA). They allow central government to state objectives and policies for matters of national significance that support the sustainable management purposes of the Act.

The National Policy Statement for Freshwater Management 2020 (NPS-FM) directs every regional council, alongside mana whenua and the community, to develop a plan to maintain or improve the state of freshwater in every region of Aotearoa[1]. It applies to all freshwater including rivers, streams, lakes, wetlands, aquifers (groundwater) and springs. It also requires us to consider how freshwater affects coastal environments and the foreseeable impacts of climate change.

4.1. The Essential Freshwater Package

The Essential Freshwater package is central government's response to the nationwide challenges with improving freshwater management. Launched in 2020, the package aims to:

- stop further degradation of freshwater
- start making immediate improvements to water quality within five years
- reverse past damage to bring waterways and ecosystems to a healthy state within a generation.

The NPS-FM is a part of the Essential Freshwater package, along with other pieces of law, including:

- new National Environmental Standards for Freshwater (NES-F)
- new Stock Exclusion Regulations
- amendments to the Measurement and Reporting of Water Takes Regulations
- amendments to the RMA to provide for a faster freshwater plan-making process
- new Freshwater Farm Plans Regulations.

▼ Hoteo River



4.2. Te Mana o te Wai

The purpose of the NPS-FM is to ensure that our natural and physical resources are managed in a way that prioritises Te Mana o te Wai. This is the 'fundamental concept' of the NPS-FM. It describes the vital importance of water, and establishes a priority order to support decision making, known as the hierarchy of obligations:

- First, the health and wellbeing of waterbodies and freshwater ecosystems
- Second, the health needs of people (such as drinking water)
- Third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

The hierarchy of obligations requires a fundamental change to the way we manage freshwater. It recognises that the health and wellbeing of freshwater must be secured before the health and other needs of people can be met.

In degraded waterbodies, this will require changes to current resource use, to restore Te Mana o te Wai. New development may proceed but in a way that gives effect to Te Mana o te Wai. This means economic gain, urban development or lifestyle activities cannot come at the expense of the health of a water body.

To give effect to Te Mana o te Wai, we need to include an objective in the Auckland Unitary Plan (Regional Policy Statement chapter). We have developed the proposed wording below with mana whenua.

The draft objective relates to all 'freshwater management'. This includes managing land use activities that may affect water, as well as water takes, discharges and activities within waterbodies. It applies to a wide range of council activities and functions such as policy development (plan changes and action plans), regulatory actions (consenting and compliance monitoring) and non-regulatory actions (council strategies, asset management, monitoring, support for community work, incentives and training).

4.3. Our proposed objective for Te Mana o te Wai

Freshwater management in Tāmaki Makaurau will give effect to Te Mana o te Wai by:

(a) Restoring, enhancing and protecting Te Mauri o te Wai; recognising that water is taonga and a living entity, and that when Te Mauri o te Wai is degraded, there can be no Te Mana o te Wai.

(b) Taking a transformative, aspirational, and innovative approach, consistent with te ao Māori, that prioritises halting further degradation, achieves remediation and recognises that freshwater management to date has led to widespread degradation.

(c) Ensuring natural and physical resources are managed in a way that prioritises:
  (i) first, the health and well-being of water bodies and freshwater ecosystems
  (ii) second, the health needs of people (such as drinking water)
  (iii) third, the ability of people and communities to provide for their social, economic and cultural well-being, now and in the future.

(d) Involving Mana Whenua consistent with the Auckland Unitary Plan Regional Policy Statement objectives in B6.2 (recognising Te Tiriti o Waitangi partnerships and participation) and B6.3 (Mana Whenua values) and by recognising and providing for Mana Whenua:
  (i) rangatiratanga and mana whakahaere,
  (ii) values, mātauranga, kaitiakitanga and tikanga,
  (iii) determination of the local expression of Te Mana o te Wai,
  (iv) partnerships at governance and operational levels.

(e) Adopting an integrated approach, ki uta ki tai – mountains to the sea, consistent with a holistic te ao Māori world view.

(f) Improving resilience to the effects of climate change.

(g) Ensuring that freshwater sustains present and future generations.

(h) Using mātauranga Māori and scientific knowledge and monitoring approaches.

[1]Auckland Council is a unitary authority. This means that it has both regional and district council functions. The Auckland Unitary Plan includes the Regional Policy Statement and Regional Plan, as well as the District Plan (other than the Auckland Council District Plan Hauraki Gulf Islands which is a separate plan).

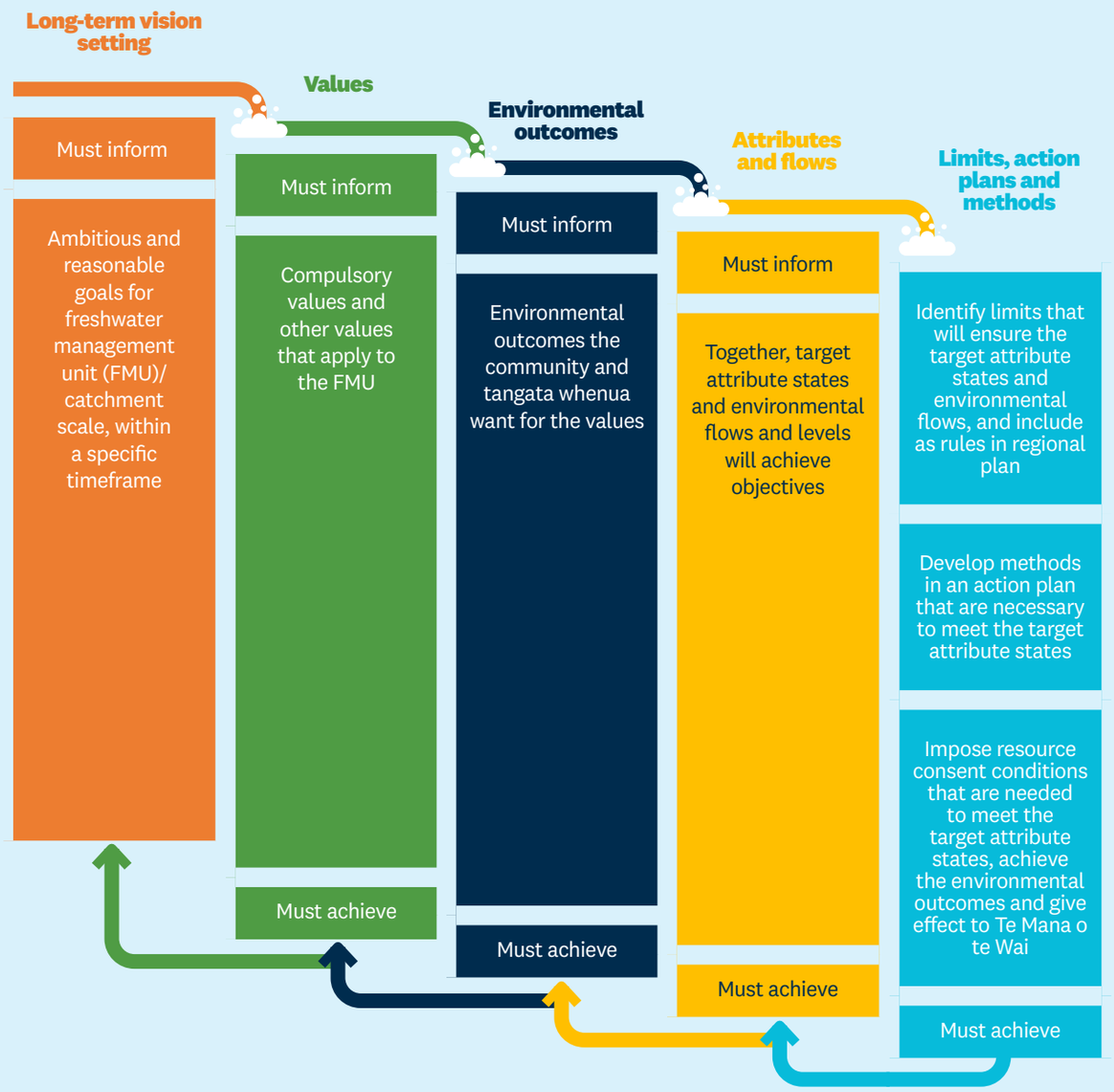
5. NPS-FM requirements for Auckland Council

This section describes the NPS-FM's requirements for how Auckland Council manages freshwater, through the National Objectives Framework and other specific requirements.

5.1. *The National Objectives Framework*

To achieve a nationally consistent approach to some freshwater issues, the NPS-FM sets out a National Objectives Framework (NOF) for councils to implement. The NOF consists of a series of related requirements (long-term vision, values etc). Each stage in the NOF sets the foundation for the next (see Fig 3).

Figure 3: Freshwater NPS-FM cascade from vision setting to methods



Auckland Council is in the process of implementing the NPS-FM (see table 1). A plan change to the Auckland Unitary Plan is expected to be notified before the end of 2024.

Table 1: Auckland Council's progress in implementing the NPS-FM

NPS-FM requirements	*Where we're at*
Embed the concept of Te Mana o te Wai to drive outcomes for freshwater	Included in this consultation, see section 4.2
Develop long-term visions for freshwater across the region	Included in this consultation, see section 6
Identify Freshwater Management Units in the region	Consulted on in 2022
Identify values for each Freshwater Management Unit	Consulted on in 2022
Identify special sites and features in Freshwater Management Units	Options discussed in this consultation, see section 7
Set environmental outcomes for each value and include them as objectives in regional plans	Consulted on in 2022 and resulting approach included in this consultation, see section 12
Identify attributes for each value and baseline states for those attributes	Options discussed in this consultation for several compulsory values with a current understanding of baseline states described, see Part Three. Detailed proposals will be finalised in 2024
Set target attribute states, environmental flows and levels, and other criteria to support the achievement of environmental outcomes	Options discussed in this consultation, see Part Four, detailed proposals will be finalised in 2024
Set limits as rules and prepare action plans (as appropriate) to achieve environmental outcomes	Options discussed in this consultation, see Part Five, detailed proposals will be finalised in 2024

5.2. Other specific requirements

The NPS-FM includes a variety of different requirements outside of the NOF process. These are focused on areas of freshwater management with special characteristics that require us to take specific courses of action, including to:

- Map and monitor **natural inland wetlands** and ensure that these are protected from further loss and degradation, and their restoration is promoted (see section 13.3)
- Avoid the loss of **river extent and values**, to the extent practicable (see section 18.1)
- Identify **outstanding waterbodies** and protect their significant values (see section 13.1)
- Identify and protect the habitats of freshwater-dependent **threatened species** (see section 13.2)
- Prepare a **fish passage** action plan to improve the extent to which existing instream structures provide for or enable fish passage (see section 18.1)
- Promote the **efficient allocation and use** of freshwater (see Part Five)
- Support the achievement of national targets for **primary contact** in specified rivers and lakes (see section 13.4)
- Develop a **freshwater accounting system** to capture and track information on water quality and quantity
- Publish **reporting** data on an annual basis and assess, review and report every five years on progress towards meeting the long-term visions for FMUs across the region.

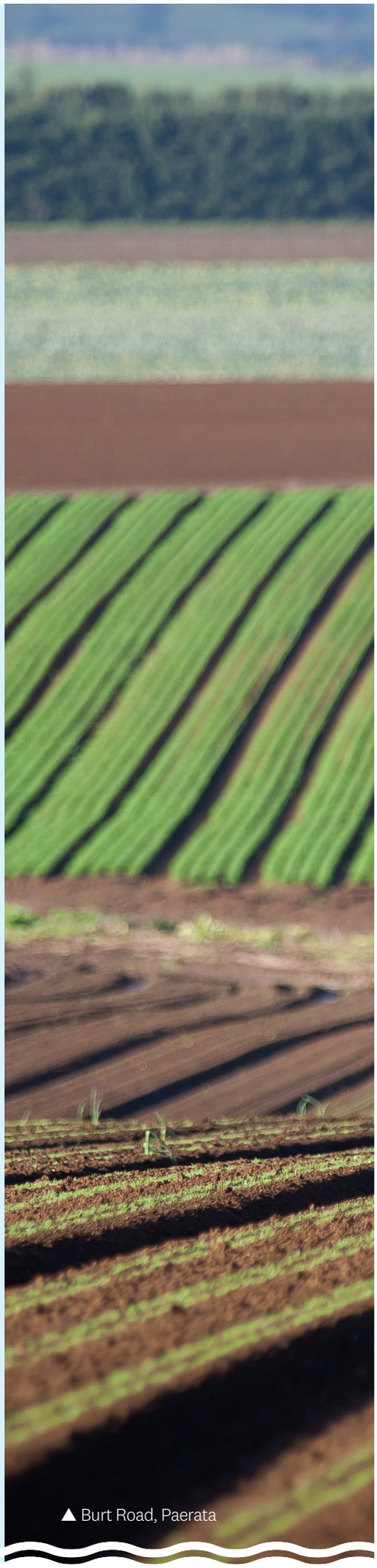
The Government's Essential Freshwater package has also developed some new rules that we must implement, which complement the broader direction sought at a regional level – these are described in section 18.

5.3. Mana whenua, communities and stakeholders

The NPS-FM requires that we engage with mana whenua and communities at each step of the process. Auckland Council is committed to undertaking robust and fulsome engagement with mana whenua, the community, stakeholders and mataawaka. Through this ongoing engagement, we are providing opportunities for different perspectives to be included.

Mana whenua engagement to date has identified many important considerations for implementing the NPS-FM across the Auckland region, including:

- giving effect to Te Tiriti o Waitangi as the starting point
- Te Mauri o te Wai is central to Auckland's mana whenua world view of how to halt degradation and enhance freshwater values - without mauri, there is no mana
- maintaining the current state of freshwater where it can be further improved is insufficient for mana whenua; degradation needs to be halted, and mauri enhanced
- the targets for improvement need to be aspirational
- mana whenua expect involvement in freshwater management processes, including decision-making and monitoring
- locally specific approaches are needed, allowing for Māori freshwater values to be applied in site-specific responses
- an integrated, holistic, whole of environment approach is needed.



▲ Burt Road, Paerata







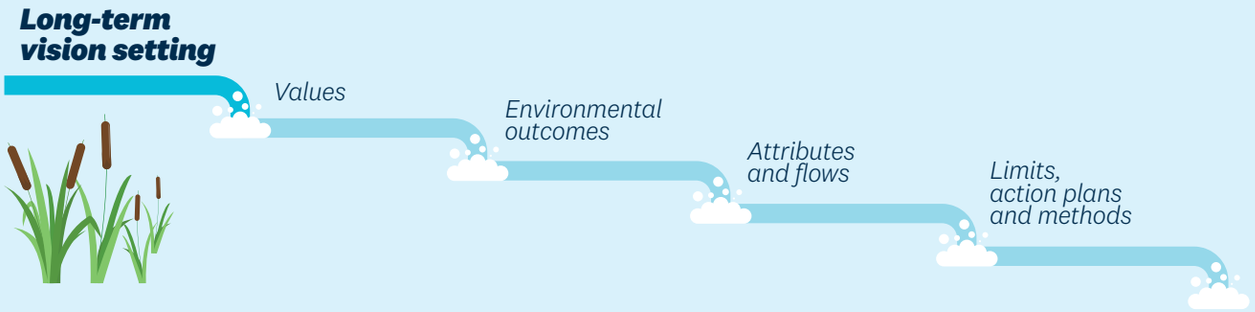
◀ Inanga

Part two: What we want to achieve

The following sections introduce the outcomes we want to achieve under the NPS-FM. This includes a proposed regional vision, Freshwater Management Units and their locally-specific visions, and the values and environmental outcomes that we are proposing in response to the National Objectives Framework. It then discusses the areas where special management is required.

6. Regional vision for freshwater

The NPS-FM challenges us to develop long-term visions for freshwater, with goals and timeframes that are ambitious but reasonable. That is, difficult to achieve but not impossible. These visions should describe how we want our freshwater and waterbodies to be in the future.



The visions must be included as objectives in the Auckland Unitary Plan (Regional Policy Statement chapter). Along with giving effect to Te Mana o te Wai, the long-term visions direct all other steps to implement the NPS-FM.

In 2022, we asked our community what they valued about waterbodies in the region. We've used the answers to shape the proposed visions. This section presents the proposed region-wide vision. We add three sub-regional visions (for Freshwater Management Units) in sections 8.1, 9.1, and 10.1.

We have started with the vision from the Auckland Water Strategy 2022 – 2050: *Te Mauri o Te Wai, the life-sustaining capacity of Auckland's water, is protected and enhanced*. This vision focuses on Te Mauri o te Wai. Mana Whenua have advised that there can be no mana without mauri, so it is a step towards giving effect to the more ambitious Te Mana o Te Wai.



▲ Awakeri Wetlands and Grove Road Box Culvert

6.1. Proposed vision for inclusion in the Regional Policy Statement

Draft long term vision – Auckland-wide

Freshwater is managed to protect and enhance te mauri o te wai (the life-sustaining capacity of water) in Auckland's freshwater bodies and ecosystems, to contribute to the revitalisation of the mauri of coastal receiving environments, and provide for the wellbeing of mana whenua and communities, such that:

a. by 2030:

1. Mana whenua have increasing connection to the waterbodies in their rohe and are enabled to embed Mātauranga Māori in freshwater monitoring and reporting to the extent they consider appropriate.
2. Waterbodies that are degrading are identified and priorities are set for action to address the causes of the degradation.
3. Net loss of streams and wetlands is no longer occurring.
4. Communities increasingly recognise and actively participate in protecting and enhancing the values of freshwater bodies, including rural and urban streams, lakes, wetlands and aquifers.
5. Land use planning and water management is integrated and contributes to an increase in resilience of freshwater resources to the effects of climate change and enhancement of the health and wellbeing of freshwater bodies.
6. Future urban growth and redevelopment applies water sensitive design so that waterways are maintained and enhanced as part of blue-green networks that enhance public access, provide amenity, and help to provide resilience to storm events.

b. by 2040:

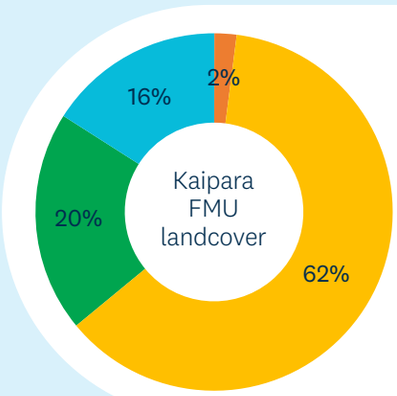
1. Flows and levels in freshwater bodies are sufficient to protect the values of ecosystem health, human contact, threatened species and mahinga kai.
2. Water quality is maintained where already good, and improved where degraded for all freshwater attributes from the baseline state.
3. Degraded freshwater systems and habitats are rehabilitated and restored so they support mahinga kai, and threatened species begin to recover
4. Measurable reductions in human-induced sediment discharge have been achieved.
5. New water infrastructure and replacement of existing water infrastructure is resilient, mauri-enhancing and where practicable nature-based.

c. by 2050 to 2080:

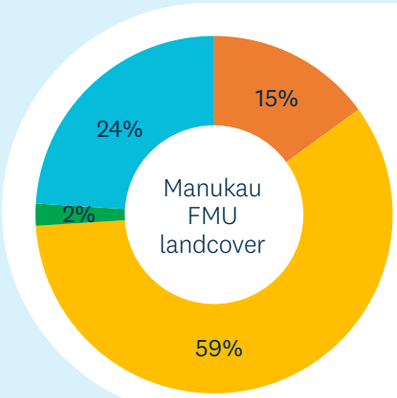
1. Water quality is improved from the baseline state for all attributes and wherever practicable is above any national bottom line.
2. Freshwater bodies are accessible and safe for swimming, recreation and mahinga kai gathering to the fullest extent practicable.
3. Freshwater habitats support a healthy and diverse aquatic ecosystem.
4. The operation of water infrastructure is resilient, mauri enhancing and where practicable nature-based.

See the next sections on Freshwater Management Units to read the proposed sub-regional visions

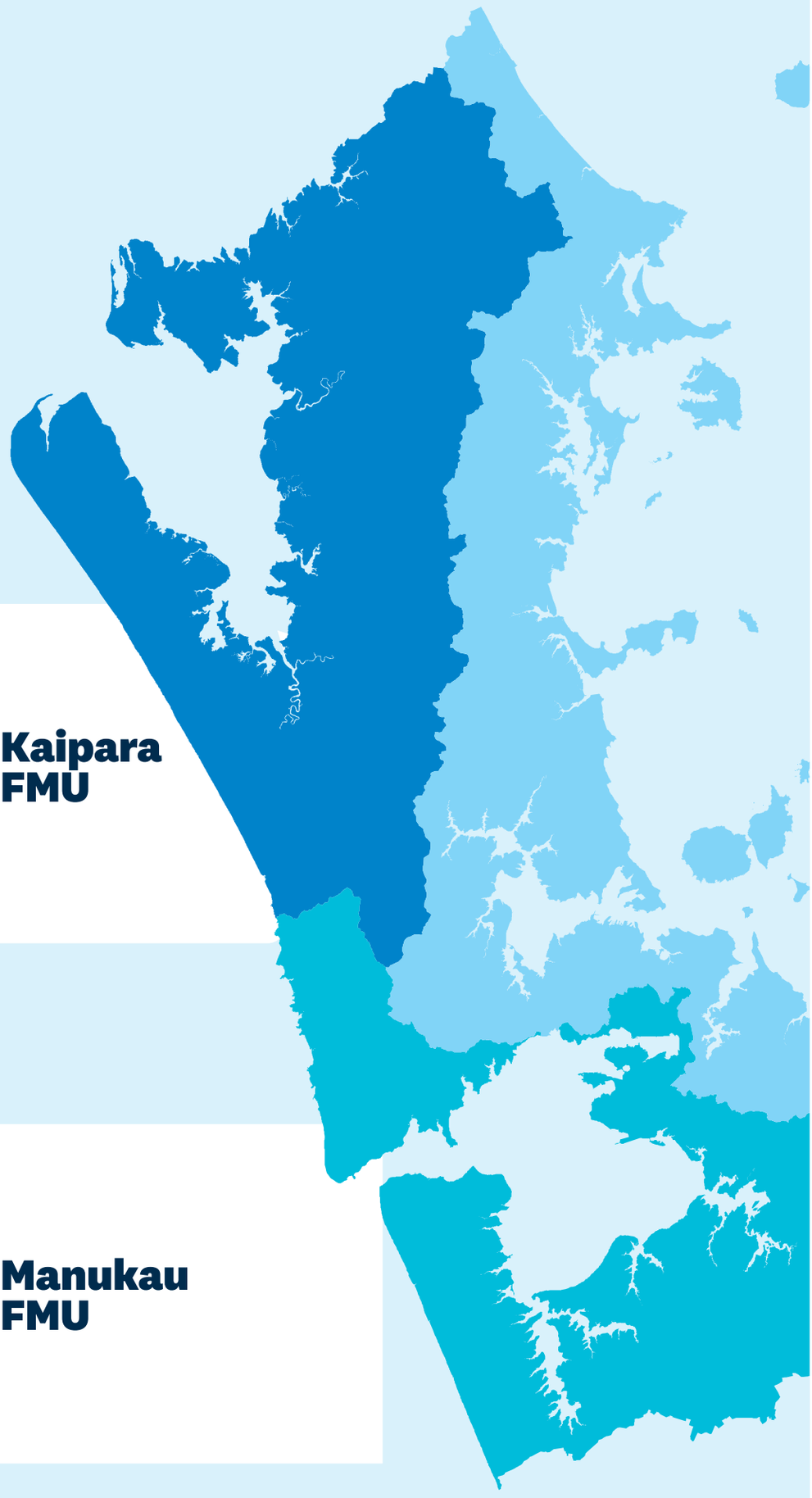
7. Freshwater Management Units



Kaipara FMU



Manukau FMU





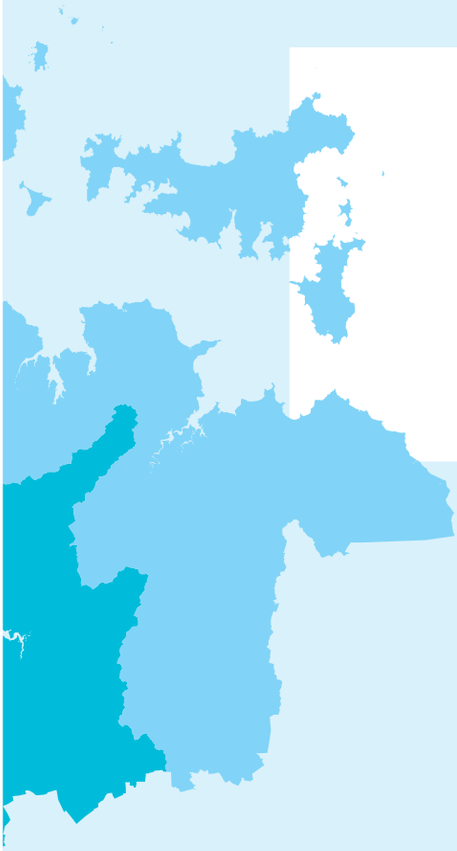
After community consultation in 2022, we have identified three Freshwater Management Units (FMU) for Tāmaki Makaurau / Auckland. These are the spatial units we think are appropriate for freshwater management and accounting purposes. They are:

- Kaipara FMU
- Hauraki FMU
- Manukau FMU

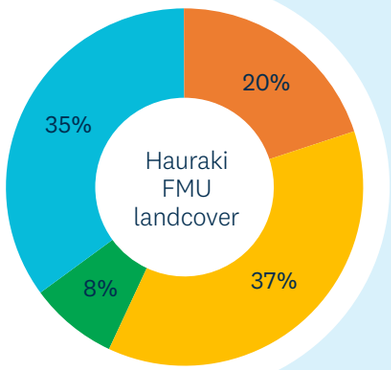
Each FMU contains the surface and groundwater systems that drain into one of our three main coastal waterbodies. This approach was chosen to reflect that improvement in freshwater would also lead to improvements in our coastal waters.

The FMUs are different from each other, and have quite varied environments within their boundaries. Some parts of each FMU have more complex environmental issues than others and will need more significant changes than others. We have the option to develop and use 'part-FMUs' when and if it is determined to be useful.

Each FMU shares at least one boundary with other regions. Cross boundary issues will need to be managed.



Hauraki FMU



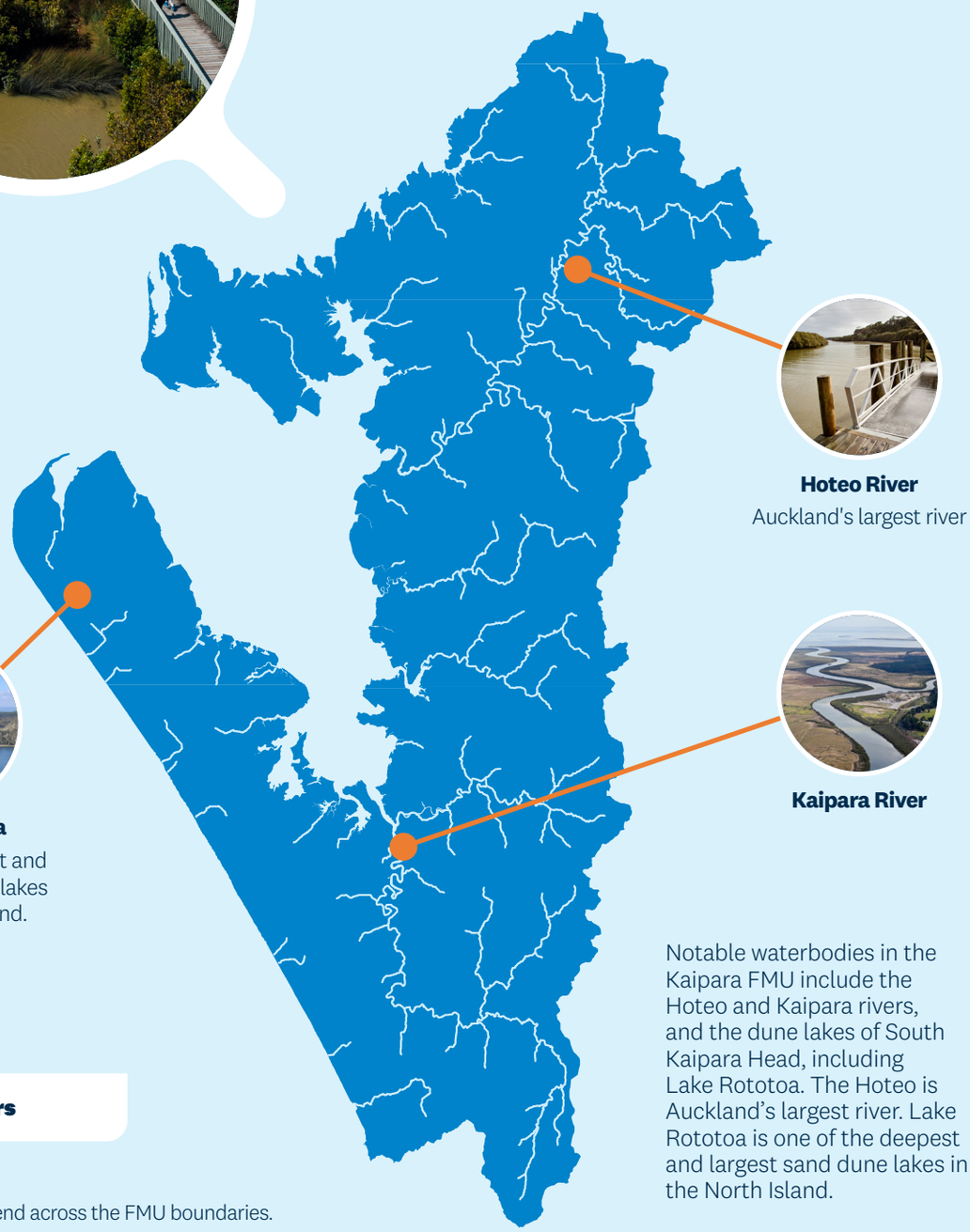
Key

- Urban
- Rural
- Exotic forest
- Native forest/scrub

8. Kaipara FMU

The Kaipara is our most rural FMU, with 62 per cent rural land cover, 20 per cent exotic forestry, and only 2 per cent urban. Most of the rivers and streams in the 1,161 km^2 Kaipara FMU flow to the Kaipara Harbour, the largest harbour in the Southern Hemisphere and New Zealand's largest estuarine ecosystem. A small proportion of streams drain directly to the Tasman Sea from the coast between Kaipara Harbour's South Head and Muriwai.





Hoteo River
Auckland's largest river



Lake Rototoa
One of the deepest and largest sand dune lakes in the North Island.

Kaipara River

Key

Large rivers

Notable waterbodies in the Kaipara FMU include the Hoteo and Kaipara rivers, and the dune lakes of South Kaipara Head, including Lake Rototoa. The Hoteo is Auckland's largest river. Lake Rototoa is one of the deepest and largest sand dune lakes in the North Island.

[2]Some aquifers extend across the FMU boundaries.

The freshwater issues most affecting the Kaipara FMU are:

- Sediment in rivers, streams and lakes, and discharges into the Kaipara Harbour (both from the Auckland and Northland portions of the harbour's catchment)
- *E. coli* in rivers and streams, from multiple sources including but not limited to pastoral farming, forestry (feral animals) and on-site wastewater systems
- Some indications of eutrophication in dune lakes
- Increased demand for groundwater in localised areas, due to variable land uses. Water demand is particularly an issue for small streams during low-flow periods and may become more of an issue as droughts become more frequent and as stream flows change.

The Kaipara Moana Remediation Programme is an important programme for this FMU (and for the Northland part of the Kaipara catchment), with iwi, community, regional and district councils and the Crown working together to restore the health and mauri of the harbour and its contributing streams.

8.1. Proposed vision for the Kaipara FMU

The following text is proposed to supplement the region-wide vision with a particular focus on the Kaipara FMU. It should be read in conjunction with the region-wide vision in section 6.1.

For all timeframes, as well as achieving the Auckland-wide vision, in the Kaipara FMU:

1. The Kaipara catchment is managed holistically acknowledging the whakapapa / connections of freshwater, mountains, whenua and moana, mana whenua and communities (ki uta ki tai) that cut across council jurisdictional boundaries.
2. The water bodies in the Kaipara catchment are managed as living and connected entities where local communities actively engage in their restoration and protection to restore the health and mauri of Kaipara Moana.
3. The dune lakes are healthy and thriving.



▲ Kaipara River

9. Hauraki FMU

The Hauraki FMU is our most urbanised FMU, at around 20 per cent of land cover. Around the Waitemata Harbour and the coastal fringe is especially concentrated around the Waitematā Harbour. This FMU is home to regionally significant water infrastructure, including the Rosedale Wastewater Treatment Plant. Encompassing 2,182km^2, the FMU also contains large areas of rural land, and native forest including the Auckland portion of the Hunua Ranges. It includes the diverse landscapes and environmental values of the Hauraki Gulf Islands.





Lake Pupuke

Largest and deepest lake in Auckland and is a popular spot for rowing and other water sports



Lake Tomorātā[3]

Shallow dune lake popular for water skiing, swimming and paddleboarding. Home to several threatened species.



Wairoa River

Auckland's second largest river (catchment area of 260km^2). Flows from the Hunua Ranges to Clevedon before becoming an estuary that reaches the Hauraki Gulf at Pouto Point

Key

— Large rivers

[3]The spelling of Lake Tomorātā used in this report is based on guidance from Ngāti Manuhiri and is different to the official spelling (Lake Tomarata) recorded by LINZ.

The freshwater issues most affecting the Hauraki FMU are:

- Poor ecosystem and macroinvertebrate community health in urban and rural rivers and streams
- *E. coli* in urban and rural rivers and streams, from a range of sources including wastewater discharges, stormwater runoff and animal excrement
- The effects of urbanisation on natural freshwater systems, including:
  - impervious surfaces reducing groundwater soakage and increasing stormwater peak flows
  - the discharge of contaminants from failing stormwater and wastewater infrastructure
  - ammonia, zinc and copper contamination in urban streams
  - continued modification of streams and wetlands in new developments
- Eutrophication in some rural lakes.

All rivers and streams drain to the Hauraki Gulf, either directly to the coast or from contributing waterbodies such as the Waitematā, Whangateau and Mahurangi harbours, and the Tāmaki Estuary. The Hauraki Gulf Marine Park is a highly valued place, with particular cultural and spiritual significance for mana whenua and its own specific legislation.

9.1. Proposed vision for the Hauraki FMU

The following text is proposed to supplement the region-wide vision with a particular focus on the Hauraki FMU. It should be read in conjunction with the region-wide vision in section 6.1.

For all timeframes, as well as achieving the Auckland-wide vision, in the Hauraki FMU:

1. The Hauraki Gulf catchment and all its freshwater bodies are understood to be a living and connected entity, indivisible from Te Moananui-ā-Toi / Hauraki Gulf.
2. There is restoration and creation of wetland systems to trap sediment before it reaches coastal waters.
3. The freshwater systems of the islands of the Hauraki Gulf are protected and if necessary, restored for present and future generations to sustain cultural, spiritual, social, economic and kaitiaki needs.
4. The freshwater systems of the Hunua Ranges are protected and treasured for their many values including their ecosystems, recreation, and drinking water supply.



▲ Lake Tomorātā

10. Manukau FMU



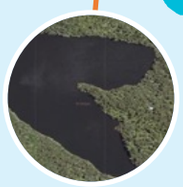
Predominantly rural, the 1,106km^2 area drains to the Manukau Harbour and the Tasman Sea. The Manukau is the second largest harbour in New Zealand and a globally significant migratory bird roosting area. This FMU is home to regionally significant built water infrastructure, including the Māngere Wastewater Treatment Plant (MWTP), and several municipal water supply dams.

Notable water features include the Waitākere River, the Puhinui, Papakura, Hingaia, Ngakaroa, Whangapouri, Whangamaire and Mauku streams, and the many smaller waterways of the Waitākere Ranges Regional Park, which includes the catchments of the municipal water supply dams.



Cascade Stream

Popular stream-side walk. Currently closed due to kauri dieback



Lake Kawaupaku

Known as the Horse Shoe Lake

One of few dune lakes in region surrounded by native forest



Papakura Stream

Mid-order, low gradient stream that flows from Whitford to Pahurehure Inlet



Ngakoroa Stream

Mid-order, medium gradient stream that flows from the Bombay Hills to Pahurehure Inlet

Key

Large rivers

The Manukau FMU is home to a diverse range of land uses in five distinct areas:

- The native-forested Waitākere Ranges
- The urbanised central isthmus
- The currently rural but rapidly developing southern areas of Papakura and Drury
- The Specified Vegetable Growing Area at Pukekohe
- The less populated Awhitu Peninsula including several dune lakes.

The waterbodies of the forested areas of the Waitākere Ranges are in good health. Much of the rest of the Manukau Harbour catchment has been heavily modified and degraded through land use change.

The freshwater issues most affecting the Manukau FMU are:

- High nitrate concentrations in surface water and shallow groundwater in some parts of the Pukekohe Specified Vegetable Growing Area
- Poor ecosystem and macroinvertebrate community health in urban and rural rivers and streams
- *E. coli* in urban and rural rivers and streams, from multiple sources, including but not limited to pastoral farming, wastewater discharges and on-site wastewater systems
- The effects of urbanisation on natural freshwater systems, including:
  - impervious surfaces reducing groundwater soakage and increasing stormwater peak flows
  - the discharge of contaminants from failing stormwater and wastewater infrastructure
  - ammonia, zinc and copper contamination in urban streams
  - continued modification of streams and wetlands in new developments
- Water demand may be exceeding sustainable limits in some aquifers
- Water is also taken from streams and rivers for agriculture and horticulture. In summer, when stream flows are low, there may be a need for some or all water users to cut back to ensure there is still water for the health of the river ecosystems.

10.1. Proposed vision for the Manukau FMU

The following text is proposed to supplement the region-wide vision with a particular focus on the Manukau FMU. It should be read in conjunction with the region-wide vision in section 6.1.

For all timeframes, as well as achieving the Auckland-wide vision, in the Manukau FMU:

1. The Manukau catchment and all its water bodies are respected by its communities by being well known and visible, with access restored.
2. The rich cultural history of waterways of the Manukau catchment is known and celebrated with mana whenua exercising mana whakahaere and kaitiakitanga so that it is safe to source and eat kai, to swim and safely pursue traditional and contemporary activities and tikanga (including tauranga waka, portage routes, and connections with cultural heritage).
3. The legacy of degradation of waterways has halted and reversed.
4. The Manukau catchment management actively supports that Te Manukanuka o Hoturoa, the receiving environment of the Manukau Harbour, has mana and prestige and its mauri is enhanced, revitalised and protected.
5. The freshwater systems of the Waitākere Ranges are protected and treasured for their many values including their ecosystems, recreation, and drinking water supply.
6. The Pukekohe Specified Vegetable Growing Area has a healthy freshwater environment where its wellbeing is protected and enhanced while supplying fresh vegetables for the health and wellbeing of the peoples of Aotearoa New Zealand
7. The Awhitu lakes are recognised as part of an important ecological network of springs, streams and wetlands.
8. The Waikato River tributaries are recognised and understood as being indivisible from the Waikato River, te mana o te Awa, and the whakapapa of mana whenua.

11. Freshwater values

Values are the things that people think are important about water. They will guide what we prioritise in freshwater management. The NPS-FM sets out four values that are compulsory, and another nine values that must be considered.



After evaluation, we have concluded that all except one of the 13 values described in the NPS-FM are relevant to the whole of the Auckland region. The exception is hydroelectric power because there is no commercial generation in the region.

We are also proposing to add two values:

- **resilience** to recognise the community desire to increase resilience to hazards and climate change, and
- **amenity** to recognise the value Aucklanders place on being able to access rivers, lakes, wetlands and waterfalls as part of recreation activities that do not involve contact with the water. Amenity values have a strong linkage with the 'natural form and character' value. They also include physical characteristics that contribute to people's appreciation of waterways' pleasantness, aesthetic coherence, and cultural and recreational attributes.

In 2022, we asked the public about the freshwater bodies they use or value. We received over 600 pieces of feedback, identifying over 200 individual sites of value. The values most raised by submitters were:

- ecosystem health, including water quality and habitat
- natural form and character
- drinking water supply
- human contact for recreational purposes such as swimming, boating or fishing.



Table 2: Auckland's freshwater values.

	NPS-FM Values	*Relevant to Tāmaki Makaurau*
Compulsory	1. Ecosystem health a. water quality b. water quantity c. habitat d. aquatic life e. ecological processes	✓
	2. Human contact	✓
	3. Threatened species	✓
	4. Mahinga kai	✓
Must be considered	5. Natural form and character	✓
	6. Drinking water supply	✓
	7. Wai tapu	✓
	8. Transport and tauranga waka	✓
	9. Fishing	✓
	10. Hydro-electric power generation	✗
	11. Animal drinking water	✓
	12. Irrigation, cultivation and production of food and beverages	✓
	13. Commercial and industrial use	✓
Added	14. Resilience	✓
	15. Amenity	✓



▲ Bycroft Reserve

12. Environmental outcomes

For each of the values we have identified, we need to describe the environmental outcomes we want to achieve in Tāmaki Makaurau / Auckland. For example, because threatened species are an important value, we want to protect the critical habitats where these species live - the environmental outcome to achieve the value.



Once we agree the environmental outcomes, we need to include them as objectives in the Auckland Unitary Plan. They need to be written in a way that enables us to assess how effectively our efforts contribute to the outcomes.

At this stage, we are proposing that all the identified values and environmental outcomes are relevant to all three FMUs. Rather than set outcomes for each FMU, it is more efficient to develop one set of region-wide objectives.

We have identified three area-specific objectives, for the Pukekohe Specified Vegetable Growing Area (Manukau FMU), the Waitākere Ranges (largely in the Manukau FMU but extending into the Hauraki and Kaipara FMUs) and the Hunua Ranges (Hauraki FMU). This is because the freshwater management needs in these areas are different to the rest of the region. **We want to hear if you think there are other FMU or part-FMU specific objectives that we should include.**

Table 3: Proposed environmental outcomes for Auckland's freshwater values.

Value	***Proposed outcome/ Auckland Unitary Plan objective***
Ecosystem health • **Water quality**	Freshwater *(rivers, lakes, wetlands and groundwater)*: Water quality is protected where it is excellent or good, and improved where it is degraded, to support Te Mauri o te Wai (the life-sustaining capacity of water) and provide for Te Mana o te Wai. Coastal receiving environment: The quality of freshwater supports the health and well-being of ecosystems in harbours and estuaries and the use the coast.
• **Surface water quantity**	The flows and levels of water in surface waterbodies will: (a) sustain mauri, life-supporting ecological processes and habitats and protect ecosystem health (b) maintain and where degraded, improve the natural form, extent and variability in the level or flow of water and safeguard natural character.
• **Groundwater quantity**	The flow and levels of groundwater will be managed to: (a) sustain the mauri, life supporting ecological processes and habitat and protect ecosystem health (b) safeguard the values of surface waterbodies that derive all or part of their flow from groundwater (c) prevent intrusion of saline water at the coast.
• **Habitat**	Aquatic habitats and freshwater ecosystems are protected where they have high value, and where degraded are improved, including: (a) the natural form, structure and extent of freshwater bodies including the beds, banks and margins (b) the indigenous vegetation within the freshwater system and along its margins (c) the natural flows, pools, riffles and runs of rivers (d) the migratory access of native fish (e) the natural connections to floodplains, riparian margins, wetlands and aquifers.

• **Aquatic life**	The ecological well-being and habitat of freshwater systems are safeguarded and enhanced to support the abundance and diversity of indigenous flora (plant) and fauna (animal) communities.
• **Ecological processes**	The natural functioning of ecological processes that are degraded are improved; and, where they are not degraded they are protected to provide for the life-supporting capacity of freshwater bodies.
Human contact	Water quality and water quantity in freshwater bodies provides for people to connect safely with the water through swimming and other water-based activities, except in locations where the public safety issues or risks to cultural values not being maintained mean contact recreation is inappropriate.
Threatened species	Waterbodies that support a population of threatened species have terrestrial and aquatic habitats necessary to support the presence, abundance, survival and recovery of the threatened species.
Mahinga kai	The mauri of freshwater systems is protected. Mana whenua have access to freshwater bodies and mahinga kai.
Natural form and character	The natural qualities, characteristics and features of freshwater systems that are degraded are improved, and where they are not degraded they are safeguarded.
Drinking water supply	Water quality and quantity is sufficient for people to have reliable and healthy clean water for drinking and reasonable domestic use.
Wai tapu	Wai tapu is protected and the tikanga associated with these sites and waters is upheld.
Fishing	Fish abundance and diversity supports the long-term viability of sustainable recreational and commercial fishing of species that are allowed to be caught and eaten.
Transport and tauranga waka	The navigation and safety of existing navigable rivers and lakes are maintained and there are appropriate public access points to launch waka and watercraft.
Animal drinking water	Water quality and quantity is sufficient for farmed animals to have reliable, safe and palatable drinking water.
Irrigation, cultivation, and production of food and beverages	Water quality and quantity is sufficient for reasonable and efficient irrigation and food processing, with freshwater needs provided for to an adequate level of reliability.
Commercial and industrial use	Water quality and quantity is sufficient for reasonable and efficient commercial and industrial uses, with freshwater needs provided for to an adequate level of reliability.
Resilience	Streams, wetlands, lakes, riparian margins and floodplains support an integrated natural stormwater system that: (a) makes space for water, (b) provides for the mana of the wai and (c) ensures the resilience of communities to climate change. Freshwater systems are resilient to climate change and contribute to climate mitigation.
Amenity	Freshwater systems and their margins are enhanced to provide amenity for activities that occur near water. Urban areas have blue-green networks where waterways are integrated into the urban form, along with walkways and cycleways, and contribute to community wellbeing.
Specified vegetable growing area	Pukekohe Specified Vegetable Growing Area Water quality progressively improves over time while not compromising the domestic supply of fresh vegetables and maintaining food security for New Zealanders.
Waitākere Ranges Heritage Area	The ecosystem health of the freshwater systems in the Waitākere Ranges Heritage Area is protected, and their recreation and drinking water supply values are maintained.
Hunua Ranges	The ecosystem health of the freshwater systems in the Hunua Ranges is protected, and their recreation and drinking water supply values are maintained.

13. Areas where special management is required

The NPS-FM sets out some areas where a more specific approach is required to manage special sites and features. We are proposing to introduce additional management measures for these areas and develop action plans to support the protection of their special qualities. We already apply a similar approach in the Auckland Unitary Plan, using overlay maps to identify places that require special consideration.

In future, we may identify other areas where we need to manage activities differently. The NPS-FM provides for identification of smaller 'part-FMUs' for these situations.

13.1. Outstanding waterbodies

Outstanding waterbodies are the rivers, lakes and wetlands that are 'the best of the best' or pre-eminent in the region. We have developed criteria and assessed available information to propose the list of waterbodies below. Some of the matters considered include:

- Māori cultural values – the importance, association and values of the water body to mana whenua
- Ecological – threatened species (bird, fish and plant), species diversity, ecosystem health and water quality
- Landscape / natural character – biophysical and perceived naturalness of the waterbody and its context, expressiveness and legibility, aesthetic / scenic values, associative values
- Recreation – whether there are very high-quality recreation experiences, use for competitions, attraction for people from throughout the region; evidence of a very high level of use for swimming, fishing, rowing, kayaking, windsurfing, canyoning or waterskiing; or attracts people for outdoor experiences adjacent to waterways (e.g., waterfall destinations).



▲ Lake Rototoa

A waterbody needs to be outstanding in one of these areas to be identified, not in all of them. The possible waterbodies identified so far are listed in Table 4. More work is needed which may add or remove waterbodies from this list. We also need to determine what activities should be managed within the waterbodies and in their catchments to protect the significant values (Section 13.4 provides some examples).

Refer to freshwater consultation viewer for maps of the preliminary list of outstanding waterbodies

Table 4: Preliminary list of outstanding waterbodies.

Waterbody	*Area*	*Value*
Lake Tomorātā (lake and wetland)	Te Arai	Cultural, Landscape, Ecological, Recreation
Pakiri Valley Swamp Forest	Pakiri	Cultural, Ecological
Omaha Taniko wetland	Omaha	Cultural, Ecological
Lake Te Kanae	South Head, Kaipara Peninsula	Cultural, Landscape
Lake Rototoa (lake and wetland)	South Head, Kaipara Peninsula	Cultural, Landscape Ecological
Papakanui wetland	South Head, Kaipara Peninsula	Cultural, Ecological
Lake Wainamu	Te Henga / Bethells	Cultural, Landscape
Lake Kawaupaku	Te Henga / Bethells	Cultural, Landscape
Lake Pupuke	Takapuna	Cultural, Recreation
Anawhata Stream, Marawhara stream, Piha Stream, Centennial Stream, Glen Esk Stream, Karekare Stream, Pararaha Stream, Whatipu Stream, Karamatura Stream, Kakamatua Stream	Waitākere Ranges	Cultural, Landscape (Piha Stream and Glen Esk Stream - Ecological Recreation)
Te Henga wetlands / Waitākere River (stream/lake/river)	Te Henga, Waitākere Ranges	Cultural, Ecological, Landscape
Whatipu wetland, Pararaha swamp, Ohaka head lake, Taranaki Bay swamp / Pararaha Stream, Amphlett Stream outlets (stream/lake/river)	Whatipu, Waitākere Ranges	Cultural, Ecological
Orere River	Orere Point	Cultural, Landscape
Tāpapakanga Stream, Waimango Stream	Hunua Ranges	Cultural, Landscape
Awana Stream	Awana, Great Barrier Island	Cultural, Landscape
Kaitoke wetland	Kaitoke, Great Barrier Island	Cultural, Landscape, Ecological

13.2. Threatened species habitat

We have identified the presence of 24 nationally threatened freshwater-dependent species (13 plants, 5 birds, 3 invertebrates, 2 fish and 1 reptile) in the Auckland Region. This number may change as additional data is obtained and the definition of 'freshwater dependence' is refined.

Our current data may not reflect the true regional extent of threatened freshwater-dependent species as observations have generally been biased to public spaces and conservation areas because of their ease of access. An initial assessment indicates that threatened freshwater species are widely spread throughout the region and can be found across multiple land use types including urban, rural and conservation areas. Examples of the various locations and environments where threatened freshwater species are found can be seen in Figure 4.

We are investigating additional mapping that will include a variety of potential critical habitat areas/types. We have more work to do to assess what controls are needed to ensure connectivity between relevant habitat types and areas.

13.3. Natural inland wetlands

The Auckland Unitary Plan identifies significant wetlands and includes provisions designed to protect them from land development and other activities. We intend to improve the mapping of the extent of natural inland wetlands and integrate some of the national regulation requirements into the Auckland Unitary Plan to simplify how we determine which rules apply to wetland management.

▼ **Figure 4: Examples of locations and environments where threatened freshwater species are found in Auckland.**



Ngāroto Lakes complex – Bittern use a patchwork of wetlands across large sections of Auckland including those along the northeast section of the region. These wetlands support threatened plants.



Lake Rototoa – Threatened freshwater birds can be found in most of Auckland's lakes including dabchick and bittern.



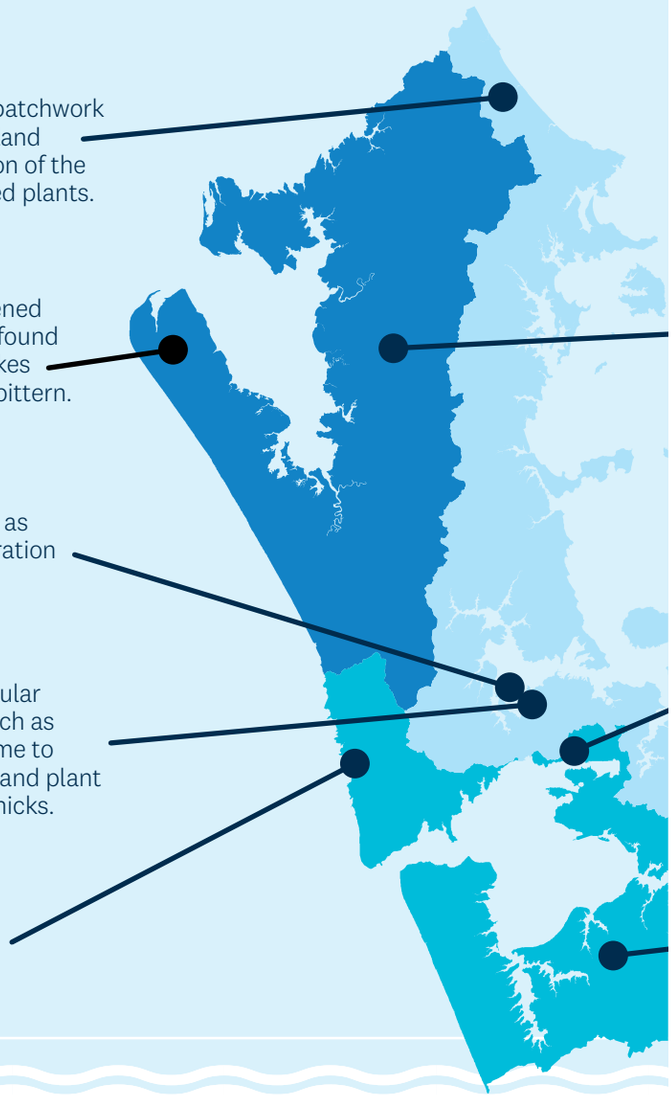
Oakley Creek – Threatened species such as freshwater mussels can be found in restoration sites like Oakley Creek.



Western Springs – Popular recreational reserves such as Western Springs are home to several threatened bird and plant species, including dabchicks.



Waitākere Ranges - Conservation areas like the Wāitakere Ranges support several threatened fish and invertebrate species, such as shortjaw kōkopu



13.4. What will management of these special areas involve?

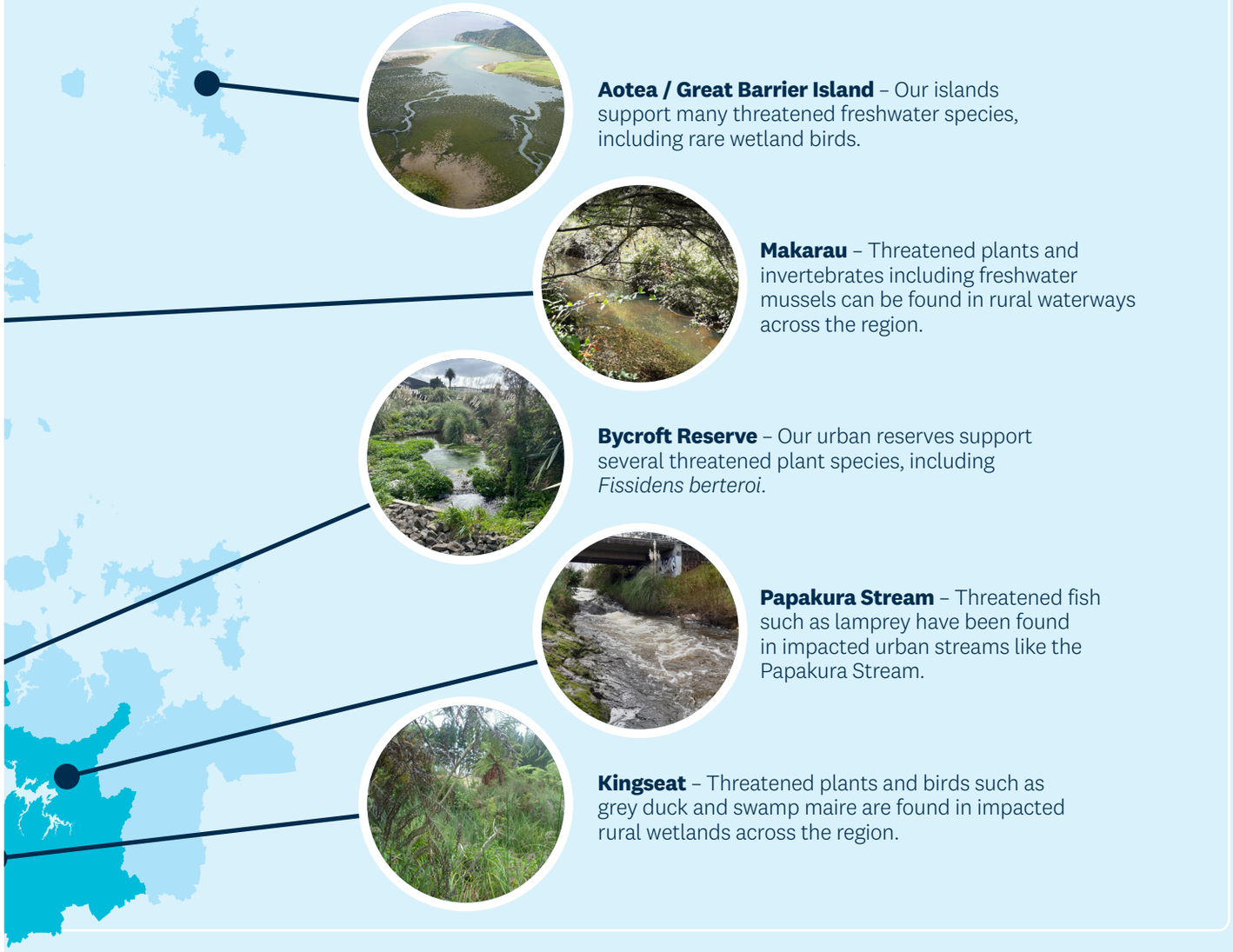
A range of management tools will be needed to protect the significant values of outstanding waterbodies, threatened species' freshwater habitat and natural inland wetlands. Relevant regulatory considerations include:

- Riparian edges, buffers and setbacks around waterbodies
- Stock access or fencing requirements
- Stream banks and bed disturbance: in-stream structures, channel clearance, etc.
- Vegetation management (both instream and riparian)
- Abstraction and diversion: maintenance of water flows and levels
- Discharges: water quality and impacts on habitat, including from stormwater and wastewater
- Land disturbance/earthworks: consideration may be needed of district plan as well as regional plan rules
- Land use activities: forestry, cultivation, infrastructure, landfill, etc.

Actions that will support habitat include:

- In-stream habitat enhancement including remediating barriers to fish passage and restoring connectivity
- Riparian and vegetation restoration and enhancement.





Aotea / Great Barrier Island – Our islands support many threatened freshwater species, including rare wetland birds.

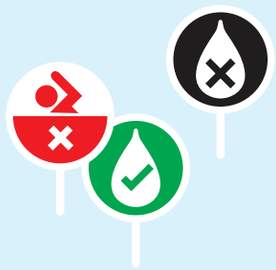
Makarau – Threatened plants and invertebrates including freshwater mussels can be found in rural waterways across the region.

Bycroft Reserve – Our urban reserves support several threatened plant species, including *Fissidens berteroi*.

Papakura Stream – Threatened fish such as lamprey have been found in impacted urban streams like the Papakura Stream.

Kingseat – Threatened plants and birds such as grey duck and swamp maire are found in impacted rural wetlands across the region.

13.5. Primary contact sites



Primary contact sites are freshwater sites that are regularly used for contact recreational activities, such as swimming. Improving water quality at primary contact sites will require the management of sources of *E. coli* in waterbodies and their catchments (see section 16).

We will be basing our identification of primary contact sites on the council's Safewim programme, and expanding the programme[4] to include more freshwater sites. The existing Safeswim freshwater sites are listed in Table 5. The freshwater sites listed in Table 6 are subject to further analysis and evaluation before they can be included on the Safewim website. They may not be suitable for swimming. Some sites like Glenveagh Stream and Opal Pools have hazardous access issues and might be added with a health and safety warning.

The draft environmental outcome for the Human Contact value proposes that water quality may not be prioritised in locations where contact recreation is inappropriate because of the public safety issues or risks to cultural values not being maintained. This could mean that the Hunua Falls and Waitipu (Waitākere Quarry) sites identified below as having permanent safety issues may not need catchment-specific *E. coli* management.

We know of several other popular freshwater swimming sites that have been inaccessible in recent years due to track closures related to Kauri Dieback (ie. Cascades, Fairy Falls and Wainamu Falls in the Waitākere Ranges). Some of the tracks, like the one to Karamatura Falls, have recently re-opened and will be considered for inclusion in Safeswim in future.



*Refer to freshwater consultation viewer for locations of the Safeswim sites**

Table 5: Freshwater swimming sites currently included on the Safeswim website.

	Status
1. Hunua Falls	'Do not swim' safety warning permanently in place.
2. Karekare Stream (carpark)	Check Safeswim for the latest information on water quality and water safety.
3. Lake Pupuke	Check Safeswim for the latest information on water quality and water safety.
4. Lake Wainamu	Check Safeswim for the latest information on water quality and water safety.
5. Little Oneroa Lagoon	Check Safeswim for the latest information on water quality and water safety.
6. Oakley Creek Waterfall	Long term water quality public health warning in place.
7. Waitangi Waterfall, Waiuku	Check Safeswim for the latest information on water quality and water safety.
8. Waitipu (Waitākere Quarry)	'Do not swim' safety warning permanently in place.
9. Onetangi Stream (Waiheke Is)	Long term water quality public health warning in place.

Table 6: Freshwater sites being assessed for future inclusion on the Safeswim website.

1. Glen Esk Stream	**8.** Matheson Bay Reserve Waterfall
2. Glenveagh Stream, Manurewa	**9.** Opal Pools, Karekare
3. Karekare Waterfall	**10.** Opanuku Stream (Candia Rd)
4. Kitekite Waterfall	**11.** Opanuku Stream (Mountain Rd)
5. Lake Rototoa	**12.** Okiritoto Stream
6. Lake Tomorātā	**13.** Orere River
7. McCreadies Paddock, Karekare	**14.** Warkworth Quarry

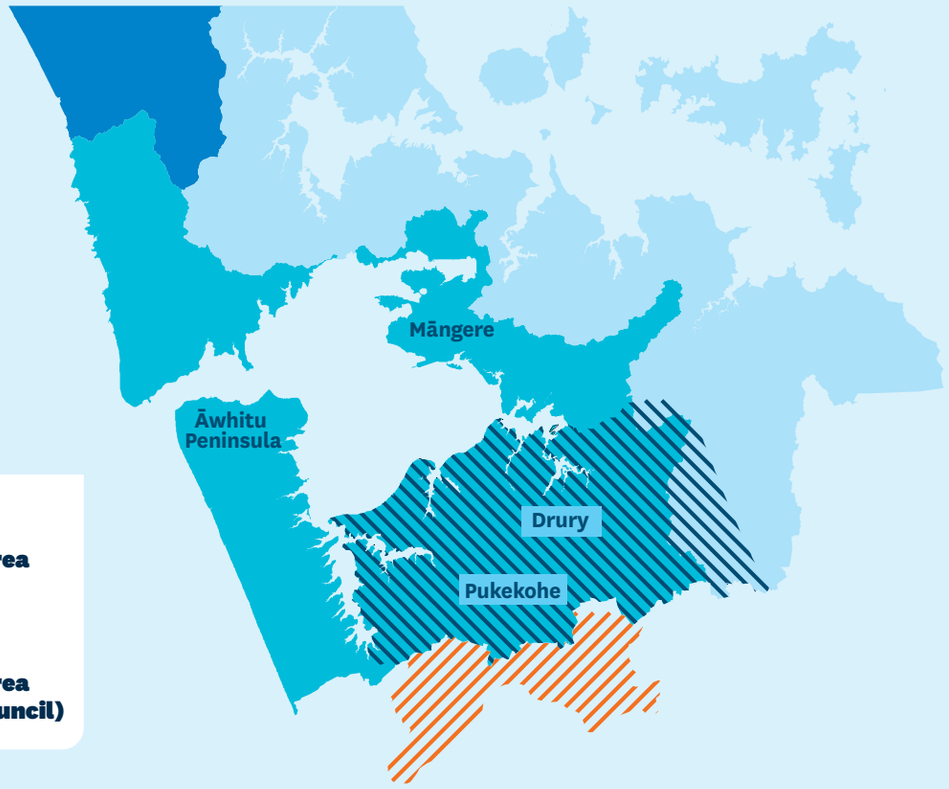
[4]www.safeswim.org.nz
*https://experience.arcgis.com/ experience/2ace51468f194466a0dd154bc0bd6c10

13.6. The Pukekohe Specified Vegetable Growing Area

The Pukekohe area is identified as a Specified Vegetable Growing Area in the NPS-FM because of its significance for national food security. It produces 26 per cent of Aotearoa's vegetables. The SVGA status means that special provisions apply, essentially allowing for a slower process for freshwater improvements. There are major issues with instream nitrate in several streams in the Pukekohe area. The boundaries of the SVGA are set within the NPS-FM but the council can determine how different management approaches should be applied throughout the area.

The management of nitrogen, principally from intensive horticultural activities, is addressed in section 18.

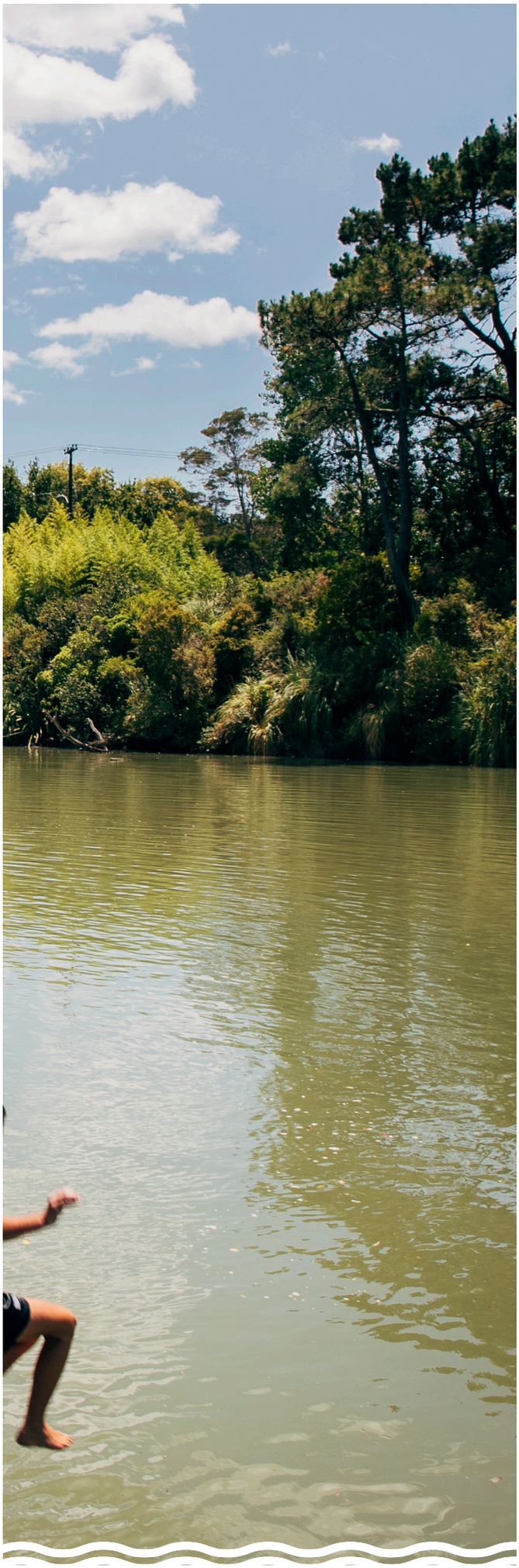
Figure 5: Map of the Pukekohe Vegetable Growing Area.





▲ Bombay





Part three: establishing our baseline for water quality

The following sections introduce freshwater attributes and flows, and the methods that we need to apply to achieve the vision, values and environmental outcomes proposed in previous sections.

◀ Swimming in Rangitopuni Stream, Riverhead



Once we have agreed a vision, values and environmental outcomes, we need to establish the baseline state of attributes. We need to then set targets and put in place methods to help us to achieve our aspirations.

For example, because we value being able to swim in rivers (the human contact value), we need to manage the attributes of freshwater that could make us sick, such as *E. coli* and cyanobacteria. This involves measuring the baseline state of *E. coli* and cyanobacteria, and establishing targets for improvement. Then, deciding limits and methods to meet the target and improve the environmental outcome. The process is explained in figure 6.

Figure 6. Figure shows the National Objectives Framework steps of establishing baselines, setting targets and putting in place limits and methods.

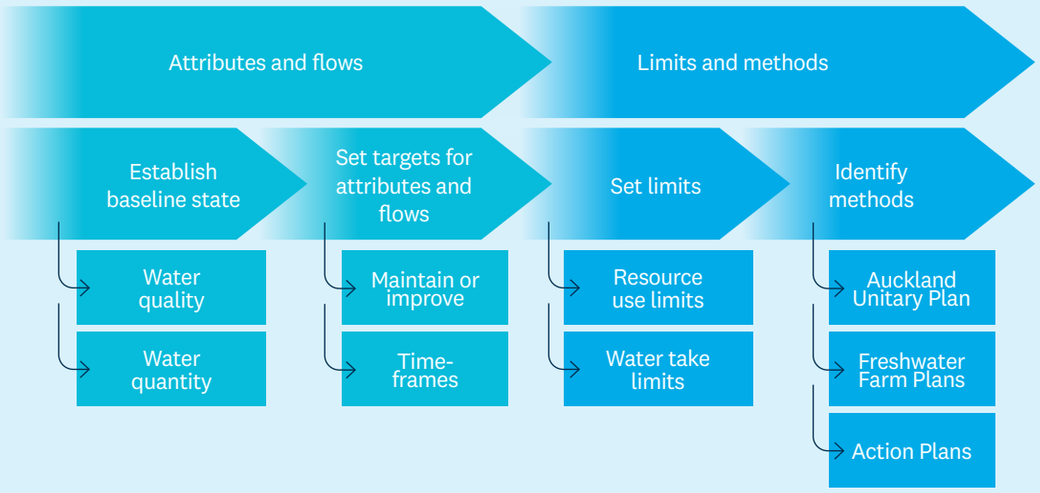


Table 7. Example of applying the NPS-FM to move from a value to methods

Value	***Environmental outcome***	***Attributes***	***Targets***	***Limits and methods***
Human contact	Water quality and water quantity in freshwater bodies provides for people to connect safely with water through swimming and other water-based activities, except in locations where the public safety or cultural values risks mean contact recreation is inappropriate.	*E. coli* (rivers and lakes) Cyanobacteria (lakes and lake-fed rivers)	Concentration and % of exceedances Concentration	• Rules for wastewater systems and discharges • Riparian management • Stock exclusion • Freshwater Farm Plans

The following tables summarise our approach to managing water quality and water quantity. We introduce the attributes that we want to manage, and their baseline states.

Table 8: Summary of approach and progress in implementing requirements to manage water quality and water quantity.

	NPS-FM requirements	***Where we're at***
Water quality	**Identify the freshwater attributes that we need to manage**	Included in this consultation
	Establish the baseline state for attributes	Included in this consultation
	Set targets for the attributes	General approach included in this consultation. Specific targets to be included in the Auckland Unitary Plan (AUP) plan change
	Set limits for resource use	Range of options included in this consultation. Detailed proposals to be included in the AUP plan change
	Identify methods	Range of options included in this consultation. Detailed proposals to be included in the AUP plan change
Water quantity	**Identify the flows and levels that we need to manage**	Issues identified in this consultation
	Set flows and levels for water quantity	Detailed proposals to be included in the AUP plan change
	Set take limits	Detailed proposals to be included in the AUP plan change
	Include limits as rules in the AUP, and other methods	Detailed proposals to be included in the AUP plan change



▲ Wood Reserve, Mt Roskill

14. Attributes for ecosystem health and human contact

The NPS-FM specifies 22 compulsory attributes, including nutrients, sediment, aquatic life, *E. coli*, and cyanobacteria, as they contribute to understanding how freshwater provides for the compulsory values of ecosystem health and human contact.



We have identified that we also need to manage zinc and copper (in urban streams) and temperature (in all streams) as essential attributes for ecosystem health in Auckland. Without including these attributes, we may not be able to achieve the overall outcomes we seek. Further decisions are necessary to confirm how these attributes will be adopted into the Auckland Unitary Plan, as they can be implemented as either limit setting and/or action planning attributes.

14.1. Attributes for water quality

Water quality is an essential component of freshwater ecosystem health. Nutrients, sediment, and metals are some of the main attributes we can measure for water quality. In a healthy freshwater ecosystem, these measures are in balance, and able to support indigenous aquatic life, such as macroinvertebrates, fish and native plants.

The state discussed here is a benchmark in time, what it was like in our rivers and lakes in 2017 – this is called the **baseline state** in the NPS-FM. The NPS-FM has a grading system for several key issues that are described by compulsory attributes. All regional councils and unitary authorities are trying to achieve a nationally consistent level of improvement. The grades are expressed as A-D bands. Band A = very good state, D = poor state. The trend through time tells us whether each attribute is getting better or worse.

The NPS-FM requires us to take action and make improvements if water quality is below a national bottom line which means it is already degraded, or if it is degrading and shows a worsening trend over time, unless this is due to natural causes. We must also consider the foreseeable impacts of climate change.

Our understanding of the state in each FMU for rivers and lakes gives us a sense of where changes in our activities or increased actions may be required to meet our agreed future environmental outcomes. For several key river attributes, we have both a measured assessment at long-term monitoring sites as well as a modelled assessment of the health or band for the 2017 benchmark. This

See Knowledge Auckland for more information on our freshwater reporting.

https://knowledgeauckland.org.nz/

gives us a more comprehensive assessment than monitored sites alone. Our current understanding of this 2017 starting point can differ for some attributes, or in some places, when utilising either our monitoring or modelling evaluations (and not all attributes can be easily modelled). There are many possible reasons for differences such as these and we will work with a panel of freshwater experts to refine our agreed baseline state assessment (our benchmark) prior to notifying the plan change in 2024.

14.2. Nutrients (lakes and rivers)

Nutrients such as nitrogen (including nitrate and ammonia) and phosphorus are essential for plant and animal growth. However, when excess nutrients run off into waterways, they can reduce oxygen levels due to excessive plant growth (eutrophication). At higher concentrations they can make waterways toxic for some aquatic life. When excess nutrients get into our groundwater, they can stay there for a long time, so what we put into our soils today may have an impact for decades to come.

Most nutrient enrichment in waterways comes from the activities we do on land. This includes fertiliser application, animal effluent discharge, and wastewater overflows.

We need to consider two aspects of excessive nutrients when managing our waterbodies, the toxicity effects on some aquatic life, and the effects of eutrophication.

River baseline state for the 2017 benchmark

Most of our region's rivers and streams are better than the national bottom lines for potential nitrogen toxicity effects (in the form of instream ammonia or nitrate). The majority of our region's rivers have concentrations generally well below those that can cause toxic effects to aquatic life (better than C band). For the majority of the region, the streams in A or B band show improving trends. This pattern is similar across each of the FMUs.

A small proportion of the region's urban rivers and streams grade in the C or D band for ammonia, which is worse than the national bottom line.

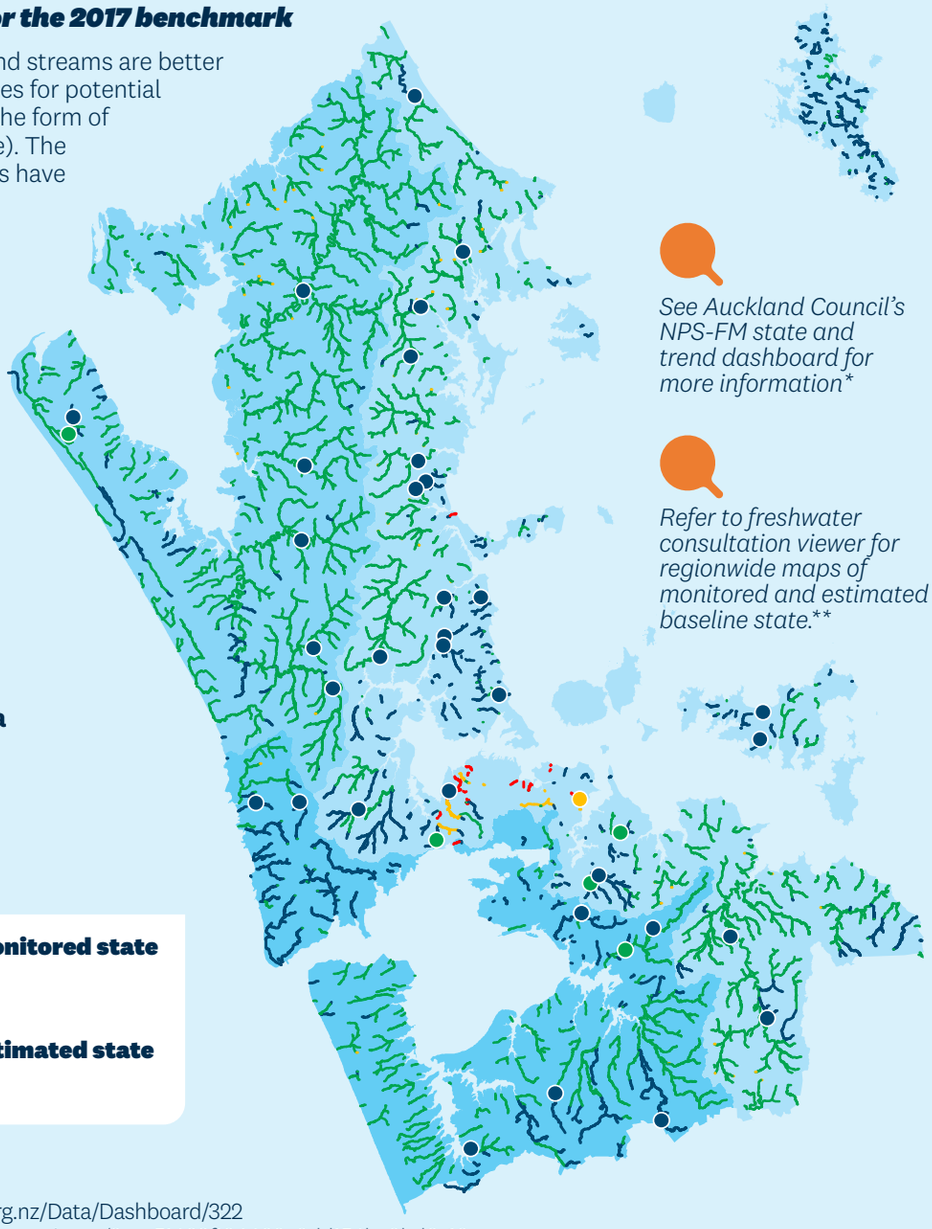
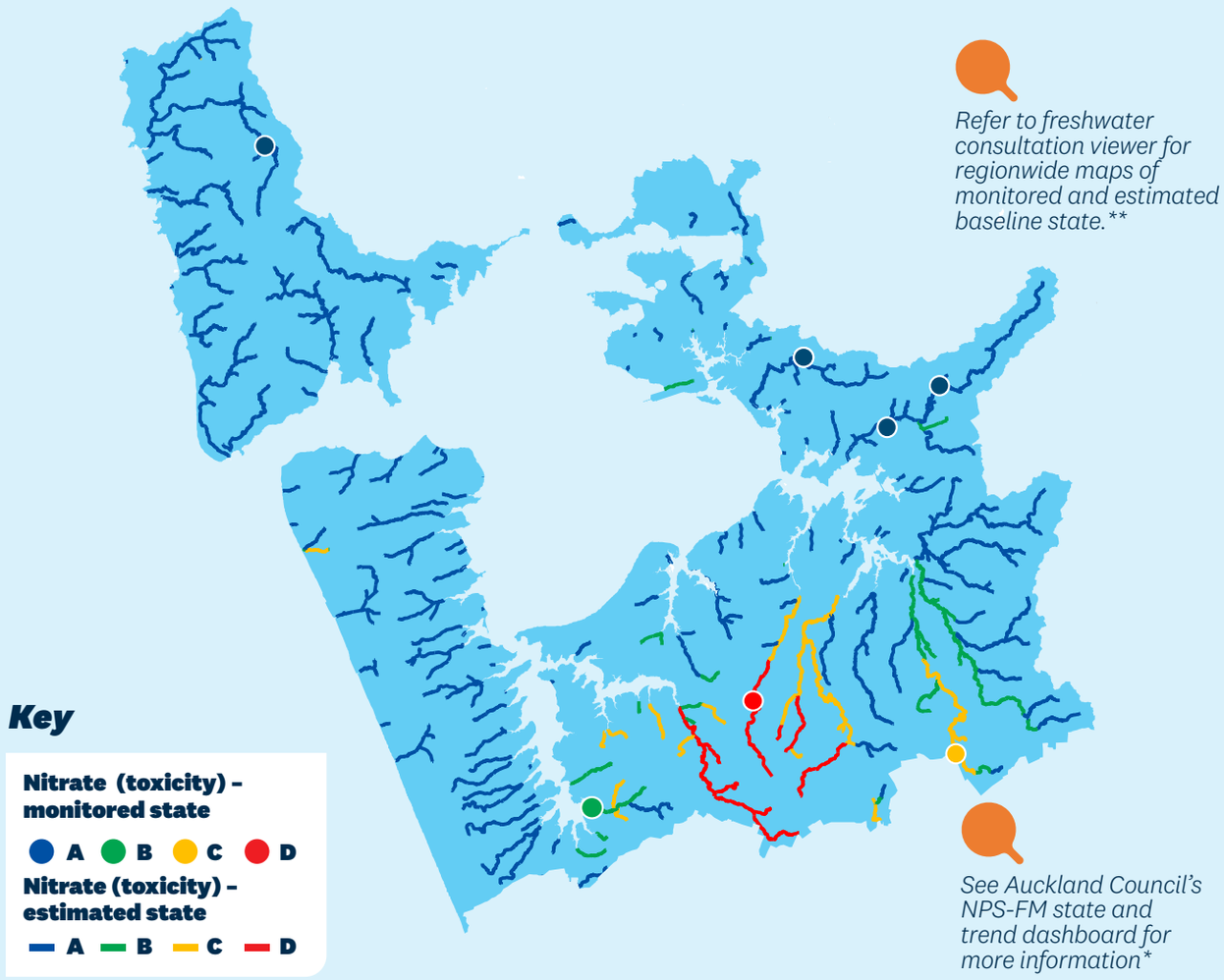


Figure 7: Monitored and estimated 2017 ammonia states for the region.

*https://environmentauckland.org.nz/Data/Dashboard/322
**https://experience.arcgis.com/ experience/2ace51468f194466a0dd154bc0bd6c10

The majority of the region's **rivers and streams** are also better than national bottom lines for nitrate toxicity effects (A or B band). Nitrate toxicity is generally confined to streams in the Pukekohe Specified Vegetable Growing Area, in the Manukau FMU. Several of the streams in this area have nitrate concentrations that are worse than the national bottom line (C band or worse). These streams generally receive a lot of their base flow from shallow basalt aquifers which also have higher than normal nitrate concentrations. These Pukekohe and Bombay streams are now showing some improving trends.

Figure 8: Monitored and estimated 2017 nitrate states for the Manukau FMU.



The measured dissolved reactive phosphorus (DRP) concentrations are high across the region's rivers, with no monitored sites grading in the A band. Most streams with urban and rural catchments were graded in the C or D band. No national bottom line exists for DRP as the Ministry for the Environment considers that one bottom line applied nationally risks being ineffective because DRP shows significant natural variation in different river types across the country. DRP may also be higher in streams co-located with volcanic geology.

We will also need to consider how to better manage these catchment nutrient loads to achieve improved outcomes for the region's estuaries. The generally high flushing rates of the shallow estuaries that dominate Auckland means we have not recorded problematic phytoplankton levels, but we know that nutrients can be a key stressor of coastal water quality, particularly in the sheltered upper reaches of estuaries.

*https://experience.arcgis.com/experience/2ace51468f194466a0dd154bc0bd6c10
**https://environmentauckland.org.nz/Data/Dashboard/322

Lake baseline state for the 2017 benchmark

Expanding our lake monitoring programme has revealed lower results for lakes than we previously knew about. Nearly all of the region's monitored **lakes** are better than the national bottom line (graded in A or B band) for ammonia toxicity, with the exception of Lake Kereta which is failing the national bottom line (sitting in C band). The nitrate toxicity attribute is not applied to lakes under the NPS-FM National Objective Framework.

About one-third of our lakes may be below national bottom lines for Total Nitrogen. Almost half of our lakes were in C or D band for Total Phosphorous (three of these lakes may be below national bottom lines). This excess nutrient may drive higher phytoplankton production for these lakes, and more recent state evaluation against the phytoplankton (Chlorophyll a) attribute identifies this is the case for about one third of our lakes.

Our lakes across the region generally have poor Dissolved Oxygen levels and are failing national bottom lines except lakes Tomarātā, Kereta and Pokorua.

Preferred direction

In some parts of our region we need to improve our activities on land to better manage nutrients that drain into our rivers and lakes.

Because of its significance for the domestic supply of fresh vegetables and New Zealand's food security, we have the option to set targets for nitrate and ammonia toxicity attributes (along with any related periphyton, macroinvertebrate and dissolved oxygen outcomes) below the national bottom line in streams in the Pukekohe SVGA. However, we must still make improvements in these outcomes over time.

*Refer to freshwater consultation viewer for regionwide maps of monitored baseline state**

Table 9: Preferred direction for future state for nutrients in Auckland's rivers and lakes.

	Baseline state	*Preferred direction*
Rivers (toxicity effects)	Ammonia toxicity	At least maintain where good (A or B band), the majority of the region is good.
	Nitrate toxicity	Improve where poor (C or D band), some urban streams in the Hauraki FMU.
Rivers (eutrophication effects)	Periphyton & DIN/DRP or TN/TP (nutrient outcomes)	Work still to be done to understand what is required across the region.
Aquifers (linked outcome)	Nitrates - Pukekohe SVGA: some shallow aquifers beneath intensive vegetable production.	Improve gradually where poor, without compromising domestic food supply.
Lakes (toxicity effects)	Ammonia toxicity	At least maintain where good (A or B band).
		Better understand the requirement to improve Lake Kereta.
Lakes (eutrophication effects)	Total Nitrogen	At least maintain where good (A or B band), Lakes Pupuke, Rototoa, Tomorātā and Wainamu.
		Improve where poor (C and degrading, or D band).
	Total Phosphorus	At least maintain where good (A or B band), Lakes Pupuke, Rototoa, and Tomorātā.
		Improve where poor (C and degrading, or D band).

14.3. Sediment (rivers)

Sediment naturally washes into waterways. The amount of sediment can be increased by human activities including vegetation clearance, earthworks associated with development, forestry and farming, and activities near or directly within waterways such as ploughing, livestock grazing and river crossings. Increased stormwater runoff can worsen instream bank erosion by increasing the flow in a river.

Suspended fine sediment reduces visibility in waterways, impacting plant growth and decreasing the ability of aquatic life to find food and detect predators. Where freshwater flows aren't powerful enough to flush sediment away, it gets deposited on river and stream beds. Muddy stream beds can degrade habitats, reduce food for instream life, and change the flow and depth of rivers. Sediment that is transported through water movement may lead to impacts on coastal receiving environments (e.g. estuaries).

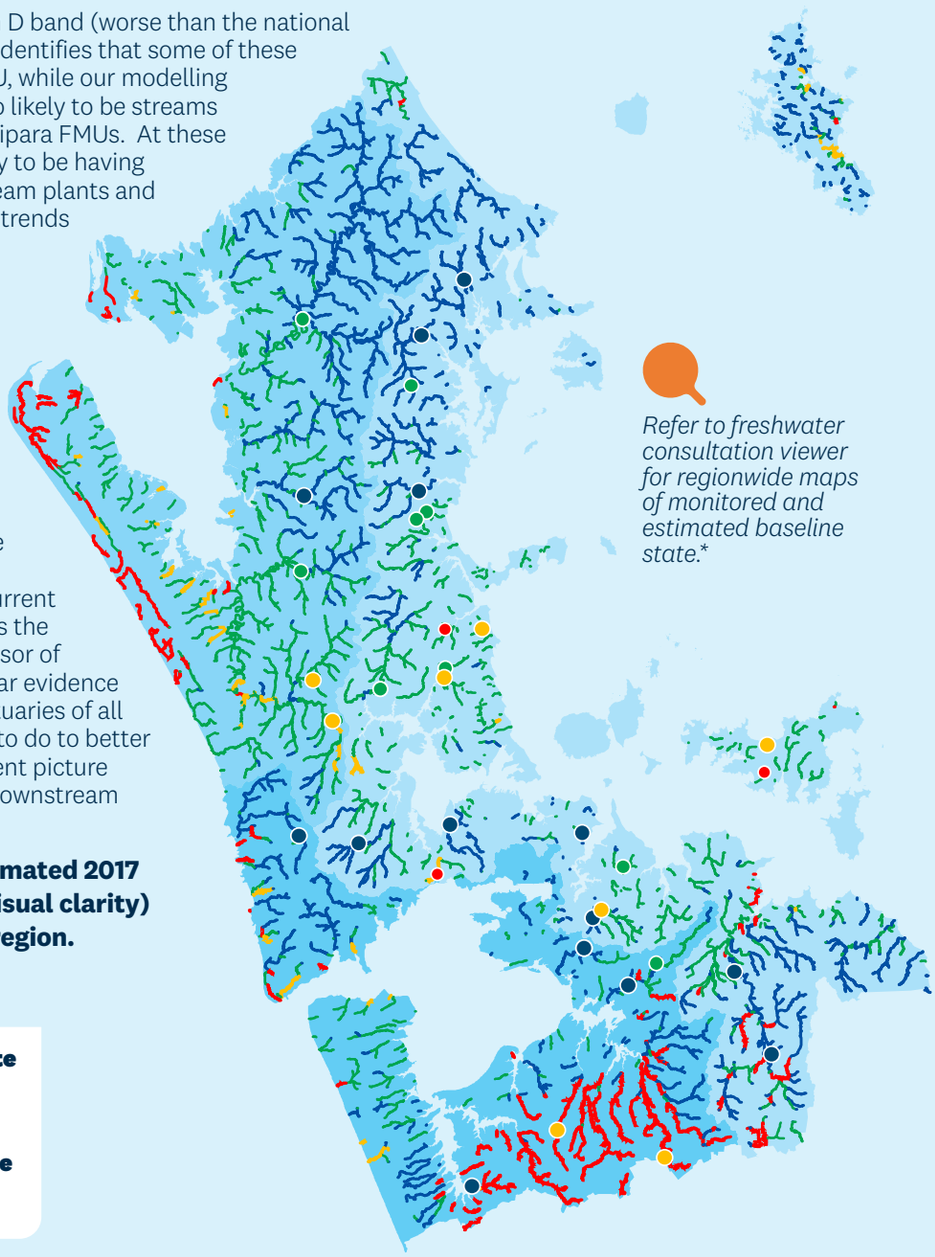
Baseline state for the 2017 benchmark

Suspended Fine Sediment

Over half of our region's **rivers and streams** are better than the national bottom lines for suspended fine sediment. This is defined by the visual clarity median state, which is the state aquatic life experience instream 50% of the time.

Some of the region's rivers grade in D band (worse than the national bottom line). Our monitoring data identifies that some of these failing rivers are in the Hauraki FMU, while our modelling suggests additionally there are also likely to be streams failing in both the Manukau and Kaipara FMUs. At these levels, suspended sediment is likely to be having moderate to high impacts on instream plants and animals. Suspended fine sediment trends across the region indicate that over half of the river monitored sites show improving trends.

Large wet weather events can contribute harmful pulses of sediment that may not be reflected in this river suspended fine sediment baseline assessment. These additional loads of sediment are harmful to our downstream estuaries, an issue that we recognise is important to Aucklanders. Our assessment of current coastal state identified sediment as the biggest and most widespread stressor of benthic environments. There is clear evidence of sediment impacts across the estuaries of all three FMUs. We have further work to do to better understand this suspended sediment picture for our region, both for rivers and downstream estuaries.



▶ **Figure 9: Monitored and estimated 2017 suspended fine sediment (visual clarity) states for rivers across the region.**

Deposited fine sediment

We can't provide a 2017 baseline state for deposited fine sediment in the region's wadeable streams. Recently established river monitoring will be used in the future to form an assessment of the state.

Preferred direction

In several parts of our region we need to improve our activities on the land to better manage sediment entering our rivers and streams. This is reflected in the assessment below. We also need to consider how to better manage these catchment sediment loads to achieve improved outcomes for our estuaries, where a lot of this sediment ends up.

Table 10: Preferred direction for future state for sediment in Auckland's rivers.

	Baseline state	*Preferred direction*
Rivers 	Suspended fine sediment (visual clarity)	At least maintain where good (A or B band), this is the state in over half of the region.
		Improve where poor (C and degrading, or D band).
	Deposited fine sediment (wadeable rivers)	Unable to be assessed at this time.
Estuaries (linked outcome) 	Sediment load delivered to estuaries	Work still to be done to understand what additional load management is required to support aquatic life outcomes for the region's estuaries.

14.4. Copper and zinc (urban rivers)

Copper and zinc can be toxic to bugs and insects (macroinvertebrates) and fish when concentrations are high. These metals have been recognised as key contaminants, particularly in urban rivers, however they haven't been included as nationally compulsory attributes in the NPS-FM. Auckland Council (along with other councils with larger urban areas) is proposing to improve the management of copper and zinc in our urban waterways by including these as additional attributes for our region.

Copper and zinc occur naturally in our streams based on catchment soil type and geology. These metals can accumulate in sediments and living organisms. They are transported into waterways by stormwater from roads (zinc from tyre wear, copper from brake pad wear), and roofs (zinc from galvanised roofing), and other impervious surfaces including paved areas around industrial sites.

Baseline state (a more recent monitored 2022 benchmark)

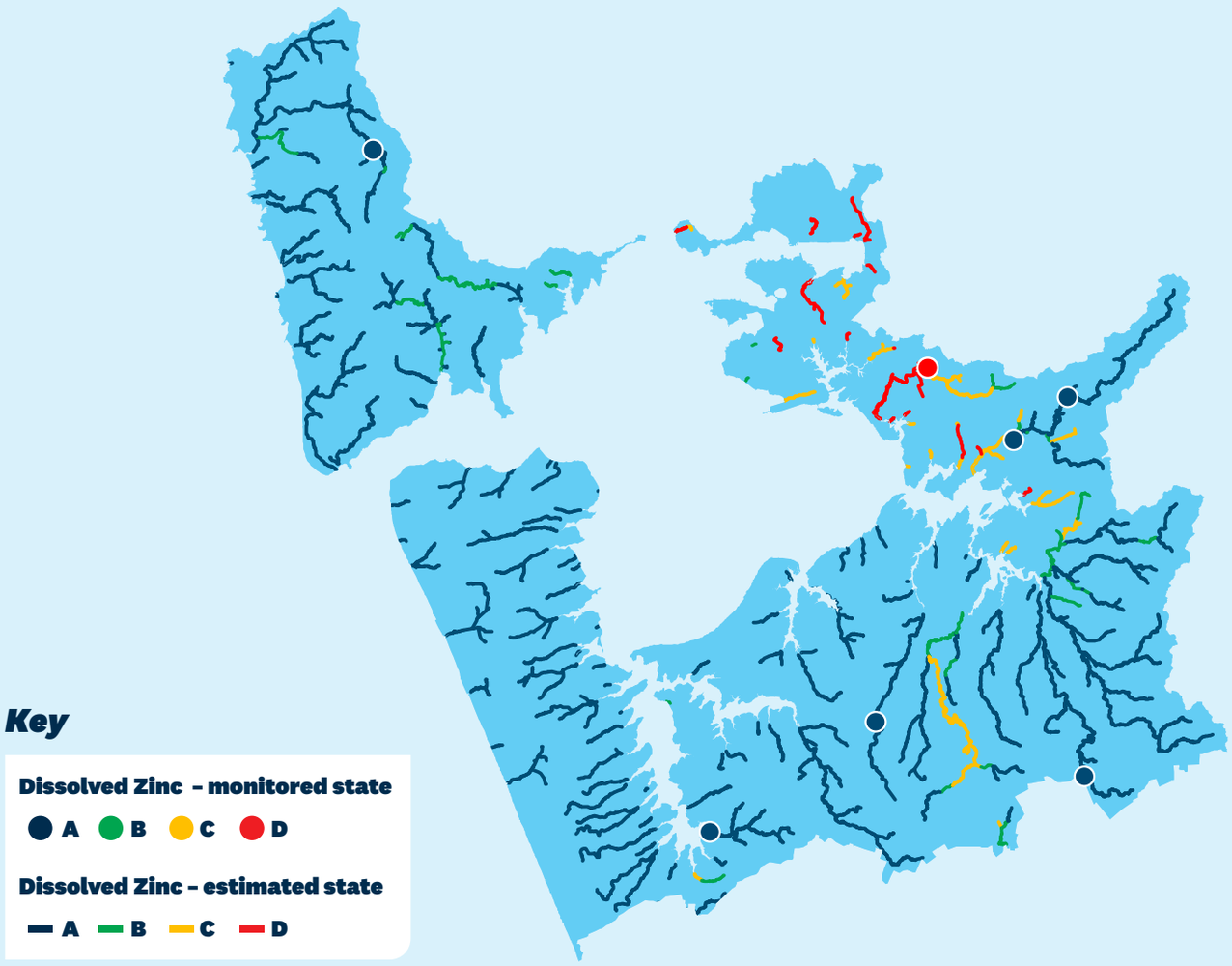
Work is underway to develop an attribute band table for regional use focusing on the dissolved components of these metals. This is based on the Australia and New Zealand Fresh Water Quality Guidelines update for chronic copper and zinc toxicity in freshwater. This incorporates a bioavailability focus similar to that used for ammonia toxicity. Grading is therefore considered provisional at this time, but indicates the scale and spread of the issue for the region.

Provisional grading identifies that when we focus on urban streams across the region, dissolved zinc is more of an issue than dissolved copper in terms of potential toxicity effects on aquatic life. This issue is apparent in both the Hauraki and Manukau FMU urban streams, where eight sites fail the provisional regional bottom line. Trends for copper are generally degrading while trends for zinc are generally improving.



*See Auckland Council's NPS-FM state and trend dashboard for more information***

*https://experience.arcgis.com/experience/2ace51468f194466a0dd154bc0bd6c10
**https://environmentauckland.org.nz/Data/Dashboard/322



▲ **Figure 10: Monitored and estimated 2017 zinc states for the Manukau FMU.**

Preferred direction

In some of our urban streams across the region we need to better manage our activities on land to prevent copper and zinc entering our streams. These metals can also get transported with sediment out into our nearshore coastal environments.

Table 11: Preferred direction for future state for zinc and copper in Auckland's urban rivers.

	Baseline state (2022)	***Preferred direction***
Rivers (urban)	Dissolved Copper	At least maintain where good (A or B band).
		Improve where poor (C band, or D band).
	Dissolved Zinc	At least maintain where good (A or B band).
		Improve where poor (C band or D band).

15. Aquatic life and habitats supporting ecosystem health

Aquatic life describes the abundance and diversity of invertebrates, plants, fish and birds. Habitat describes the physical form, structure, and extent of the water body, its bed, banks and margins, its riparian vegetation, and its connections to floodplains and to groundwater.

The attributes we measure are:

- Macroinvertebrates community index (MCI & QMCI) and average score per metric (ASPM), fish, and shading (temperature) in our rivers
- Submerged plants (both native and invasive species) in our lakes.



▲ Kōura, freshwater crayfish

15.1. Macroinvertebrates in wadeable streams

Macroinvertebrates include small organisms such as insect larvae, snails, and worms which live on the beds of our streams, and adult mayflies, caddisflies and beetles. Macroinvertebrates feed on algae, aquatic plants, dead leaves, and wood, and are an important source of food for birds and fish. The type of streamside vegetation and land use in a stream's catchment, whether forest, pasture or urban, have a significant influence on the composition and overall health of macroinvertebrate communities.

Stream macroinvertebrate composition reflects a wadeable stream's water and habitat quality and can give a cumulative picture of its state of health.

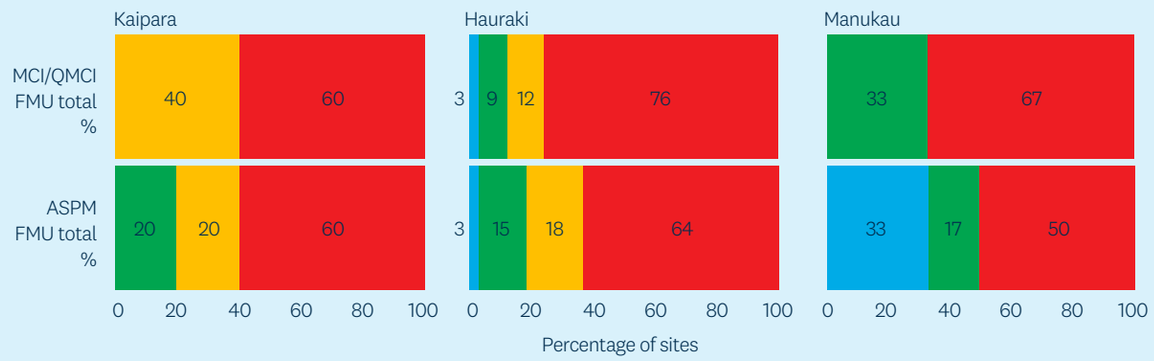
Baseline state for the 2017 benchmark

The successful functioning of macroinvertebrate communities is severely altered in heavily-modified urban and higher intensity rural catchments. For these land cover classes almost all sites fail the national bottom lines (D band). This indicates that land use activities and associated river habitat and flow modification are adversely impacting instream habitat and riparian vegetation quality, and water quality. Low diversity macroinvertebrate communities in urban waterways often reflect the habitat oversimplification that comes from channelising and concreting waterways.

Many native and exotic forested river sites are above the national bottom line and fall into either the A or B bands. They also have higher numbers of pollution intolerant macroinvertebrates. However, some of the native forested sites also fail the national bottom lines.

Over half of all sites across the region show degrading trends in macroinvertebrate community health. Urban sites exhibit the highest proportion of degrading trends across the region. Approximately one-third of sites show improving trends, evenly distributed among land use types.

Figure 11: Monitored states for MCI attributes for aquatic life in wadable rivers, across the three FMUs.



Key **NPS-FM Grade** A B C D

*See Auckland Council's NPS-FM state and trend dashboard for more information**

Preferred direction

This attribute relies on improvement in other attributes like sediment and nutrients. We will also need to take additional actions to improve the streamside (riparian) planting required to support these communities.

Table 12: Preferred direction for future state for MCI in Auckland's wadeable rivers.

	Baseline state	Preferred direction
Wadeable Rivers	MCI/QMCI	At least maintain where good (A or B band), generally in forested catchments.
		Improve where poor (C and degrading or D band), generally in rural and urban catchments.
	ASPM	At least maintain where good (A or B band), generally in forested catchments.
		Improve where poor (C and degrading or D band), generally in rural and urban catchments.

15.2. Fish in wadeable streams

Wadeable streams in the Auckland region support 16 native freshwater fish species, many of which are at risk or threatened. Streams containing varied fish communities often have diverse instream habitat and intact riparian cover, such as shading. Many of the same factors that affect macroinvertebrate health also affect fish health. For example, an excess of sedimentation can damage fish gills and degrade habitat. Introduced fish species can also have a negative impact on native fish populations in rivers by competing for food and habitat resources, and by predation.

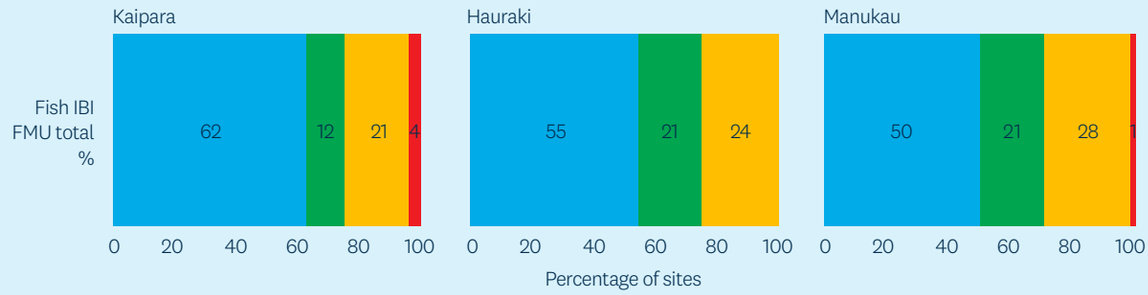
Unimpeded fish passage up streams is critical for some native freshwater fish species. Many species need the environmental conditions that stream headwaters provide to breed and hunt for food. Several fish species need to migrate between fresh and saltwater to complete their life cycle. The distribution of native fish in our rivers and streams is strongly influenced by both natural and artificial barriers to migration, including built structures like culverts and weirs, and by changes to a stream's flow such as when stormwater quickly runs into streams from roads.

The NPS-FM uses the fish Index of Biotic Integrity (IBI) to assess the condition of fish communities in wadeable rivers, and as a measure of habitat quality and migratory access. There is no national bottom line for this attribute. An improved understanding of trends in changes to the composition of freshwater fish communities across the region will be informed by ongoing surveys of wadeable streams.

Baseline state at 2017 benchmark

Measured fish data indicates that freshwater fish community health is better in forested areas and worse in rural and urban areas. There appears to be little difference in grading between the three FMUs, with the Manukau FMU showing a slightly higher proportion of sites in the C and D band.

Figure 12: Provisional monitored state for fish IBI attribute for aquatic life in wadable rivers, across the three FMUs. There is no national bottom line for this attribute.



Key **NPS-FM Grade** A B C D

*See Auckland Council's NPS-FM state and trend dashboard for more information**

Preferred direction

As there is no national bottom line for the Fish IBI attribute in wadeable rivers, the council must look to improve fish outcomes through action planning. The council has a fish passage action plan in development.

Table 13: Preferred direction for future state for fish in Auckland's wadeable rivers.

	Baseline state	Preferred direction
Wadeable Rivers	Fish Index of Biotic Integrity	Improve where practicable and continue to monitor fish communities and develop an understanding of trends through time. Incorporate understanding of trends into the fish action plan as they are identified.

*https://experience.arcgis.com/experience/2ace51468f194466a0dd154bc0bd6c10

15.3. Riparian Habitat (Temperature)

Increased stream water temperature can have significant impacts on ecosystem health and aquatic life. Increases in temperature can:

- contribute to less dissolved oxygen in our water, which is critical for ecosystem health and function
- adversely impact fish behaviour, metabolism and diet, in severe cases increased temperatures are lethal to fish
- increase the growth rates of aquatic plants
- adversely impact macroinvertebrates

An increase in temperature can be due to a loss of shade from the removal or lack of riparian planting, warm water entering streams, such as from roads and concrete surfaces, and reduced water flow in streams so that the remaining water volume is more easily warmed up. Aside from providing food and shelter, riparian (streamside) planting can also regulate water temperature, making the stream more hospitable to fish and insects while minimising the risk of choking algae blooms.

Although there is no nationally compulsory attribute for river water temperature, we are looking to include this as an additional attribute for our region. Increased water temperature has been identified as a significant issue, especially in the many smaller streams across the Auckland region. We have proposed a regional attribute table for mean and maximum temperatures with a regional bottom line below the C band.

Baseline state at 2017 benchmark

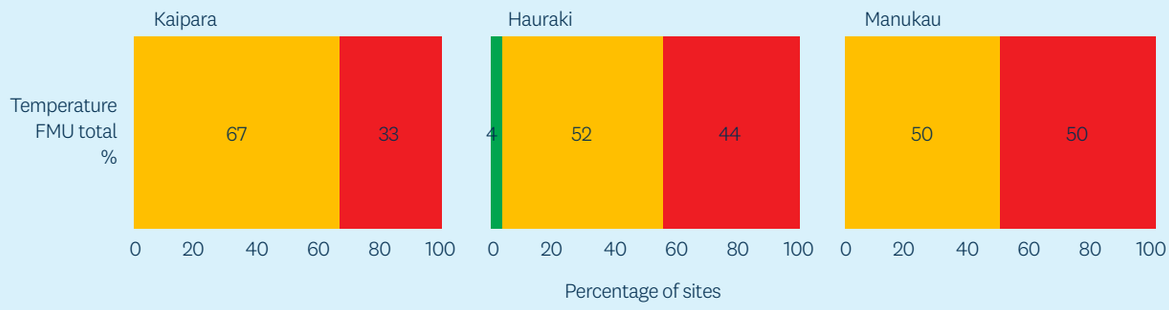
There is thermal stress to aquatic life in both urban and rural streams with many streams failing the regional bottom line. We are working to understand the extent of this issue along with long term trends.

Preferred direction

Table 14: Preferred direction for future state for temperature in Auckland's rivers.

	Baseline state	Preferred direction
Rivers	Temperature	At least maintain where good (A or B band)
		Improve where poor (C or D band)

Figure 13: Provisional monitored state for temperature attribute for rivers, across the three FMUs.



Key **NPS-FM Grade** A B C D

*See Auckland Council's NPS-FM state and trend dashboard for more information**

15.4. Lake submerged plants

Submerged plants perform vital ecosystem functions that help maintain overall lake health. The Native Condition Index describes the diversity and extent of submerged indigenous plant communities, and the Invasive Impact Index describes the nature and amount of submerged invasive weed species. A high percentage of submerged native plants are indicative of healthy ecological lake conditions and ongoing invasive species management.

Typically, healthy lakes would have diverse but stable submerged native plant communities. Currently, submerged plants face a number of threats, including pest fish browsing, displacement of native submerged plants by invasive exotic species, and excess nutrients in lakes favouring exotic species. This has resulted in a loss, or near collapse, of most submerged native plant communities in Auckland's lakes.

Lake baseline state for the 2017 benchmark

Most of the region's monitored lakes are worse than the national bottom line (band C) for the Native Condition Index except for Lakes Rototoa, Whatihua and Pokorua (band B).

Several of the region's shallow lakes may in fact be non-vegetated, namely lakes Tomorātā, Slipper and Spectacle, meaning they aren't graded.

All of the region's monitored lakes are in band C or D for the Invasive Impact Index. Lakes in band D are below the national bottom line, including Lakes Kuwakatai, Pehiakura (big), Kereta and Te Kanae.

This provides an indication that many of the region's lakes are moderately to highly impacted by invasive plant species.

*See Auckland Council's NPS-FM state and trend dashboard for more information**

Preferred direction

In general, we need to improve the health of our lakes through improved pest fish, invasive plant and nutrient management.

Table 15: Preferred direction for future state for submerged plants in Auckland's lakes.

	Baseline state	Preferred direction
Lakes	Native Condition Index	At least maintain where good (B band), namely Lakes Rototoa, Whatihua and Pokorua.
		Improve where possible if poor (C and degrading or D band).
	Invasive Impact Index	Improve everywhere (C and degrading or D band).





*https://experience.arcgis.com/experience/2ace51468f194466a0dd154bc0bd6c10

16. Human contact in our lakes and rivers

People value being able to connect with the water through activities such as swimming, waka, boating, canoeing, fishing, and mahinga kai. We measure two attributes that can impact human health when we interact with our freshwater bodies: *E. coli* and planktonic cyanobacteria (blue/green algae). Other matters we might consider when we make choices about interacting with freshwater bodies include the presence of pathogens, water clarity and deposited sediment to assess hazards underfoot and instream or lake plant growth (periphyton can be slippery underfoot and macrophytes may cause entanglement), evidence of other toxicants, and the presence of litter.

16.1. *E. coli*

E. coli is an indicator of the presence of faecal contamination in freshwater. This can cause gastroenteritis, respiratory illness, and ear and skin infections. The key sources of faecal contamination of waterbodies are animal excrement (including birds), effluent and wastewater discharges, and stormwater run-off and discharges.

There is no national bottom line for *E. coli*. Instead, the NPS-FM directs constant improvement towards A band everywhere, over time.

The NPS-FM also sets national targets for 80% of New Zealand's larger rivers and lakes to be suitable for primary contact by 2030, and 90% by 2040.

Management of specific freshwater 'primary contact' sites is also discussed in other parts of this document.

River baseline state to 2017

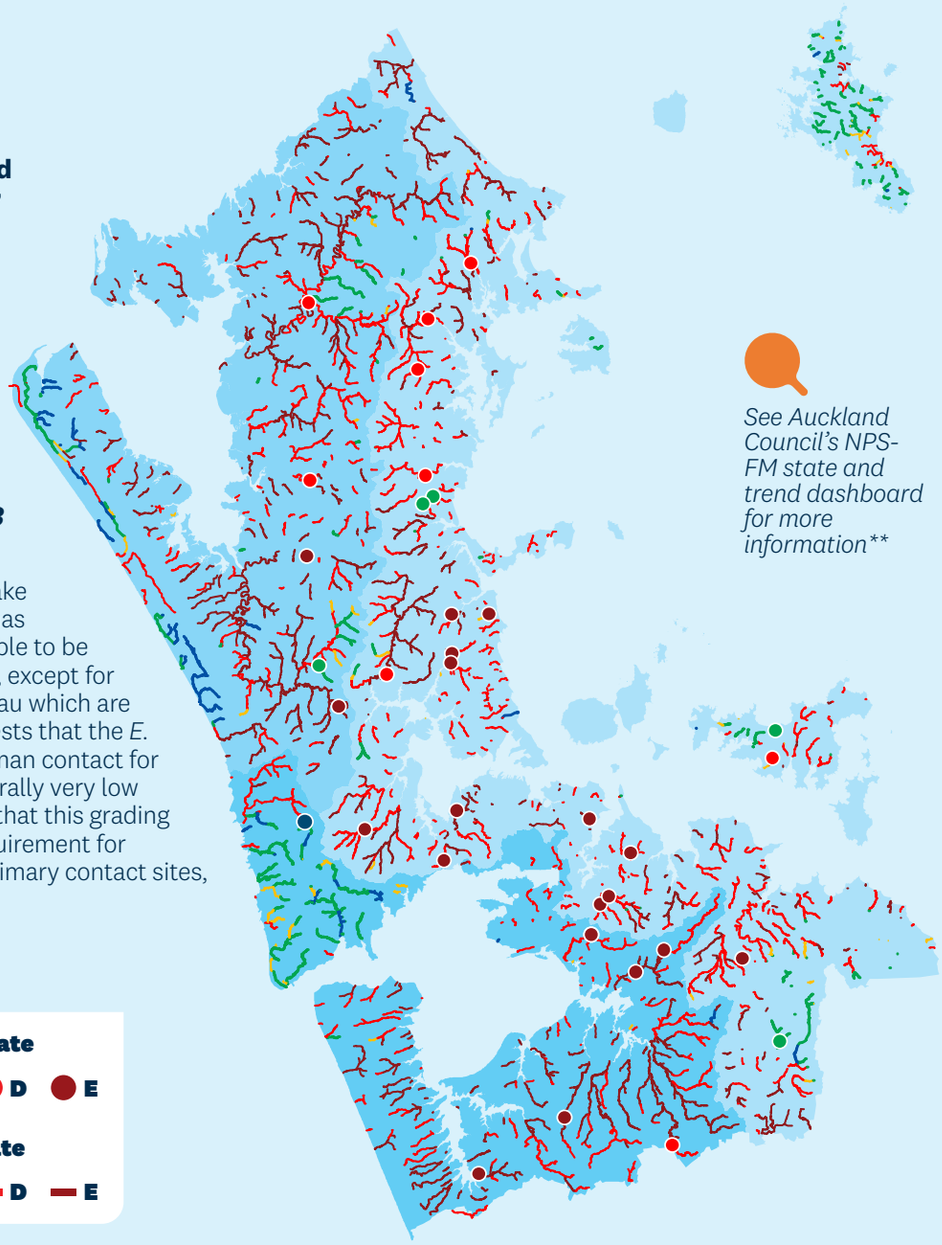
Levels of *E. coli* contamination are generally high in the region's rivers and streams, meaning potential human health risks are widespread. The majority of the region's streams in urban catchments were graded as band E across all FMUs, while rural rivers were either graded in band D or E at about equal proportions. The underlying metrics indicate that *E. coli* is elevated half of the time in these urban and rural rivers. Native forest dominated catchments graded in bands A or B. Across the region trends in *E. coli* show about equal improving or degrading trends.



*Refer to freshwater consultation viewer for regionwide maps of monitored and estimated baseline state**

*https://experience.arcgis.com/experience/2ace51468f194466a0dd154bc0bd6c10

▶ **Figure 14: Monitored and estimated 2017 *E. coli* states for rivers in the Auckland region.**



*See Auckland Council's NPS-FM state and trend dashboard for more information***

Lake baseline state (a more recent 2023 benchmark)

Our recently expanded lake monitoring programme has identified that all lakes able to be graded are in the A band, except for lakes Pokorua and Okaihau which are in the B band. This suggests that the *E. coli* risk in relation to human contact for the region's lakes is generally very low across the region. (Note that this grading does not replace the requirement for regular surveillance at primary contact sites, see section 13.4).

Key

***E. coli* – monitored state**

A B C D E

***E. coli* – estimated state**

A B C D E

Preferred direction

Reducing the human health risk relating to faecal contamination to waterways is a high priority for mana whenua, Aucklanders and the council, for both freshwater and coastal sites.

We propose to decrease the level of *E. coli* in our rivers and streams and maintain the quality of our lakes to better manage the average risk of infection for our communities.

Table 16: Preferred direction for future state for *E.coli* in Auckland's waterbodies.

	Baseline state	***Preferred direction***
All rivers	*E. coli*	Maintain where A band.
		Improve gradually where below the B band (B and degrading), timeframes for targets may reflect the scale of the improvement required.
All Lakes	*E. coli*	At least maintain where good (A or B band).

** https://environmentauckland.org.nz/Data/Dashboard/322

16.2. Cyanobacteria in lakes

In lakes, we need to manage the risk to human health from potentially toxin-producing planktonic cyanobacteria. Cyanobacteria are naturally occurring blue-green algae. When it gets too hot, or there are too many nutrients in a lake, the algae can form blooms that produce toxins which are hazardous to human health. During blooms this may be observed as scum on the water surface. Animals, particularly dogs, are also susceptible to these toxins.

Baseline state (a more recent 2023 benchmark)

We currently have a state assessment for six of the region's lakes, with further interim assessments for another seven lakes. All publicly accessible lakes have low bio-volumes of cyanobacteria, which presents a low exposure risk (band A and B). The interim states show several lakes in the region have levels of cyanobacteria worse than the national bottom line, with potentially higher health risks from exposure to cyanobacteria.

Preferred direction

We propose to set targets and work to maintain low levels of planktonic cyanobacteria and reduce levels where needed.

Table 17: Preferred direction for future state for Cyanobacteria in Auckland's lakes.

	Baseline state	Preferred direction
Lakes	Planktonic cyanobacteria	Maintain where good (A band)
		Report on other additional lake grades in mid-2025 and identify next steps to achieve the required scale of improvement.

Management options

In general, it will be necessary to manage the nutrient (nitrogen and phosphorus) loads that discharge into lakes from their surrounding catchments to ensure that lakes achieve planktonic cyanobacteria objectives. The approach to defining a resource use limit and management actions is likely to be similar to that required for the lake trophic state attributes.



▲ Lake Slipper

▶ Lake Pupuke


7
Southern Cross Travel Insurance
CAMPBELLS BAY SCHOOL





Part four: targets and methods to get us to our water quality goals

◀ Helensville Riverside Walk

17. Proposed approach to target setting for attributes

Specific targets for each attribute will be set after our baseline assessment is further refined, in time for the 2024 plan change.

We would like to understand community aspirations for maintenance and improvement, and the timeframes we should be aiming for:

- Is the national bottom line an adequate level for Tāmaki Makaurau, or should we aspire to do better and set targets to improve in all attributes? Mana whenua have said that our freshwater systems should be improved wherever they have been impacted by human activities. That could include waterbodies where the attributes are above national bottom lines but not of the highest quality.
- How quickly should we make change? We know that some attributes, such as *E. coli*, may take generations to improve. We can put more effort into these areas, particularly through increasing investment into action plans, but we will need to decide how much we can achieve with the available tools and funding. Regulatory change could have cost impacts for individuals.

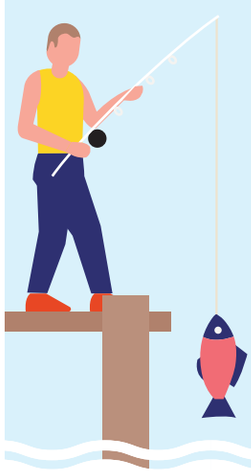
Targets in the Pukekohe Specified Vegetable Growing Area

The SVGA that is in place for Pukekohe provides an exemption, allowing us to set targets below the national bottom line for nitrogen and other attributes impacted by nitrogen. We expect that the targets for this area will be set to stop further degradation and progressively improve in the long term. Interim targets, for example every ten years, will ensure actions are in place to achieve the long-term management outcomes.

Achieving the targets

For limit-setting attributes where we set targets to improve, we plan to use a **load reduction approach**. This means reducing the amount of an attribute that is released into waterways over time. We are considering the use of proportional load reductions (as opposed to absolute loads) reflecting the nature of the tools currently available to Auckland Council as the resource manager. We expect these tools to improve over time. We'll also need to adapt our management approach over time to have regard to the foreseeable impacts of climate change.

Many of the action plan attributes will require additional measures to achieve our goals. For example, riparian (waterside) planting improves the shading of streams, reduces water temperature, and also helps to filter out sediment and nutrients as they drain towards a waterway. Improved management of pest plant species being transferred between lakes will help improve the communities of native plants.



18. Achieving the targets: limits and action plans for water quality and ecosystem health

The NPS-FM requires Auckland Council to identify and develop the management tools that will be used to achieve the targets that have been set for water quality attributes. These tools include regulatory **limits on resource use** (land use controls, input controls and output controls in the Auckland Unitary Plan (AUP)), and non-regulatory **action plans** and other voluntary measures such as investment programmes and actions by the council.

We need to review the AUP's existing objectives, policies and rules for their adequacy against the requirements of the NPS-FM and, where appropriate, notify changes to the plan. This needs to be done by the end of 2024, and will build on the 2022 review of the effectiveness of the AUP's water-related provisions (see AUP s35 monitoring report*).

There is no required timeframe for action plans. Some are already underway. Others will be progressed once the plan change is in place.

National requirements for some activities

New national requirements have been introduced for some activities and need to be applied to activities alongside the provisions of the AUP. These requirements are expected to make a positive contribution to achieving our vision, values and environmental outcomes. Where it makes sense, we will integrate the national provisions into the AUP so that it is easier to follow the two sets of requirements.

National requirements include (but are not limited to):

- Excluding stock from rivers (over 1 metre wide), lakes and wetlands
- Limiting the amount of synthetic N-Fertiliser applied to pastoral farms, along with reporting requirements for dairy farms
- Controls on vegetation clearance, earthworks, water takes, diversions and discharges within and close to rivers, streams, lakes and wetlands
- Controls on new structures in rivers to provide for fish passage
- Controls on intensive winter grazing on forage crops – subject to conditions or consent required
- Requirements for plantation forestry including practice requirements for earthworks, harvesting and slash
- Requiring certified Freshwater Farm Plans. In Auckland this is expected to be phased across the 3 FMU's, starting with Kaipara FMU which will require farmers to submit their Freshwater Farm Plans for certification by 1st May 2026. (See box on page 65)
- Introducing new controls for specific high-risk activities within drinking water source protection areas (amendments to the existing regulations are expected to be introduced in 2024).

*https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/unitary-plan/docsunitaryplanmonitoringtechnical/b7.3-freshwater-systems.pdf

18.1. Management tools under consideration

The Auckland Unitary Plan has a comprehensive range of provisions that aim to protect Tāmaki Makaurau's water resources, including objectives, policies, rules and other methods. In 2022 we undertook an assessment of the effectiveness of the provisions of the AUP in meeting its stated freshwater objectives. We concluded that while the provisions address all the relevant matters, there is still degradation of waterways occurring and therefore further improvements are necessary.

As well as integrating the new national requirements, discussed above, we can consider whether higher standards, above national requirements, would be appropriate in Tāmaki Makaurau. The following sections outline a range of possible regulatory and non-regulatory approaches under consideration for achieving water quality outcomes.

Use of riparian margins (urban and rural)

- Evaluate whether existing provisions are sufficient for riparian margins (buffers) between land use activities and waterways. Buffers help reduce erosion, stabilise riverbanks, intercept nutrients (rural) and contaminants (urban stormwater), provide wildlife habitat and provide shade to bring down water temperature.
- Where riparian margins exist, ensure their protection and revegetation and on-going maintenance.
- Ensure structure planning and plan making provide for riparian margins that are sufficiently wide to allow rivers and streams to meander and change course over time.

Rural activities (e.g. farming, horticulture and forestry)

- Retain existing stock exclusion provisions, where they are more stringent than the national regulations, i.e. include sheep in the definition of stock and include rivers less than 1m wide (noting that the current AUP stock exclusion rules only apply to intensively grazed land so are generally less stringent than the national regulations); or build on the national regulations and require a buffer wider than 3m.
- Amend existing AUP provisions for rural production activities, such as setting limits to restrict the expansion or intensification of rural land uses, and introduce more restrictive permitted activity standards for ancillary farm earthworks.
- Consider whether to introduce limits on nutrient discharge volume, on catchment nutrient loads, or on fertiliser application for horticulture.
- Identify alternatives to current nutrient practices such as high fertiliser application rates.
- Introduce more restrictive requirements than the national directions for forestry activities with a high-risk for sediment generation, e.g., increase the setbacks from waterbodies, require consents for works on highly erodible land and/or works that exceed a specified area threshold.
- Promote good farm management practices through Freshwater Farm Plans to address dissolved oxygen, dissolved reactive phosphorus, *E. coli*, sediment and to reduce faecal contamination in rural streams and supporting non-regulatory incentive schemes. Existing schemes include the Waterways Protection Fund, the Kaipara Moana Remediation, and industry group initiatives such as the Sustainable Dairying – Water Accord.
- In the Pukekohe Specified Vegetable Growing Area:
  - Set minimum riparian buffers between vegetable growing paddocks and waterways, nitrogen application limits, and a consenting requirement for changes from other land uses to vegetable production.
  - Use non-regulatory approaches to improve nutrient management, such as voluntary reporting of synthetic fertiliser use, and reporting and mapping sub-drainage systems in vegetable paddocks.

Wastewater and stormwater management (urban and rural)

- Strengthen the AUP provisions to be consistent with the performance standards in the council's updated guidance documents for on-site Wastewater and stormwater management (urban and rural).
- Require the provision of maintenance records for on-site wastewater systems, explore how to prevent rainwater egress, and potentially provide permitted activity pathways for upgrades to existing systems.
- Set limits on the discharge volume and instream concentrations of nutrient loads (for stormwater and wastewater) and *E. coli*.
- Reduce wastewater overflows and discharges in urban areas, including through infrastructure maintenance and renewals and investigate cross connections which result in wastewater entering the stormwater network and vice versa. This includes the programmes funded by the Water Quality Targeted Rate, including the Safe Septics and Safe Networks programmes and Watercare's network and wastewater treatment plant upgrade programmes.

- Improve monitoring and modelling (Safeswim) of health risks and freshwater quality at our primary contact sites to improve understanding of how land use or discharge management may need to be amended to protect recreational values.
- Reconsider the approach to managing impervious surfaces and stormwater mitigation to reduce in-stream erosion and provide for stream remediation or enhancement works.



Awaawaroa, Waiheke ▲

Land disturbance/ earthworks activities (urban and rural)

- Reconsider the approach to sediment-generating activities, to prefer approaches that minimise land disturbance and have a greater soil conservation focus.
- Use a percentage load reduction approach to inform our limit setting decisions for sediment in rivers, and introduce discharge standards.
- Require consents for land disturbance activities on land that poses a high risk of sediment loss, such as on highly erodible land.
- Require greater riparian setbacks and additional erosion and sediment controls where there is deemed a risk to waterbodies.
- Expand the role of Adaptive Management Plans in resource consenting for undertaking land disturbance activities, supported by improved collection and use of monitoring data, and enforcement.
- Review consenting thresholds (area, volume and setbacks) and matters to be considered for land disturbance in the Sediment Control Protection Area (an area defined in AUP for earthworks close to waterways) and relevant overlay areas.
- Require land disturbance on 'small sites' to be regulated and managed with sediment controls that are the same as for large-scale developments.
- Review the best practice guidance for land disturbance to ensure any industry advances and climate change scenarios are reflected and that, as appropriate, compliance with the guidance is required through the regulatory provisions.

Freshwater Farm Plans

Freshwater farm plans are a practical way for farmers and growers to demonstrate how they are managing the impact of their operations on the freshwater environment. They will be gradually phased in across Tāmaki Makaurau from late 2024 and will be a key method for implementing the NPS-FM, along with rules in the Auckland Unitary Plan and non-regulatory action plans.

Many farmers already have a farm environment plan or are part of an industry programme. Freshwater farm plans will build on that work.

Freshwater farm plans will need to include an on-farm freshwater risk assessment and an action plan which indicates the actions to be undertaken to manage risks that have been identified. Each farm's assessment will be different, depending on the farm landscape, the activities underway, and the characteristics of the local catchment.

Auckland Council will be providing information on catchment context, challenges, and values (CCCV) across the three freshwater management units (FMUs) and at part-FMU level where possible. CCCV helps farmers and growers adjust their farm plans to their catchment context and to understand the priority freshwater issues for their catchment.

Freshwater farm plans will be certified and audited, and the results will be reported to Auckland Council.

Effective implementation of freshwater farm plans will mean that farm management will address relevant freshwater issues and meet any requirements set out in national regulations or in the AUP.

The AUP plan change could include specific links to farm plans. For example, the AUP could:

- Specify additional information requirements relating to what information is supplied through the freshwater farm plan process, such as a requirement that all plans for dairy farms include a nutrient budget, or that data is supplied in a digital format, or includes a map of instream structures that are barriers to fish passage.
- Include additional regulatory requirements through rules in the AUP where the freshwater farm plan is used as a tool for demonstrating compliance. If the AUP included a new rule requiring that dairy effluent is discharged to land a set distance from waterways, the farm plan would then have to include actions to address this additional regulatory requirement.
- Create alternative permitted activity pathways for an activity where a freshwater farm plan is in place.

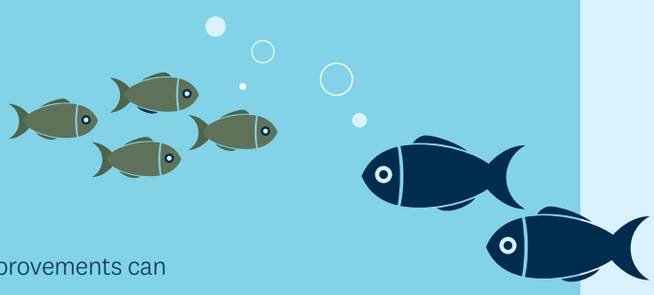
Rivers and streams

The NPS-FM sets a clear direction to avoid the loss of river extent and values to the extent that is practical. Approaches under consideration include:

- Maintaining the AUP non-complying activity status for river reclamation, which is more stringent than the requirements of the NES-Freshwater.
- Improving the clarity of existing standards and strengthening standards to better protect stream beds (particularly relating to culverts) while still supporting activities that need to take place.
- Removing regulatory barriers to stream restoration and considering whether stream restoration could be required by some standards.
- Aligning AUP definitions with national definitions, to reduce confusion.
- Promoting community stream restoration programmes, good management practices, and incentive schemes aimed at restoring river/streambed restoration.
- Actions in the Fish Passage Action Plan, such as incorporating fish barrier remediation into infrastructure renewals and upgrades, incentives, training and advocacy for removal of fish barriers on private land.

Fish passage action plan

A fish passage action plan is being prepared to ensure that in-stream structures enable the passage of fish.



New culverts must meet national standards. The challenge is with the more than 4,000 existing barriers to fish passage, most of which sit on private land. Improving fish passage is different for each site, depending on the features of the waterway (slope, flow) and the fish that are present. Improvements can be expensive, and maintenance is also an issue.

A prioritisation framework is in place for stormwater assets focusing on remediation in urban catchments. A regionwide framework is now being developed, focused on ecological benefits and remediation of barriers in clusters, primarily through a catchment focused-approach. This provisional framework is looking to identify high priority catchments based on a range of factors, such as mana whenua engagement and initiatives, high-quality habitat catchments, threatened species, cost-benefit, presence of community groups who can contribute and connectivity to the wider catchment.

Lake management

A lake-specific management approach is required (both for action plans and setting any plan limits or rules). This is so we can respond to the characteristics of different lakes, such as size, depth, use, catchment activities, water quality and presence of pest fish. Possible approaches include:

- Introducing AUP provisions for contaminant load management, nutrient management and hydrology management.
- Amending the AUP rule that prohibits the use of power-driven vessels on Lake Tomorātā and Lake Spectacle from 1 September to 19 December (bird breeding season) to support lake management (pest fish removal)
- Non-regulatory initiatives to remove pest fish and invasive plant species, which are already underway in some lakes.

Extent and value of natural inland wetlands

The NPS-FM sets requirements to avoid the loss of wetland extent and values, and for wetland restoration to be promoted. Approaches under consideration include:

- Integrating relevant national natural inland wetland regulations (NES-F) into the AUP to simplify the regulatory framework.
- Maintaining or increasing the stringency of requirements beyond the NES-F where appropriate (e.g., retaining the 20m AUP vegetation removal setback and including a wider definition of stock).
- Adding additional natural inland wetlands to the Wetland Management Area Overlay schedule.
- Including specific restoration requirements within structure planning.
- Integrating the wetland management provisions with the existing AUP subdivision provisions that provide for transfer of titles to the Rural-Countryside Living Zone, through the protection and enhancement of wetlands.
- Removing regulatory barriers for the restoration of natural inland wetlands.
- Providing greater direction about the NES-F gateway tests for those activities with exemptions. This may include new policy outlining the thresholds, information requirements and expectations for applicants to demonstrate alignment with the NES-F requirements.
- Non-regulatory methods will play a significant role in delivering the NPS-FM requirements for wetland protection and include the promotion and support of community wetland restoration programmes.

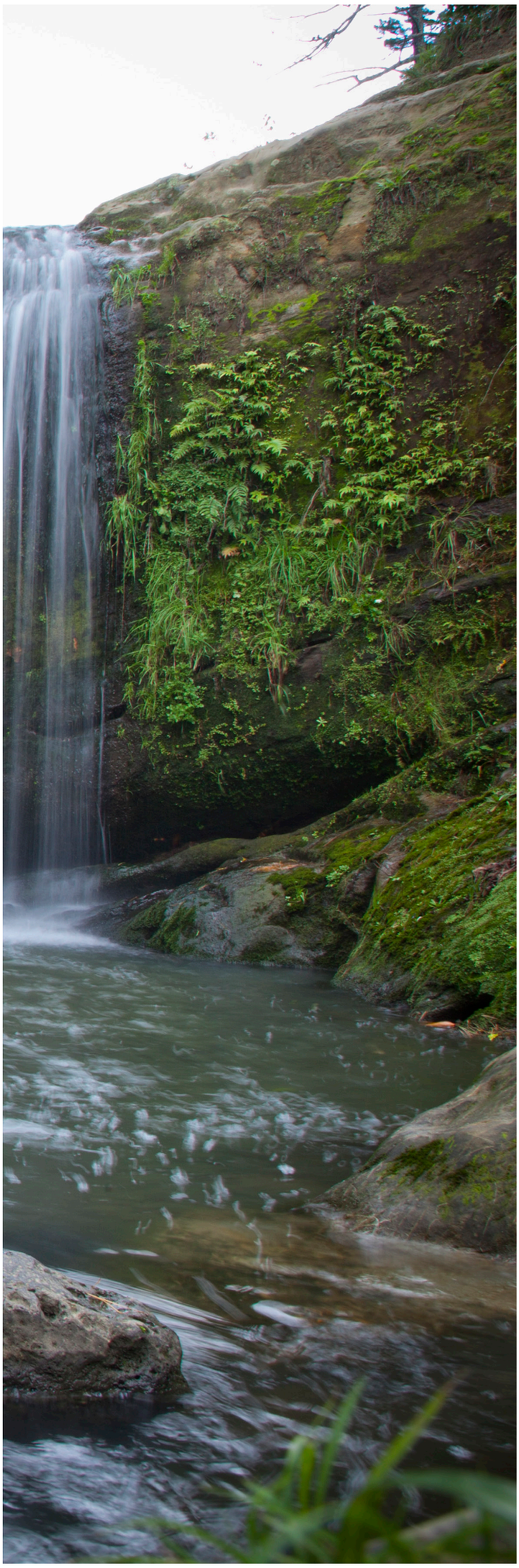


▲ Examples of barriers to fish passage



▲ Examples of fish passage structures and removal of barriers


Danger



Part five: managing water quantity

◀ Oakley Creek waterfall

19. Water quantity

The amount of water we take from rivers, streams, lakes and aquifers affects how much water is available for the aquatic life that also relies on freshwater for survival. Adhering to Te Mana o te Wai, our first priority is the health and well-being of water bodies and freshwater ecosystems.

The second priority of Te Mana o te Wai is the health needs of people. We need to ensure that people have sufficient, reliable and safe water for drinking and reasonable domestic use.

Once these needs are met, we can allocate water to reliably meet other needs such as reasonable irrigation, pastoral farming, food processing, commercial and industrial needs (aligned to the third priority of Te Mana o te Wai).

Climate change will affect water quantity. We can expect drier days, and more frequent and longer-lasting droughts. These conditions drive higher water demand, for both ecosystem health and for other uses.

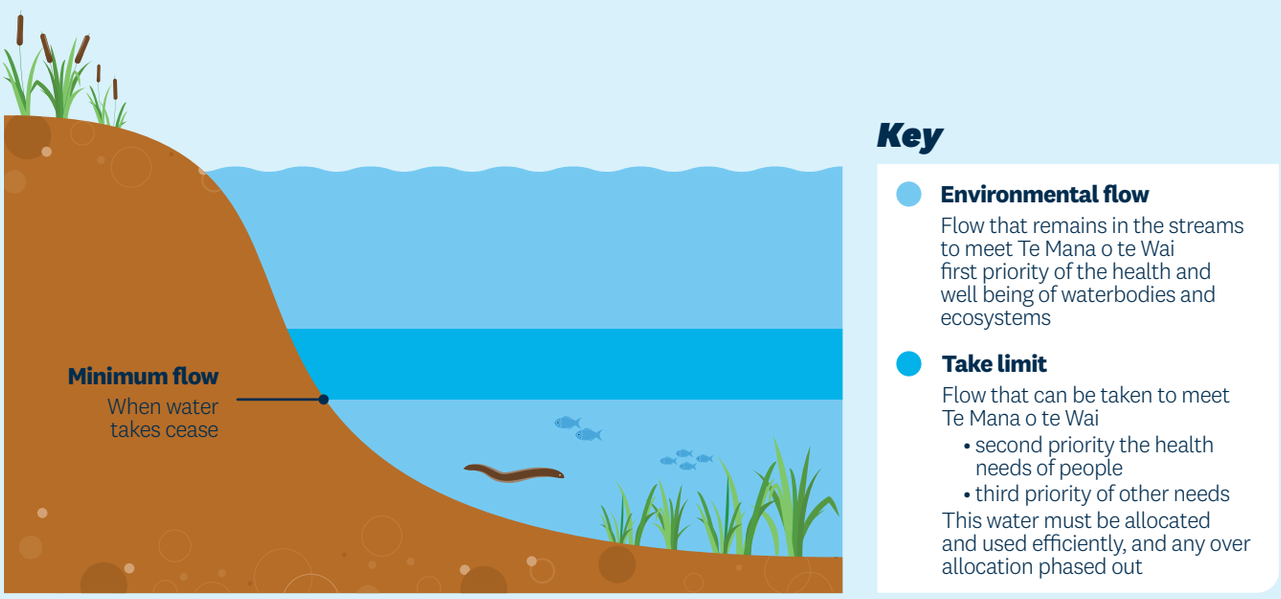
19.1. Reviewing flows, levels and take limits

Following Te Mana o te Wai, we must prioritise the health of the river, stream, or aquifer and the ecosystems that they support. We achieve this by setting flows and levels that provide for our instream values. Flows and levels describe the amount of water in, or moving through, a waterbody.

Flows and levels are already set in the Auckland Unitary Plan for parts of Tāmaki Makaurau that were previously identified as having the highest demand for water. The flows and levels are being reviewed in preparation for the NPS-FM plan change in 2024.

As part of the plan change process, Auckland Council needs to decide how conservative to be in setting flows and levels, i.e., how much weight to put on providing for the first priority of ecosystem health. The approach adopted may be different for different water bodies.

▼ **Figure 15: Surface water management**



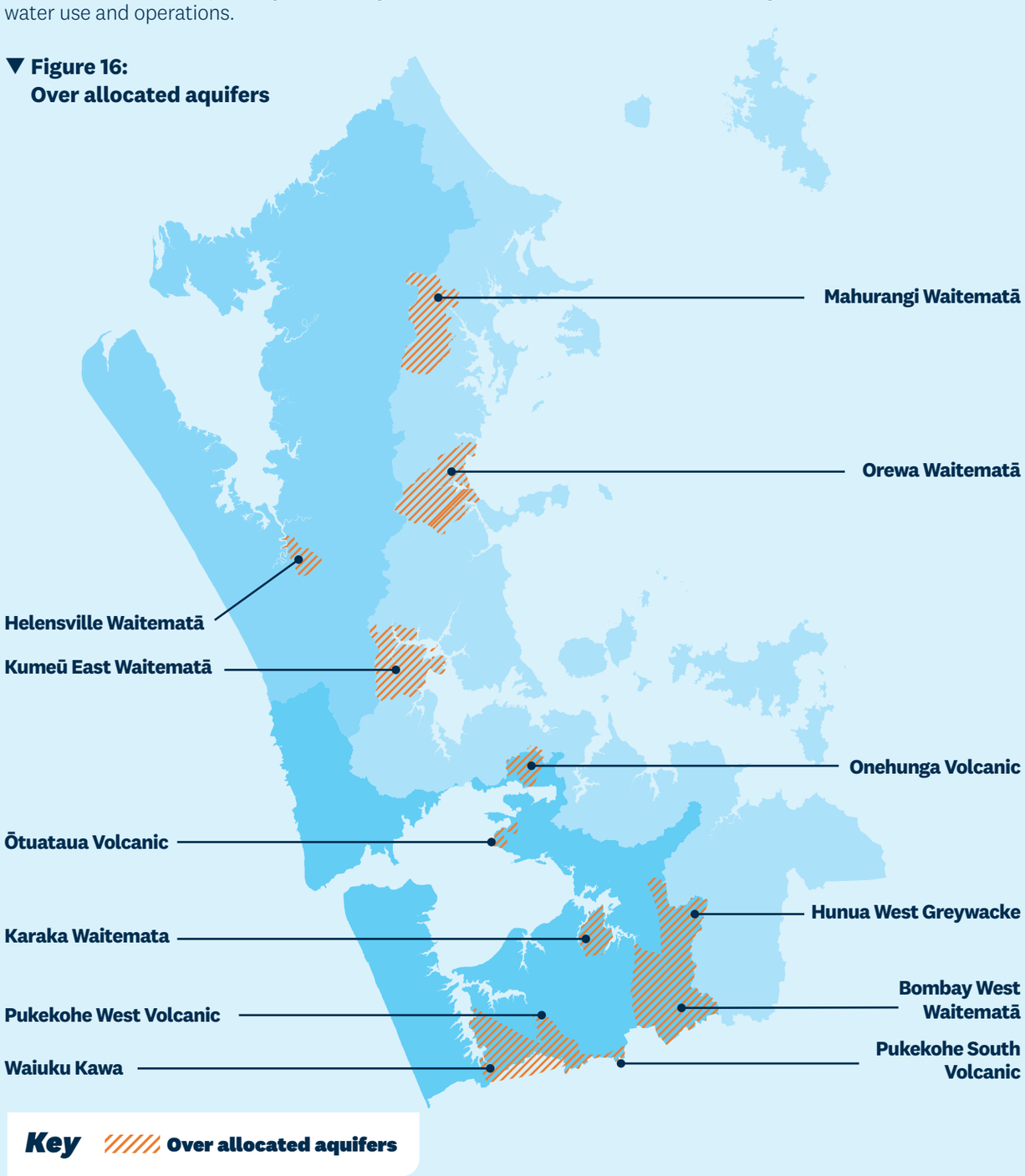
19.2. Revising take limits

We must also set **take limits** in the AUP - a take limit is the volume of water that can be taken from a waterbody, while ensuring that the set flows and levels are maintained. Some waterbodies already have take limits in place. Where no specific AUP limit is set for a waterbody, applications for water permits must demonstrate that the proposed take will be sustainable. Through the NPS-FM plan change process, we expect that take limits may be revised to be the same or lower than the existing ones.

Revised flows, levels and take limits may mean that less water is available for allocation, and existing water permit allocations may need to be reviewed.

When stream flows or lake, wetland and groundwater levels fall to specified levels, water users will need to reduce their abstraction or stop taking water altogether. For some water users this will be a significant risk to their current water use and operations.

▼ **Figure 16:**
Over allocated aquifers



19.3. Current state of water allocation

Auckland Council needs to improve water quantity data management. We have a centralised accounting approach for information relating to groundwater and are in the process of developing a similar approach for surface water.

Our best available information suggests around 10 per cent of our aquifers are currently over allocated (see image on previous page). We do not anticipate significant or widespread over-allocation of surface water compared to the current AUP limits.

19.4. Allocation and phasing out over-allocation

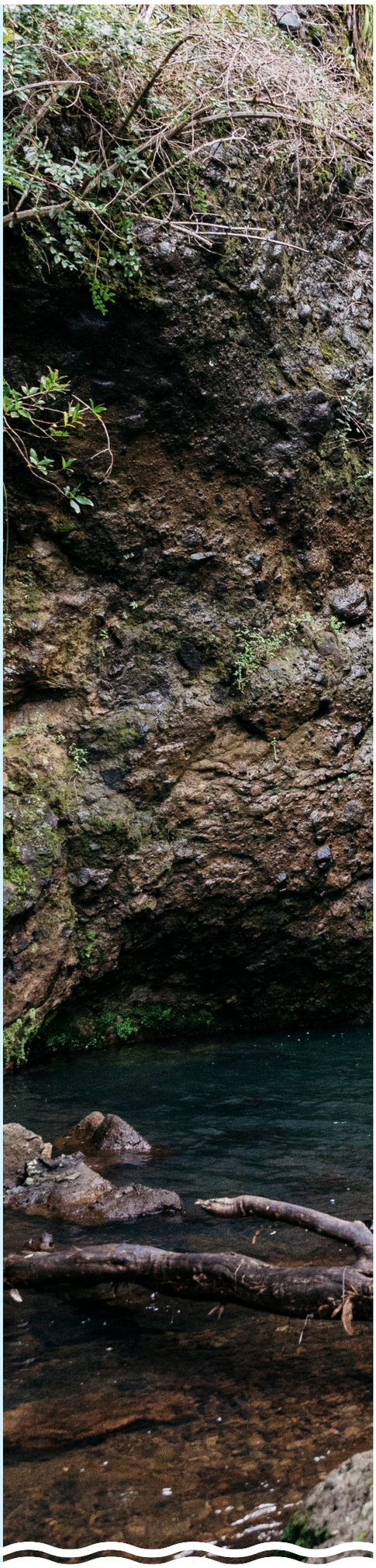
The NPS-FM requires us improve and maximise efficient allocation and use of water. Auckland Council is also required to phase out any over allocation (we know that there are some over-allocations already occurring). The revised AUP flows, levels and take limits may mean that more waterbodies are deemed to be fully allocated, or over-allocated. In situations of over-allocation, the council will need to determine how to reduce the existing water allocation to water permit holders from the same waterbody. It could be that:

- Allocations are reduced across all water users, except users that prioritise the health needs of people, such as drinking water
- Some water uses are prioritised above others. Currently, we prioritise domestic needs, municipal water supply, and animal drinking water. We could be more specific, for example, the plan could prioritise water allocation and use for agriculture or horticulture over other users, in areas where Auckland has highly productive land.

Work is underway to develop an approach for phasing out over-allocation, and to determine the timeframe in which it will take place. The notified plan change will include further information about how and when this will take place.



▲ Hoteo River water level gauging site



▶ Karamatura Track, Huia







Part six: next steps

◀ Waitangi Falls

Kōrero mai

Have your say

We are looking forward to receiving your feedback on the proposed approach that we have outlined in this document. The consultation is open from 3 November to 4 December.

Have your say by 4 December 2023. More information, including the feedback form and upcoming events can be found at **akhaveyoursay.nz**

We will collate and analyse the feedback, to report to mana whenua, Local Boards and the council's Planning, Environment and Parks Committee early next year. The feedback will be used to finalise the proposed changes to the Auckland Unitary Plan.

We need to notify a plan change to the AUP by the end of 2024. There will be further opportunity for public submissions as we move through this process.

There are a number of ways you can share your views on how to put freshwater first.

Written and online feedback

You can download a feedback form or provide feedback

- online at **akhaveyoursay.aucklandcouncil.govt.nz/freshwaterakl**
- on request at Auckland Council libraries

Face-to-face

A range of face-to-face events and drop-in sessions will be held across the region. Find out about these on **akhaveyoursay.aucklandcouncil.govt.nz/freshwaterakl**.

Phone feedback

If you would prefer to give your feedback over the phone you can register for this by phoning 09 301 0101.

Online information sessions

We are holding an online information session on Wednesday, 15 November 2023, from 5:30pm - 7:30pm, presented by Auckland Council staff.

You will have an opportunity to listen and ask questions.

This session will also be recorded and made available to view after the live event. To register, go to: akhaveyoursay.aucklandcouncil.govt.nz/freshwaterakl.

Translations

We want as many people from Auckland's communities as possible to have their say.

Translated copies of the feedback form are available in Te Reo Māori, Korean, Hindi, traditional and simplified Chinese, Samoan, and Tongan.

There is a New Zealand Sign Language video as well as accessible versions.

These can be found:

- at **akhaveyoursay.aucklandcouncil.govt.nz/freshwaterakl**
- on request at Auckland Council libraries

Where to find more information:

You can find everything you need to know at **akhaveyoursay.aucklandcouncil.govt.nz/freshwaterakl** including:

- a range of supporting information including this discussion document
- an online feedback form
- a printable feedback form (to email or freepost)
- a schedule for Have Your Say events.

Copies of the discussion document and feedback forms are available at council libraries.

Feedback received will be processed and a report made to decision makers. All personal details provided by you will remain private.

A summary of feedback related to the consultation will be publicly available in early 2024.

Glossary/ List of Abbreviations

Attributes
Attributes are the characteristics of water that we need to manage to look after our freshwater values.

AUP
Auckland Unitary Plan.

Awa
River or stream.

Aquifer
A permeable water-bearing rock, sand, gravel or other geological formation which is capable of receiving or storing water, and/or transmitting and yielding water at a sufficient rate to be a practical water supply.

Baseline state
A series of measures (known as 'attributes') that set a benchmark in time, describing what it was like in our rivers and lakes in 2017. The baseline state will help us to establish targets and evaluate progress over time.

Cyanobacteria
Cyanobacteria are naturally occurring blue-green algae that can produce toxins hazardous to human health.

E. coli
A bacteria present in human and animal excrement that can cause gastroenteritis.

Flows and levels
The amount of water in, or moving through, a waterbody.

Freshwater or fresh water
All water except coastal water and geothermal water.

Freshwater Management Unit (FMU)
All or any part of a water body or water bodies, and their related catchments, that a regional council determines under clause 3.8 [of the NPS-FM] is an appropriate unit for freshwater management and accounting purposes.



▲ Aotea Great Barrier

Kai
Food.

Kaitiakitanga
The obligations of tangata whenua to preserve, restore, enhance and sustainably use freshwater for the benefit of present and future generations. (A principle of Te Mana o te Wai).

Ki uta ki tai
The recognition and management of the interconnectedness of the whole environment, from the mountains, springs and lakes, down the rivers to hāpua (lagoons), groundwater, wahapū (estuaries) and to the sea. The local interpretation will vary according to tangata whenua views.

Macroinvertebrates
Small organisms such as insect larvae, snails, and worms which live on the beds of streams, and also adult mayflies, caddisflies and beetles. Macroinvertebrates are commonly used as indicators of the biological condition of waterbodies.

Mahinga kai
Generally refers to freshwater species that have traditionally been used as food, tools or other resources.

Mana
Authority / agency / power.

Manaakitanga
The process by which tangata whenua show respect, generosity, and care for freshwater and for others. (A principle of Te Mana o te Wai.)

Mana whakahaere
The power, authority, and obligations of tangata whenua to make decisions that maintain, protect, and sustain the health and well-being of, and their relationship with, freshwater. (A principle of Te Mana o te Wai.)

Mana whenua
Māori who have customary authority over land through ancestral links.

Mataawaka
Māori who live in Auckland and are not in a mana whenua group.

Mātauranga Māori
Māori knowledge, refers to all things physical, spiritual and emotional in a Māori context.

Mauri
Life force / vital essence.

Moana
Ocean / sea.

NES-F
National Environmental Standards for Freshwater.

NPS-FM
National Policy Statement for Freshwater Management 2020.

NOF
National Objectives Framework.

Primary contact site
A site identified by a regional council that it considers is regularly used, or would be regularly used but for existing freshwater quality, for recreational activities such as swimming, paddling, boating, or water sports, and particularly for activities where there is a high likelihood of water or water vapour being ingested or inhaled.

Puna
Spring.

Repo
Wetland.

Riparian
Relating to, or situated on, the banks of a river.

Roto
Lake.

RMA
Resource Management Act 1991.

SVGA
Specified vegetable growing area.

Specified rivers and lakes
a) rivers that are fourth order or greater, using the methods outlined in the River Environment Classification System, National Institute of Water and Atmospheric Research, Version 1 (*see* clause 1.8); and
b) lakes with a perimeter of 1.5km or more.

Take limit
The volume of water that can be taken from a waterbody, while ensuring that the set flows and levels are maintained.

Taonga
A treasured item, tangible or intangible.

Tauranga waka
Landing places where waka (canoes) are drawn up out of the water.

Te ao Maori
The Māori world.

Te Mana o te Wai
A concept that refers to the fundamental importance of water and recognises that protecting the health of freshwater protects the health and wellbeing of the wider environment. It protects the mauri of the wai. Te Mana o te Wai is about restoring and protecting the balance between the water, the wider environment, and the community.

Te Mauri o te Wai
Auckland's approach to Te Mana o te Wai: there can be no mana without mauri.

Tikanga
Practices / protocols / customs.

Wai whenua
Groundwater.



▶ Rangitopuni Creek, Riverhead



National Policy Statement for Freshwater Management Auckland consultation document, November 2023

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November 2023

ISBN 978-1-99-106091-4 (Print)
ISBN 978-1-99-106092-1 (PDF)

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Te Kaunihera o Tāmaki Makaurau