Ruamāhanga Whaitua Implementation Programme

Ruamāhanga Whaitua Committee, August 2018

Ruamāhanga Whaitua Committee

Artist acknowledgement

We acknowledge artist Jen Olson for use of her artwork *'Drift-Migrate-Navigate - Tuna tryptich'*.

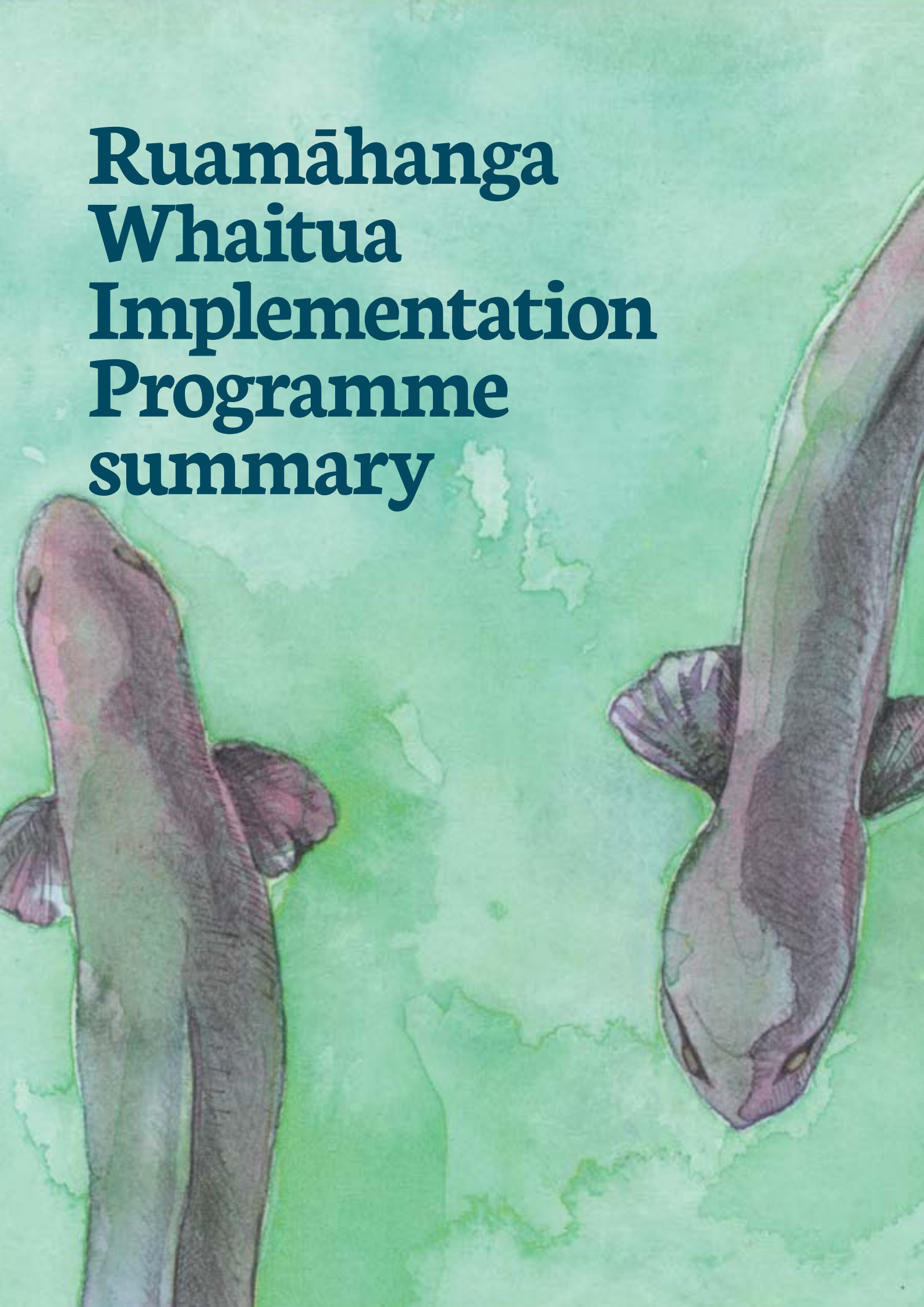
You can see her work here https://jenolson.weebly.com.

Ruamāhanga Whaitua Implementation Programme

Ruamāhanga Whaitua Committee, August 2018

Contents

Ruamāhanga Whaitua Implementation Programme summary



Ruamāhanga Whaitua Implementation Programme summary

The people of the Wairarapa Valley share a love and respect for the Ruamāhanga whaitua (catchment) and its landforms, tributaries, creeks and wetlands.

The Ruamāhanga Whaitua Committee (the Committee) is made up of elected members, mana whenua (Rangitāne ō Wairarapa and Ngāti Kahungunu ki Wairarapa) and community members drawn from throughout the Wairarapa Valley. This group of people was brought together to provide recommendations to Greater Wellington Regional Council (Greater Wellington) on the way forward for land and water management in their place.

In particular, the Committee was asked by Greater Wellington to make recommendations on how to implement the National Policy Statement for Freshwater Management (NPS-FM) in the Ruamāhanga whaitua.

This Whaitua Implementation Programme (WIP) is the result of the Committee's work and conversations and is a community response to a community need for change.

In preparing this WIP, the mission of the Committee has been to develop approaches to improving water quality that meet both the aspirations of the community and Greater Wellington's statutory obligations, while also being managed with increased fairness, efficiency and accountability.

The challenge

Improving water quality is not easy.

The overarching and complex issues that have caused and will continue to cause issues for the health of the whaitua are addressed in the WIP. We all need to be thinking of the catchment as a whole system in addressing these issues and exploring opportunities to reverse the damage done. Climate change, land use activities that affect water, river and lake management, and water allocation all present challenges when looked at in the context of improving water quality.

Solving these issues is not an easy or quick process and will require changes and effort across the catchment and community. Everyone will need to do their part, and sometimes that will mean new costs, new work programmes and behaviour changes.

Our approach

The Committee has spent the past four years discussing and communicating with groups in the community including iwi and hapū, business owners, farmers, scientists and ecologists – digging deeply into what they want and need for this catchment in order to look after water, and how changes could be implemented.

> **The Ruamāhanga whaitua process is the collaborative discussion on the future of our streams, rivers and lakes. The water that connects us. The land and our communities. Their historical nature and value to mana whenua.**
>
> Peter Gawith, Chair of the Ruamāhanga Whaitua Committee

Values-based decision-making

The Committee has worked with communities to identify the core Ruamāhanga values, and utilised these values as the primary guide for all decision-making. National legislation directs all communities to improve water quality. Continuing our current practices in urban and rural land management will not deliver the changes sought by this national direction or by our communities. New limits and management approaches in this WIP must do so.

The Committee's work has been driven by the way people value water in the Ruamāhanga whaitua. From discussions in country halls, marae and town centres across the valley, the Committee has distilled the essence of how the community values water and identified a vision for the future of the whaitua to be a place where water glistens, where:

- We are all connected to the water so we are all equally responsible for creating a more natural state
- Holistic land and water management creates resilience
- Recreational and cultural opportunities are enhanced
- There is a sustainable economic future
- Water quality is improving
- Ecological enhancement is sustainable
- Ko wai, mo wai, no wai: waterways connect communities; there is a sense of identity for people and water
- There is safety and security of (drinking) water supply

Reflecting mana whenua relationships

The identity and wellbeing of Wairarapa iwi, Rangitāne ō Wairarapa and Ngāti Kahungunu ki Wairarapa, are directly associated with Te Awa Tapu o Ruamāhanga (the sacred Ruamāhanga River) and its many tributaries. From the headwaters to the sea, local iwi and hapū identify with the river system as a source of mana and mauri. These traditional relationships of Māori with water are recognised in the Resource Management Act 1991 (RMA) and in the NPS-FM as matters of national significance. Recent Treaty of Waitangi settlements have also recognised the mana whenua role as kaitiaki in the future governance and management of Wairarapa Moana (Lake Wairarapa, including its wetland margins and connecting waterways) and Ruamāhanga.

The integration of the mana whenua perspective with catchment planning is critical to the work of the Committee, which has been working with local kaitiaki and marae communities to ensure that Māori values are recognised and provided for in the WIP.

The Committee's recommendations aim to ensure that active mana whenua leadership and participation is integral to the implementation of improved water quality and quantity in all places in the Ruamāhanga whaitua. The recommendations do this by requiring that hapū/marae have a structural role in freshwater management unit (FMU) implementation management processes and that their values are integral to reporting on progress at community catchment scale. The recommendations also require that hapū/marae capacity and capabilities to both lead and participate as mana whenua kaitiaki are supported and resourced through the development of a mana whenua-led kaitiaki support mechanism.

Our tasks

The Committee is part of a broader national push in land and freshwater management that also reaches individual communities such as hapū and marae. Under the national direction of the NPS-FM, regional councils are required to set goals with their communities to maintain and improve freshwater quality. These goals are based on the communities' values.

Part of the Committee's task is to identify the boundaries of FMUs for all water bodies and their catchments and then, within these FMUs, identify the desired environmental outcomes (also known as "freshwater objectives") and ways to achieve those objectives (described in integrated policy packages). Identifying FMUs enables communities to take ownership of and responsibility for looking after the water bodies in each sub-catchment. Each FMU has its own mana and identity. The Committee has identified 21 river FMUs and two lake FMUs (Figure 4) for looking after water quality in the Ruamāhanga whaitua.

The following sections summarise the Committee's freshwater objectives for each FMU, outline the ideas underpinning how we might reach a glistening future, and identify the key parts of the policy packages (rules, investments and further work) to get us there.

What we want to achieve

The Committee has identified a broad range of freshwater objectives for streams, rivers and lakes in order to provide for the way people value water in the Ruamāhanga whaitua (see Chapter 4).

These objectives can be broadly summarised as follows:

- Water quality for recreation needs to improve across the whaitua so that waterways are swimmable. This includes improving the state of *Escherichia coli* (*E. coli*) in all river FMUs so that at least a National Objectives Framework (NOF) state of C[1] is achieved by 2040
- Periphyton and macroinvertebrate health is improved in many streams and rivers, including to ensure that all water bodies meet the national bottom line for periphyton by 2040
- By 2050, sediment loads reaching waterways are substantially reduced in order to contribute to improving macroinvertebrate and indigenous fish health in streams and rivers and to improving ecosystem function and mahinga kai values in lakes
- The health of indigenous fish communities is improved in all water bodies, including to ensure that mahinga kai and cultural values are provided for
- The natural character of streams, rivers and lakes is restored, including to ensure there are healthy macroinvertebrate native fish and plant communities in these water bodies
- The health and resilience of Lake Wairarapa and Lake Ōnoke are improved, including to ensure all national bottom lines are met and the trophic level index state of both lakes is improved

Some of these objectives are expressed in words (see sections 4.2.1 to 4.2.3) while others are expressed in numeric form, including using the NOF of the NPS-FM to set objectives for the compulsory attributes of ecosystem health and human health for recreation (see sections 4.3 and 4.4 and Tables 8-12 in Appendix 3 for full summaries of these).

Our key themes

During the Committee's extensive work, a number of themes emerged that provide a strong foundation for the whole of the WIP direction and provide insights into the intent of the Committee's direction for land and water management in the whaitua over the next 10 years and beyond. These themes are:

- Ensuring integrated land and water management
- Ensuring effective implementation of the whole of the WIP
- Promoting innovation
- Seeking good management practice (GMP) across sectors and activities
- Improving the efficient use of water in an increasingly water-constrained environment
- Being equitable across the community
- Improving how we monitor, account for resource use and review progress

1 A state of C is considered suitable for primary contact. Primary contact means peoples contact with freshwater that involves immersion in water, and includes swimming.

How we're going to get there – three policy packages

1 Discharges and land use

The discharges and land use policy package is made up of the following key parts:

- Load limits and targets for nitrogen, phosphorus and sediment, and concentration limits and targets for *E. coli*, for each FMU. These will be set as rules in the Proposed Natural Resources Plan (PNRP). For the catchment they require a nitrate reduction of 9%, a phosphorus reduction of 34% and a sediment reduction of 28%
- Reduction targets for sediment loss from land uses, to be achieved by 2050:
  - Reduce stream-bank erosion in all FMUs
  - Significantly reduce hill-slope erosion in the "top five" FMUs producing the most sediment from non-native-land uses (the Taueru, Huangarua, Eastern hill streams, Whangaehu and Kopuaranga)
- Undertake sub-catchment, landscape-scale strategic planning with communities in each relevant FMU to identify how to best achieve the sediment reduction targets
- Manage diffuse-source discharges (e.g. farming activities) through a non-allocation regime. Manage these discharges in accordance with GMP, farm planning, regulation of land use change and the promotion and support of "catchment communities" as key mechanisms for meeting water quality limits and achieving freshwater objectives in each FMU
- Greater Wellington reviews the need for a nutrient allocation approach 10 years after the plan change resulting from this WIP
- Promote farm environment planning as a primary tool for managing activities at the farm scale
- Emphasise and promote riparian management as a key part of reducing the impacts of discharges on water quality
- Manage point source discharges (e.g. wastewater treatment plants) with discharge standards consistent within limits and the achievement of freshwater objectives
- Ensure that wastewater discharges are applied to land (in the main) by 2040
- Manage urban stormwater discharges in accordance with the consenting process in the PNRP

2 Rivers and lakes management

The rivers and lakes management policy package is made up of the following key parts:

- Take an integrated approach to slowing water down across the whaitua, including through promoting groundwater recharge
- Restore the health of Lake Wairarapa and Lake Ōnoke, with an emphasis on the trial and application of management methods in the lakes
- Investigate options for restoring the connection of the Ruamāhanga River to Lake Wairarapa, holding Lake Wairarapa at higher levels and having different opening regimes for Lake Ōnoke
- Promote the restoration and creation of wetlands
- Seek opportunities to enhance the natural character of rivers, including by aligning flood management processes, planning and investment with the Ruamāhanga whaitua freshwater objectives

3 Flows and water allocation

The flows and water allocation policy package is made up of the following key parts:

- Enable attenuation and storage at a range of scales
- Base the water quantity limits (minimum flows and allocation amounts) on those in the PNRP, with the following changes
    - Raise the minimum flows in the Upper/Middle Ruamāhanga River area (above the Waiōhine River) over 20 years, and in the Waipoua River over 10 years, to provide for the same level of fish habitat protection as for all other rivers in the whaitua
    - Cap allocation amounts from all water bodies at the current use
- After 10 years, require takers of Category A groundwater (groundwater directly connected to a surface water body) to fully cease takes of water at minimum flow
- Undertake further investigations to ensure that groundwater takes classified as Category A groundwater have a direct connection with a nearby river stream or lake
- Ensure the protection of small streams at low flow through more clearly setting minimum flows in the PNRP and undertaking investigations into streams under pressure from potential over-abstraction (including the Parkvale Stream, Booths Creek, Mākōura Stream, Kuripuni Stream, Huangarua River, Tauanui River and Tūranganui River)
- Reduce the amount able to be taken as a permitted activity (excluding takes for the health needs of people and for stock watering) from 20m3/day to 5m3/day
- Update all resource consents with relevant conditions to ensure that they are in line with policy settings
- Review conditions for resource consents to take water and apply water shortage directions to ensure that adverse effects are appropriately addressed

This document is a community response to a community need for change. The people of the Wairarapa Valley share a love and respect for Ruamāhanga; its landforms, tributaries, creeks and wetlands. Ruamāhanga the ancestor, Ruamāhanga the childhood playmate, Ruamāhanga that feeds the land and the people, Ruamāhanga that overwhelms with floods, Ruamāhanga the sewer. Ruamāhanga: a source of community pride and community sorrow.

1. Te Mana o Ruamāhanga – the significance of Ruamāhanga

Tuatahi ko te wai, tuarua whānau mai te tamaiti, ka puta ko te whenua.

Ko wai oranga, ko tangata oranga, ko whenua oranga.

When a child is born the water comes first, then the child, followed by the afterbirth.

The living water, the living people, the living land.

1 Te Mana o Ruamāhanga – the significance of Ruamāhanga

The challenge of improving our water bodies in the Ruamāhanga catchment must not be underestimated. We must change or we will not be able to support our lives and those of our future generations. This change requires determined effort and commitment from our whole catchment community, from Pūkaha to Palliser: town and country, industry, community groups, whānau and individuals to provide for the freshwater values required by government and Wairarapa people. Improvement relies on our taking more care and investing more in practices that will limit the effects of our activities on our water bodies. It requires us to have new ideas, great innovation, investment and the courage to change the way we do things.

We must commit to new learning and understanding that will inspire our communities to change their practices and look for opportunities to do them better. Improving water quality will take time and sustained effort over many generations to restore values and build resilience. The Ruamāhanga Whaitua Committee (the Committee) emphasises collaboration. We see that the drivers for change lie with the people of Wairarapa.

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1.1 Where water glistens – Ruamāhanga values and issues

In the past four years the Committee has heard expressions of pride and frustration from people in the Wairarapa community about the current and future state of their rivers, local water quality and quantity, the impacts of new regulations on their livelihoods, and the effects of climate change on their community.

Community values (see page 16) expressed to the Committee through discussions in country halls, marae and town centres have been brought together into a single vision-led document entitled “Where water glistens”. It tells the story of a Ruamāhanga future where:

- We are all connected to the water, so we are all equally responsible for creating a more natural state
- Holistic land and water management creates resilience
- Recreational and cultural opportunities are enhanced
- There is a sustainable economic future
- Water quality is improving
- Ecological enhancement is sustainable
- Ko wai, mo wai, no wai: waterways connect communities; there is a sense of identity for people and water
- There is safety and security of (drinking) water supply

Through extensive community engagement over four years, the Committee has heard that the Ruamāhanga catchment is degraded and does not meet the cultural, social, environmental and economic expectations and needs of the Wairarapa community. In particular:

- The natural state of rivers and lakes has been modified to the extent that low flows occur in our rivers that harm the ecology and natural habitat, affecting our ability to use rivers for recreation and cultural purposes
- Mana whenua values and interests are not well recognised in the current water management system
- The reliability of water supply for town supply, agriculture and industry is decreasing
- The current water allocation mechanism is not the most efficient or equitable method
- In some places, water quality fails to meet national objectives and community expectations for swimmability
- Water quality fails to meet the national bottom lines in Wairarapa Moana (Lake Wairarapa, including its wetland margins and connecting waterways) and Lake Ōnoke
- The effects of climate change are expected to become more pronounced, and this will exacerbate flood events, droughts, irrigation reliability and habitat loss

1.2 Who is Ruamāhanga?

The mana (pride and strength) of Ruamāhanga is carved across the lower North Island. Ruamāhanga has massive scale, great diversity and a generative force that enables and empowers all life in the Wairarapa Valley.

Ruamāhanga is the largest flowing body of water in the Wellington region. It extends from Pukematawai, a peak in the north-western Tararua Range, to Wairarapa Moana in south-eastern Wairarapa. This is a journey of more than 130 kilometres, taking in many thousands of hectares of land and a myriad of water bodies, large and small. Along the way the flow of Ruamāhanga is at times strengthened, as it receives water from many tributaries, and at others diminished, as water is given to the land, forming springs and streams that ultimately return to the main stem.

Te Awa Tapu o Ruamāhanga – the sanctity of Ruamāhanga

Ruamāhanga exists in a cultural and spiritual context described by Wairarapa iwi Rangitāne ō Wairarapa and Ngāti Kahungunu ki Wairarapa.

> **The breath of life (te hā o te ora) was placed within the Ruamāhanga River at the beginning of time. The hā is present in Papatūānuku the earth mother's blood or the water that flows in through her main vein the Ruamāhanga. If water can breathe, all other life breathes and therefore ira tangata/humans are sustained.**
>
> Ngā Taonga nui a Kiwa – Schedule B, Proposed Natural Resources Plan

In this statement Wairarapa iwi Rangitāne ō Wairarapa and Ngāti Kahungunu ki Wairarapa identify the sanctity of Ruamāhanga and how the health of the water is fundamental to human health and wellbeing.

Te Mana o Ruamāhanga – the authority and renown of Ruamāhanga

Wairarapa rangatira Whatahoro Jury likened the waters of Ruamāhanga to mother's milk nurturing the people of Wairarapa.

> **Ko Waiōhine ko Ruamāhanga ēnei e wairua tipu mai i Tararua maunga e oranga e te iwi.**
>
> **These are Waiōhine and Ruamāhanga.**
>
> **They are like mother's milk flowing out of the Tararua mountains for the prosperity of the people.**
>
> Na Whatahoro Jury 1841-1923

Te Mauri o Ruamāhanga – the life force of Ruamāhanga

The mauri (or life force) and mana of Ruamāhanga is a composite formed by the individual mauri of many places, species and water sources. From the west come the Waipoua, Waiōhine, Waingawa (Waiawangawanga) and Mangatarere rivers. They find their source in the steep catchments of the Tararua Range. They bring force and energy along with mountain rock and gravel as they join the main stem of Ruamāhanga along the Wairarapa Valley floor. Whangaehu, Kopuaranga and Taueru in the north and eastern hills bring soft sediments and a lazier flow. Farther south, Tauherenīkau, Huangarua, Tauanui and Tūranganui all make their own distinct contributions as they enter Wairarapa Moana and Lake Ōnoke.

Ngā puna waiora (sources of life-giving water) are the many springs, small streams and wetlands that feed the larger water courses. Away from the force and volume of the larger entities, these places are rich in their ability to house and feed the many and diverse life forms that inhabit Ruamāhanga. These smaller places are greatly esteemed by mana whenua for their mahinga kai values and ability to support Māori customary use, particularly around marae and papa kāinga. They are some of the places best known by rural landowners and townspeople – the places they swam at and fished as children, that they rely on for their water supply, and the places through which they note changes in land and water over time.

The mauri of the river is also made up of the many natural elements that give it form. These include the mineral and organic compounds of the land it traverses and the many people, plants, birds, insects, fish and other animals that inhabit Ruamāhanga.

1.3 Wairarapa Moana – ka ora te repo, whakaora te taonga wai

Restore the wetland and you will breathe life into a treasured inheritance.

Vision of Wairarapa Moana governance group

The mana of Wairarapa Moana is the mana of Wairarapa, the second largest freshwater body in the North Island and an internationally significant wetland. Wairarapa takes its name from Wairarapa Moana, "the glistening waters" named by Haunui a Nanaia some 800 years ago. The Wairarapa Moana persona, culture and history are fundamental to iwi identity and the story of Wairarapa settlement and development since that time.

The Treaty of Waitangi settlements recognised the significance of the mana whenua relationship with Wairarapa Moana, and iwi will have ownership of the lake bed returned to them along with a leading governance role in managing both the Wairarapa Moana and Ruamāhanga catchments.

It is of course the mauri element of the water itself that represents the ultimate state of the catchment and its management. Wairarapa Moana and Lake Ōnoke are the last stopping places for Ruamāhanga on the long journey from Tararua to Kawakawa (Palliser Bay). It is in these wetlands and shallow tidal estuaries that the accumulated effects of that journey are finally able to be seen.

The mauri of Wairarapa Moana has been repurposed, reduced and restrained through disconnection, discharge and drainage. Wairarapa Moana is polluted to the extent that the mauri of the lake is at the point of extinction. Formerly the place where the waters of Ruamāhanga joined a massive tidal estuary rich in every kind of indigenous fish, plant and bird life, Wairarapa Moana has been disconnected from the river and become an unrefreshed backwater, loaded with sediment and introduced fish, slowly stagnating to a eutrophic state.

The much smaller Lake Ōnoke now takes on the full load of the Ruamāhanga. It is the sump of Wairarapa; the small coastal estuary accepts everything that the Ruamāhanga catchment community – land, people and livestock – collectively releases into the river. Cleaned by daily tidal change, Wairarapa's run-off is pushed up and down the coast, affecting marine and intertidal values.

Despite this degradation, the mana of Wairarapa Moana is in the ascendant. Underpinned by recent Treaty settlements that have recognised the fundamental importance of Wairarapa Moana to Wairarapa iwi, the region and the nation, there is an increased determination to better understand, protect and restore the values of the area. This is happening through a new regulatory emphasis on stock exclusion around the lakes and reducing contamination throughout the catchment. The proposal to restore Ruamāhanga to Wairarapa Moana is an example of the innovation required to improve the water quality of both lakes.

1.4 A privilege, not a right

Water quality objectives must address the most challenging ecosystem impacts affecting Wairarapa's rivers and lakes. There is a need to reduce contaminant loads, including *Escherichia coli* (*E. coli*), sediment and nutrients as well as restore habitats. Some of these shifts will be very challenging and require investment in a long-term programme to change practices and introduce new interventions.

For example, the presence of human and animal effluent and associated pathogens in water bodies throughout the Ruamāhanga poses a risk to human health and does not support community and mana whenua aspirations. The reduction of *E. coli* in any water body will demand a number of interventions, including innovative changes to land use practice, upgrades of urban stormwater and wastewater systems, stock exclusion from water bodies and investment in whole-landscape riparian management.

In making these changes we must recognise that using land and water is a privilege, not a right. Through valuing water we can change the way in which our catchment performs. We must take ownership so that it becomes second nature for each and every person to think about, conserve, protect and cherish water. From turning off the tap when brushing our teeth to encouraging better land use practices, we need water to be front and centre of how we live.

We need to understand that the land, water, vegetation and people are all linked and form a complex whole. To improve our catchment we need to understand and consider the whole catchment and how all our individual actions, past, present and future, affect its operation.

We need to work collectively and as community catchments. It was clear during the whaitua process that very few people were thinking in catchment terms. The overarching feeling was that many people were looking after their own interests and arguing their own corners. The best outcomes for the catchment will almost certainly involve innovative and collaborative investigation and actions. The tools that are used to manage the environmental effects of land and water use are often developed by combining a pool of knowledge and encouraging innovation. Community catchments; people working together is the future for collaborative implementation.

Much has been done to date. However, making the improvements recommended in this document will require sustained efforts over generations and involve the development of innovative land uses, new science and technology and new resources.

1.5 A complex legacy – town and country

Ruamāhanga has become the servant of many masters. The rivers bring water to meet the increasing needs of communities, farms and industries. They also have to take water away in the form of wastewater and stormwater, flood flows and run-off. In addition, communities expect to retain their ability to fish, swim and have cultural interactions with Ruamāhanga throughout the catchment. Ruamāhanga has been reshaped and repurposed to meet these demands, creating new, sometimes unintended but ever-accumulating issues and complexity.

The state of our water is determined by the land that surrounds it. If land is poorly managed, human and animal effluent, sediment and nutrients will contaminate water, creating health risks, compromising ecological health and limiting use. It is difficult to improve water quality once contaminants are in the river or to increase flow once the water has been taken out.

Historical deforestation and subsequent land use throughout the catchment continue to have the most severe impacts on water quality, environmental health, cultural values and the natural character of Ruamāhanga.

Where forest cover has been lost, the speed of water in steep hill country drives damaging flood flows. As a result the river has been managed as a flood channel to protect people and property. The straightening, grooming and braiding of the Ruamāhanga reduces natural character, mahinga kai and ecosystem habitat and destroys cultural values. A lack of shade throughout the catchment increases water temperatures and promotes algal growths that impacts human health and limit contact recreation and cultural uses. The increased speed of water also limits the ability of landowners to manage stock effluent on land and the opportunity to reduce contamination of water in extensive areas.

Climate change is a challenging issue. In response to a warming and drying climate with less water, immediate action and innovation is required to maintain and secure the current levels of water use reliability, let alone deliver the water requirements required for the future. We need to review how we use water, monitor our water takes more closely and establish new limits for water use in both town and country to provide for the sustainable future of the communities who rely on Ruamāhanga for their health and wellbeing.

Climate change is also driving an increase in the frequency of high-intensity and severe weather events. These have the potential to affect our communities and environment significantly through flood flows and damage to vulnerable soils.

The issues are not confined to rural areas. Ageing pipes and higher stormwater flows off evergrowing areas of hard surfaces put additional pressure on wastewater and stormwater systems through increased volumes and cross-contamination. These result in both managed and unmanaged discharges of contaminants to surface water and risk the contamination of groundwater. There is increasing uncertainty and concern about the potential for both rural and urban contaminant sources to seriously affect public health through contamination of aquifers.

1.6 Doing nothing is not an option

These issues affect the whole Ruamāhanga catchment community. Addressing them will require a whole-catchment and whole-community effort over generations.

Taken together, the often competing expectations, roles and demands have gradually changed the physical shape, capacity and nature of Ruamāhanga. Increased pressure across the whole system, spanning river management, water takes and discharges that cause contamination, has degraded both the natural character of Ruamāhanga and the quantity and quality of water.

Much has been and is being done to address these issues. Three generations of hill-country landowners have worked in partnership with Greater Wellington Regional Council (Greater Wellington) to reduce sediment through intensive tree planting. Year by year, territorial authorities continue to upgrade wastewater and stormwater networks and reduce contamination of Ruamāhanga. Every winter, Wairarapa people of all ages plant tens of thousands of plants and trees. In addition to work carried out and funded by individual landowners, planting is also supported by a range of non-government, councils and central government agencies.

Public and private partnerships have been, and are likely to continue to be formed to protect biodiversity and restore our environment, and to create additional protection through covenants and collaborative work programmes.

Farmers are continually endeavouring to improve practice and reduce the effects of their activities through innovation and refinement of land use, supported by their industries and research bodies. Mana whenua are sharing their understanding and knowledge of land, water, people and place and looking for a stronger role as kaitiaki in managing the restoration of their tūrangawaewae (traditional homeland). For innovation to flourish we need to understand, accept and embrace risk. Currently we do not facilitate innovation because we do not accept the risk of failure in trying something new.

In some places we have made real progress, improving water quality, reducing the effects of activities and making a difference. However, while we must acknowledge and value our endeavours and our achievements, we must also accept that our past efforts have not been enough to secure our future: the health of our waterways.

Doing nothing is not an option; our environment and economy are in danger of declining and we must find alternative ways of managing our catchment to ensure that future generations inherit a vibrant catchment, environment and lifestyle.

Our community agrees that change is required. They agree that we need a new approach to river management that reduces contamination, increases flow and restores the natural character of the rivers. They want more certainty of ecological health, certainty of water use reliability, and certainty that can support the wellbeing and development of the social, cultural, economic and environmental health of the Wairarapa community.

This document sets out the new approach towards “catchment thinking” and increased resilience, and identifies the direction and degree of change and the new mechanisms, objectives, limits, targets, methods and timeframes required to achieve that change.

2. Introduction

2 Introduction

The Ruamāhanga Whaitua Implementation Programme (WIP) is a non-statutory report that provides locally developed advice and direction to Greater Wellington on how best to manage land and water in the Ruamāhanga whaitua (catchment).

The authors of this WIP are local people – women and men, mana whenua, farmers, townspeople and councillors who have come together to learn about Ruamāhanga and develop approaches to water management and a new economy that meet both the aspirations of the community and our statutory obligations. How this will be achieved is critical, and this document describes a way that the Ruamāhanga whaitua can be managed with increased fairness, efficiency and accountability.

2.1 Who are the Ruamāhanga Whaitua Committee and what do they do?

The Committee is an advisory body established by Greater Wellington.

Ruamāhanga Whaitua Committee members

Aidan Bichan
Andy Duncan
Cr Chris Laidlaw (Wellington Regional Council)
Cr Colin Olds (South Wairarapa District Council)
Cr Michael Ashby (Carterton District Council)
David Holmes (Masterton District Council)
Esther Dijkstra (Deputy Chair)
Michael Birch
Peter Gawith (Chair)
Philip Palmer
Rawiri Smith (Ngāti Kahungunu ki Wairarapa)
Rebecca Fox
Russell Kawana (Rangitāne ō Wairarapa)
Vanessa Tipoki

The Committee is made up of elected and community-appointed members drawn from throughout Wairarapa and includes mana whenua representatives from Wairarapa's two iwi. As a group they are responsible for developing a WIP that will outline regulatory and non-regulatory proposals for integrated land and water management within the Ruamāhanga whaitua boundary, including measures to implement the National Policy statement for Freshwater Management (NPS-FM).

The establishment of the Ruamāhanga Whaitua Committee was seen by Greater Wellington as an opportunity to do things differently through a devolved, community-led planning process. Greater Wellington is particularly concerned to ensure that regulation for improving water is as far as possible driven by local leadership, knowledge and priorities in order to achieve the most pragmatic balance between giving effect to the NPS-FM whilst maintaining the economic viability and community support needed to deliver improved water quality and sufficient water quantity.

The recommendations in this WIP will be implemented by Greater Wellington working alongside mana whenua, communities and partner organisations. Some recommendations will become part of a plan change to the Ruamāhanga whaitua chapter of the Proposed Natural Resources Plan (PNRP), driving the way sub-catchment scale targets are achieved and resource consents issued. Other recommendations will be implemented through changes to strategic and operational planning undertaken by Greater Wellington, affecting the way resources are allotted in the future. Other recommendations set out the challenges and opportunities for the people of the Ruamāhanga whaitua and other organisations in helping to achieve this WIP's vision of glistening waters.

This document provides recommendations in the following chapters:

Whaitua implementation and Māori

Rangitāne ō Wairarapa and Ngāti Kahungunu ki Wairarapa hapū (families associated with a particular area and marae) and marae are mana whenua kaitiaki of Ruamāhanga. They maintain the traditional relationships with Ruamāhanga over time, including aspirations for the restoration of the mauri or life force of the whole system.

The Committee's recommendations support the leadership and participation of hapū/marae of Ruamāhanga as being central to the achievement of freshwater objectives at all scales, particularly "freshwater management units" (FMUs). Their recommendations specify that Greater Wellington must actively support the capacity and capabilities of hapū/marae to have a leading role in whaitua implementation through the development of mechanisms and supporting resources.

Freshwater objectives for the Ruamāhanga whaitua

An FMU is an area that identifies and spatially delineates water bodies and the surrounding land that drains to those water bodies.

The Ruamāhanga whaitua has been divided into 21 river FMUs and two lake FMUs. Each of the FMUs is described in this chapter, together with their objectives.

Overarching themes

A number of key themes cut across the three integrated policy packages that have been developed to achieve our freshwater objectives for streams, lakes and rivers. The themes, which provide an overall context and direction for the WIP, are:

- Ensuring integrated land and water management
- Ensuring effective implementation of the whole of the WIP
- Promoting innovation
- Seeking good management practice (GMP) across sectors and activities
- Improving the efficient use of water in an increasingly water-constrained environment
- Being equitable across the community
- Improving how we monitor, account for resource use and review progress

Managing rivers and lakes in the Ruamāhanga whaitua

The physical habitat of rivers, streams, lakes and their margins is vitally important to determining the way ecosystems function and how the relationships between people and water bodies flourish. The "Managing rivers and lakes in the Ruamāhanga whaitua" chapter outlines the changes to high-level policy, investment and implementation methods needed to deliver on the objectives and the integrated water management story of the WIP.

Managing contaminants in the Ruamāhanga whaitua – discharges and land uses

The way we use our land and what we do on the land affects the quality of water in our rivers and streams. The "Mangaing contaminants in the Ruamāhanga whaitua- discharges and land uses" chapter outlines the recommendations for limits and methods to achieve the water quality objectives.

Flows and water allocation in the Ruamāhanga whaitua

We value our fresh water in many ways, whether it is for the water's life-supporting capacity or recreational values, or the economic value that water brings to the region. How we manage and use fresh water to provide for the range of values is a challenge. The "Flows and water allocation in the Ruamāhanga whaitua" chapter outlines recommendations for the policies, rules and methods used to deliver the objectives associated with the take and use of water.

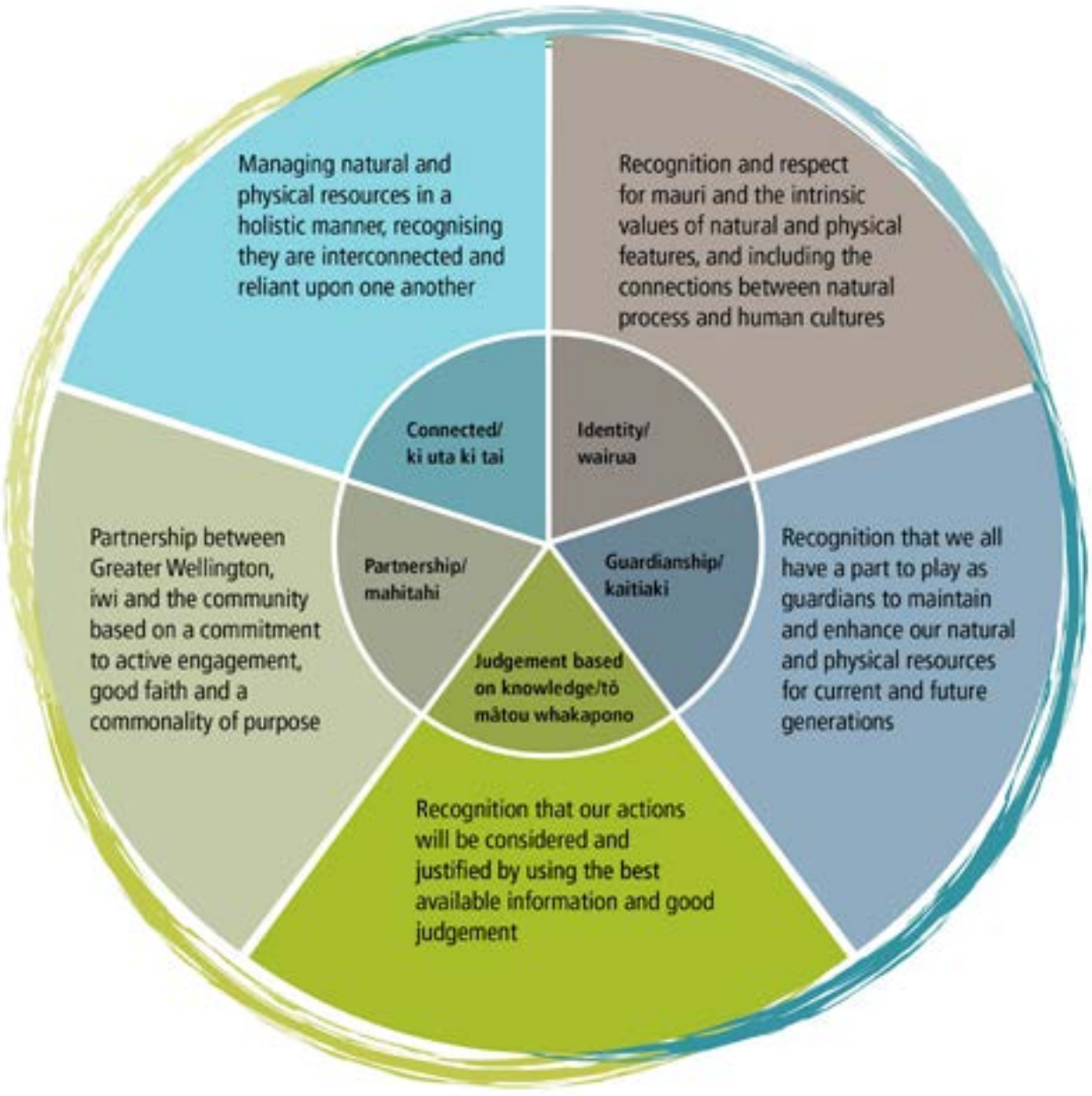
2.2 The decision-making process

2.2.1 Partnerships

The Ruamāhanga Whaitua Committee has operated in partnership with mana whenua, and our recommendations were guided by the five following principles (see Figure 1):

- Ki uta ki tai – interconnectedness
- Wairua – identity
- Kaitiaki – guardianship
- Tō mātou whakapono – judgement based on knowledge
- Mahitahi – partnership

Figure 1. Five guiding principles developed by Te Upoko Taiao



The identity and wellbeing of Wairarapa's two iwi, Rangitāne ō Wairarapa and Ngāti Kahungunu ki Wairarapa, are directly associated with Te Awa Tapu o Ruamāhanga (the sacred Ruamāhanga River) and its many tributaries. From the headwaters to the sea, local iwi and hapū identify with the river system as a source of mana and mauri. Iwi have a traditional relationship with the catchment that is being limited by changes in water quality and quantity. In addition to the direct effects of changing water quality on community health and economic and social wellbeing that they share with the whole catchment, local Māori point to a decline in mahinga kai (traditional food sources) and their ability to interact with water for cultural and spiritual purposes.

These traditional relationships of Māori with water are recognised in the Resource Management Act 1991 (RMA) and NPS-FM as matters of national importance. More recently, Wairarapa's Treaty of Waitangi settlements have given local recognition of the iwi relationship with the catchment through the establishment of an ongoing role for iwi in the governance of Wairarapa Moana and Ruamāhanga. Integrating the mana whenua perspective in catchment planning is critical to the work of the Committee, which has been working with local kaitiaki and marae communities to ensure that Māori values and interests are reflected in the WIP.

2.2.2 Legislation, principles, values and voices

The whaitua concept was born out of the need to make land and water management decisions that reflect the issues, physical setting and community of a place. One set of decisions for the whole region does not allow for this. Land and water management has traditionally been catchment based. The whaitua concept is a return to catchment-based decision-making. The Committee was formed partly in response to the government's new freshwater management regime for New Zealand, which is set out in the NPS-FM. It includes minimum standards for fresh water that regional councils must seek to achieve, so that the overall water quality in the whaitua is maintained or improved.

The Committee must give effect to both the NPS-FM and the New Zealand Coastal Policy Statement. The Committee is also guided by the PNRP. These require:

- The life-supporting capacity of freshwater ecosystems and the health of people and communities in fresh water to be safeguarded
- Iwi and hapū to be involved in freshwater decision-making, and the values and interests of tangata whenua to be reflected in freshwater planning
- Provision to be made for ecosystem health and mahinga kai, and for contact recreation and Māori customary use in rivers, streams, wetlands, estuaries and the open coast
- Objectives to be set that will maintain or improve freshwater quality. The NPS-FM contains a National Objectives Framework (NOF), which includes a set of optional values (things that the community wants water in their region to be used for, such as swimming, irrigation and economic or commercial development), as well as two mandatory "national values" (ecosystem health and human health for recreation)
- The NPS-FM sets a number of bottom-line key attributes for the mandatory values, and directs how councils are to go about setting objectives for the state of our water bodies and related limits on takes and discharges. There are biophysical attributes e.g. *E. coli*, periphyton and nitrate toxicity for all rivers and lakes. Other national values that must be considered include natural form and character, mahinga kai, fishing, irrigation, food production, animal drinking water, wāhi tapu, water supply, commercial and industrial use, hydro-electric power generation, transport and tauranga waka
- Over-allocation is avoided, and freshwater quality is improved where over-allocation has occurred
- Communities are enabled to provide for their economic well-being through the use of water, within limits

Ruamāhanga whaitua decision-making is informed by many voices. There is national legislation that directs regional plans. There are the voices of the many diverse local communities, whānau, businesses, hapū and individuals who have provided their views. There are groups with clearly vested interests; there are scientists from all disciplines; and there are those with cultural knowledge, local knowledge, political views and sector views. There are also those who do not have a voice or struggle to be heard but who must be considered – the treaty, social equity, te mana o te wai, the future of the catchment as a whole, the youth and unborn future generations, the mauri of individual water bodies, climate change and of course the views of the Committee itself.

The Committee's recommendations have been drawn from all voices. They have been informed by considerations that include and go well beyond a balance between environment and economy. The NPS-FM directs all communities and councils to maintain or improve water quality. The status quo has not and will not achieve this; new limits and management approaches must do so.

2.2.3 Ruamāhanga community values for water

The Committee's expression of how water is valued by the community of the Ruamāhanga whaitua is shown in Figure 2. These values have underpinned the Committee's decision-making and the recommendations of this WIP, not only in the context of setting freshwater objectives, as anticipated by the NPS-FM, but also across the policy packages designed to achieve the objectives. Within each freshwater management unit, the Committee also worked to further identify and provide for the way values may be held more strongly or have a greater presence in those subcatchments as part of the freshwater objective setting process (see Chapter 4).

2.2.4 Collaborative approach

The fundamental basis of this process has been the adoption of a collaborative approach to decision-making. This has provided an unprecedented opportunity for the people of the catchment to imagine goals and develop methods to achieve those goals, whether they are improved water quality or quantity, or the economic or cultural prosperity that comes with a balanced, sustainable and efficient functioning of the catchment. The community has been instrumental in identifying how land and water resources will be managed.

Figure 2. Ruamāhanga whaitua community values for water

Ruāmahanga Whaitua Community Values

We have a vision of the Ruamāhanga being 'where water glistens'.
This is how the Ruamāhanga community use, value and care for water.

Te Mana o Ruamāhanga – Mauri, Habitat, Biodiversity and Natural Character

The unique identity of our rivers, lakes and streams. Their flow, shape, form and colour.

- The life force of the water, the geology, plants, fish and animals.
- Natural character

This includes:

- Riparian systems
- Wetlands
- Groundwater
- Indigenous fish and in-stream habitat
- Water quality and quantity (flow, depth)
- Fish passage and spawning places
- Interdependencies between groundwater and surface water, wetlands, forests, attenuation and recharge
- Wairarapa Moana
- The Conservation Estate
- The coastal environment

Our Ruamāhanga River Culture

Our histories, our heritage, our whakapapa.

Our traditions, our social activities, our special places related to our waterways, then, now and in the future. Our social activities; camping, weddings, baptisms and barbeques. Our understanding and respect for people's connection to water bodies.

To tātou awa – we are shaped by the natural character of our waterways.

Assurance that our water is okay, what it looks like, sounds like, smells like, feels like to us.

Ruamāhanga Recreation

Recreation supports our community's health and wellbeing.

Currently, swimming, fishing, wading, boating and māhi parekareka ki te wai (enjoying yourself by the water) are important recreational activities in the Ruamāhanga whaitua (catchment). Recreational activities are supported by access to water bodies.

Ruamāhanga Economic Use, Resilience and Prosperity

He taonga te wai, water is life.

Water sustains our livelihood; water grows our people and communities.

Reliability of water supply supports our; incomes, employment and innovation, our farming, industry, tourism and commercial fishing.

Sustainable economic use of water brings resilience and prosperity.

In the Wairarapa:

- Our livelihood and wellbeing is tied to water quality and quantity
- The benefits of water are shared equitably amongst our community
- Our water storage can improve security of supply
- Our water isn't owned by anybody
- Our water is managed by everyone
- We value the efficient use of water
- Protection of assets through flood management

Ruamāhanga Community Public Health and Wellbeing

Hau ora tangata

Wai ora – Water for our health; spirit, mind and body Water for drinking

Protection of public safety through flood management

Safe management of stormwater and sewage.

Māori Use – Mahinga kai

Mai te pae maunga o Tararua tae noa ki Kawakawa moana (from the Tararua mountain range to Palliser Bay).

Mauri of our wai supports our people and our place.

Wairarapa, wairua, wai whakawātea, wai tohi, wai ora, wai tohu; glistening waters, spiritual waters, cleansing waters, baptismal waters, life giving waters, guiding waters.

Wai tuna, wai pātiki, kourarau: eel waters, flounder waters, abundant crayfish.

Ngā puna, ngā manga, ngā awa, ngā roto, ngā repo, taku taimoana.

2.2.5 Considering climate change

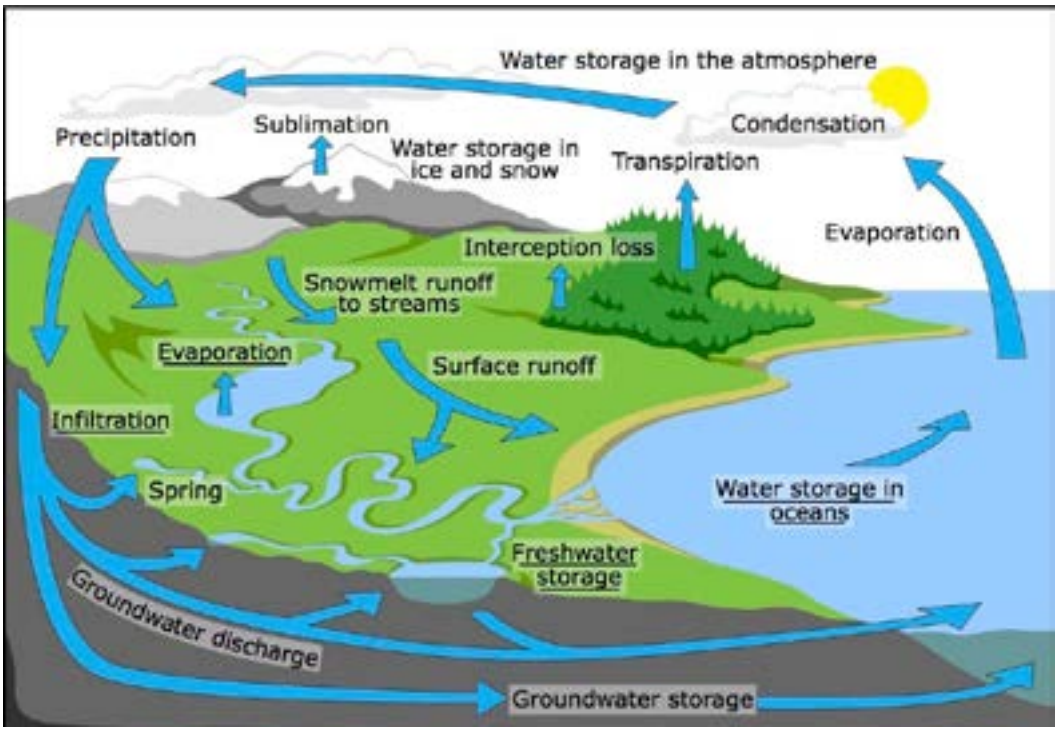
Climate change is the biggest environmental challenge we face. The effects of climate change have tough economic and social implications for communities, with increased risks to settlements, infrastructure and ecosystems from rising seas, storms and flooding. The latest climate change predictions indicate that Wairarapa will experience a significant increase in hot days, more droughts and a significant decrease in river flows by 2040, and more so by 2090. The Committee considered a climate change report produced by NIWA (the National Institute of Water and Atmospheric Research) in 2017 for the Wellington Region and a Ruamāhanga-specific report "Impact of climate change on inflows to the Ruamāhanga groundwater management zone".[2]

2.2.6 Building resilience

The hydrological cycle describes the continuous movement of water on, above and below the Earth's surface. It is a closed loop so only the processes shown in Figure 3 can change the amount of water available for use from our rivers, streams and groundwater. Some of the processes are changing through climate change (e.g. changes in precipitation patterns and increased evaporation) and these are likely to affect the whaitua and our ability to be resilient in land and water management into the future.

If we plan now, and explore mitigation and adaptation options, we may be able to increase our resilience to the impacts of climate change and the availability of water, particularly during dry months, so that we have water at the times when we most need it. This has informed the Committee's thinking in developing recommendations, particularly in seeking opportunities to enhance groundwater recharge, storage and wetlands.

Figure 3. The water cycle



2.2.7 What could this mean for me?

Implementation and compliance will require new costs, new work programmes and changes in practice that will inevitably affect some parts of the community more than others. It is anticipated that the new limits and management requirements proposed in this document will drive changes in land use, require additional funding from ratepayers and demand an "all in", whole-landscape, whole-community approach to achieving freshwater objectives.

2 http://www.gw.govt.nz/assets/Climate-change/Climate-Change-and-Variability-report-Wlgtn-Regn-High-Res-with-Appendix.pdf and http://www.gw.govt.nz/assets/FINAL-Impact-of-climate-change-on-inflows-to-the-Ruamahanga-groundwater-management-zone-February-2017.pdf

3. Whaitua implementation and Māori

3 Whaitua implementation and Māori

3.1 Context

While many aspects of the wider community's values are highlighted in the WIP, there is an important emphasis on Māori values, many of which are shared by the wider community.

Throughout the process of drafting the second generation of a regional plan (the PNRP), Greater Wellington has explicitly sought to include Māori. Ara Tahi is the committee that has brought iwi leadership in the Wellington Region to the table, to set direction for the PNRP with the region's political leadership.

Much of the overview of the specific and technical drafting of the PNRP came from Te Upoko Taiao (the Natural Resources Plan Committee). It was here that the principles of the Treaty of Waitangi were given space to consider how tangata whenua and tangata tiriti would be partners in protecting the whenua and wai and how each partner would participate, in roles ranging from governance to management and operation. One way the Treaty principles are made explicit is through the five principles (see section 2.2.1) that set the foundation for how we relate to the rights and responsibilities of local government in the Wellington Region.

3.2 Ruamāhanga Whaitua Committee and Te Mana o Te Wai

The five guiding principles are the base for the Ruamāhanga Whaitua Committee too. As the Committee drafted this report, and ultimately for the recommendations to go through a plan change process, it was required to consider legislation that applies to the drafting of regional plans. Some of these requirements apply directly to including Māori perspectives.

The Committee has taken these requirements into the WIP, including guidance from the NPS-FM, the RMA and the provisions in the PNRP. The NPS-FM guides the Committee to consider and recognise "Te Mana o Te Wai".

This specifically happens at the FMU scale. Each community will decide what Te Mana o te Wai means to them at an FMU scale, based on their unique relationship with fresh water in their area or rohe.[3] The Statement of National Significance in the NPS-FM describes the concept of Te Mana o te Wai as the integrated and holistic health and wellbeing of the water. It is up to communities and councils to consider and recognise Te Mana o te Wai in their regions.

Te Mana o te Wai is a concept for fresh water that encompasses several different aspects of the integrated and holistic health and wellbeing of a water body. When Te Mana o te Wai is given effect, the water body will sustain the full range of environmental, social, cultural and economic values held by iwi and the community. The concept is expressed in te reo Māori, but applies to freshwater management for and on behalf of the whole community.

The mana of water also applies to "natural form and character", where people value particular natural qualities of an FMU. Matters contributing to the natural form and character of an FMU are its biological, visual and physical characteristics that are valued by the community, including:

- Its biophysical, ecological, geological, geomorphological and morphological aspects
- The natural movement of water and sediment, including hydrological and fluvial processes
- The location of the water body relative to its natural course
- The relative dominance of indigenous flora and fauna
- The presence of culturally significant species
- The colour of the water
- The clarity of the water

3 https://www.mfe.govt.nz/sites/default/files/media/Te%20Mana%20o%20te%20Wai.pdf

There may be FMUs with exceptional, natural and iconic aesthetic features.

The NSP-FM also refers to Māori rights, specifically in Section D where it states the following about tangata whenua roles and interests:

Objective D1

To provide for the involvement of iwi and hapū, and to ensure that tangata whenua values and interests are identified and reflected in the management of fresh water including associated ecosystems, and decision-making regarding freshwater planning, including on how all other objectives of this national policy statement are given effect to.

Policy D1

Local authorities shall take reasonable steps to:

- involve iwi and hapū in the management of fresh water and freshwater ecosystems in the region;
- work with iwi and hapū to identify tangata whenua values and interests in fresh water and freshwater ecosystems in the region; and
- reflect tangata whenua values and interests in the management of, and decision-making regarding, fresh water and freshwater ecosystems in the region.

As described in section 2.1 the NPS-FM requires councils to establish FMUs for all water bodies. FMUs are water management areas that identify and spatially delineate water bodies and surrounding land that drains to those water bodies.

The Committee has identified FMUs or sub-catchments as the appropriate scale for achieving Te Mana o Te Wai. This approach is supported by mana whenua, who recognise the individual mana and mauri of the water bodies that make up the Ruamāhanga River system. They also agree that identifying and connecting people with their environment is the fundamental basis for improving water quality. Linking an FMU directly with the people who have the closest connections with the water body enables catchment communities to take ownership and responsibility for required improvements.

For mana whenua, the FMU relationships with water bodies occur at a hapū/marae level. The mana and mauri of hapū/marae are directly linked to the mana and mauri of their ancestral puna (springs), manga (streams), awa (rivers), roto (lakes) and repo (wetlands). The importance of their waterways is fundamental to their identities and survival as mana whenua. A water body is a source of physical and spiritual strength and nourishment and a connection to a shared cultural landscape inhabited by hapū and whānau members for many generations.

Mahinga kai and Māori customary use values, along with the Ruamāhanga whaitua values, are reflected in the freshwater objectives set for each of the FMUs. To be able to measure progress toward achieving the freshwater objectives, Greater Wellington needs to ensure that the provision of mana whenua values in fresh water is meeting legislative requirements.

The recommendations in this WIP must be consistent with the requirements of the RMA, sections 6(e), 7 and 8, the NPS-FM and the PNRP. The importance of mana whenua relationships with their water bodies is expressed in Schedule B, Ngā Taonga Nui a Kiwa of the PNRP and in recent Treaty of Waitangi settlements.

Recommendation 1

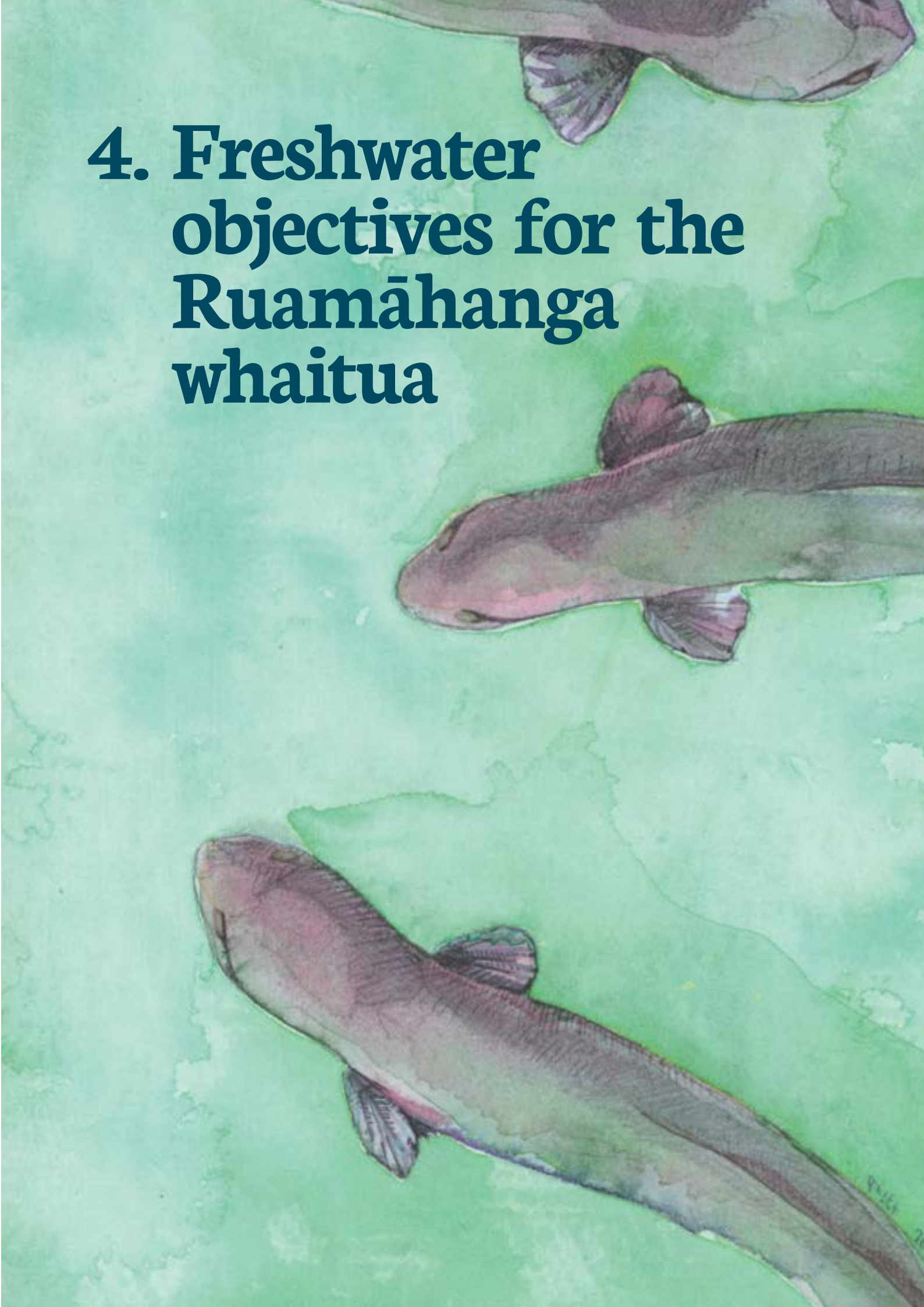
Greater Wellington will:

- Support mana whenua as active partners in the management of the Ruamāhanga whaitua
- Work in partnership with mana whenua to develop a management structure that includes a permanent role for hapū/marae at the FMU level
- Work in partnership with mana whenua to establish and resource a kaitiaki support structure that ensures that Ruamāhanga whaitua hapū and marae are enabled to participate fully in FMU and catchment community planning, including:
  - Identification of indicators
  - Monitoring programme
  - Kaitiaki training
  - Development of matāuranga Māori
- Ensure that sufficient funding and dedicated resourcing to enable mana whenua participation are available as soon as the implementation of an FMU/freshwater objective framework begins
- Establish operative roles for mana whenua and hapū/marae in the management of water quality and quantity and river management activities in the Ruamāhanga whaitua
- Support hapū/marae to develop their own indicators for each FMU, including one for Ruamāhanga as a whole. This process to start as soon as the implementation of an FMU/freshwater objective framework begins
- Include hapū/marae indicators in reporting on progress towards meeting freshwater objectives
- Establish and support the process for mana whenua analysis and interpretation of hapū/marae indicators
- Ensure that hapū/marae are informed through multiple channels of any new resource consent applications or renewals of existing consents within their FMUs, and that their input to the consent process is supported
- Encourage and work with mana whenua on the development and inclusion of mātauranga Māori innovative regulatory and non-regulatory approaches to achieving improved water quality
- Include PNRP Schedule B, Ngā Taonga Nui a Kiwa, which specifies the relationship of Wairarapa mana whenua with Te Awa Tapu o Ruamāhanga in the Ruamāhanga whaitua chapter
- Include PNRP Schedule C, Sites of significance to Wairarapa mana whenua within the Ruamāhanga whaitua in a specific schedule in the Ruamāhanga whaitua chapter

The Committee notes that the opportunity to refresh and redefine the roles and relationships of mana whenua with Greater Wellington can be achieved through the recent introduction of Mana Whakahono ā Rohe (Iwi Participation Arrangements) in legislation.

The Committee further notes that the establishment of the Wairarapa Moana Statutory Board to give effect to treaty settlements is a further opportunity to ensure that whaitua freshwater management is shaped by mana whenua.

4. Freshwater objectives for the Ruamāhanga whaitua



4 Freshwater objectives for the Ruamāhanga whaitua

4.1 Freshwater objectives

The NPS-FM 2014 (amended 2017) requires regional councils to set freshwater objectives in their regional plans. Freshwater objectives are a statement of the desired environmental outcomes for a water body. Put simply, they are descriptions of what a community wants its rivers, streams and lakes to be like. The NPS-FM requires that their states be no worse than they are now (quality is maintained), or the community can decide if they want a water body to be improved (quality is improved). Where the existing state is below a national bottom line, a freshwater objective must be set at the bottom line or higher (and a management regime put in place to achieve this).

Freshwater objectives must be set in detail and at a spatial scale so that the desired outcome for a water body is clear and to justify the management regime that is required to achieve it. The Committee has suggested objectives that maintain water quality in some places and that improve water quality in other places. In many places the decisions allow for maintaining some aspects of quality and improving other aspects in the same place.

The NPS-FM sets out two high-level freshwater objectives that all water bodies in the country must meet:

- To safeguard the life-supporting capacity, ecosystem processes and indigenous species, including their associated ecosystems
- To safeguard the health of people and communities, as affected by contact with fresh water

The PNRP also contains objectives at a regional scale that are relevant to the Ruamāhanga whaitua. The freshwater objectives recommended in this report must achieve these where they relate to the state of water bodies. In particular:

- Mauri is sustained and enhanced
- Aquatic ecosystem health and mahinga kai are safeguarded
- Contact recreation and Māori customary use are provided for
- The health needs of people are provided for
- The natural character of water bodies is preserved and protected

In making decisions on freshwater objectives, and deciding whether water quality should be maintained or how much water quality improvement is desired, the Committee considered how to provide for a wide range of community values, including national values.

4.2 Ruamāhanga whaitua freshwater management units

The NPS-FM directs all regional councils to identify FMUs in their regional plans. FMUs are water management areas that identify and spatially delineate water bodies and the surrounding land that drains to those water bodies. The freshwater objectives and limits need to be set in each of the FMUs. The activities that affect land and water within the boundaries of these FMUs need to be managed in order to meet the freshwater objectives and limits.

Each FMU will have a transparent freshwater accounting system. This means recording information on the measured, modelled or estimated contaminants that are being discharged to fresh water and the amount of fresh water being taken from the FMU. Progress towards the achievement of freshwater objectives in each FMU will be measured at representative sites.

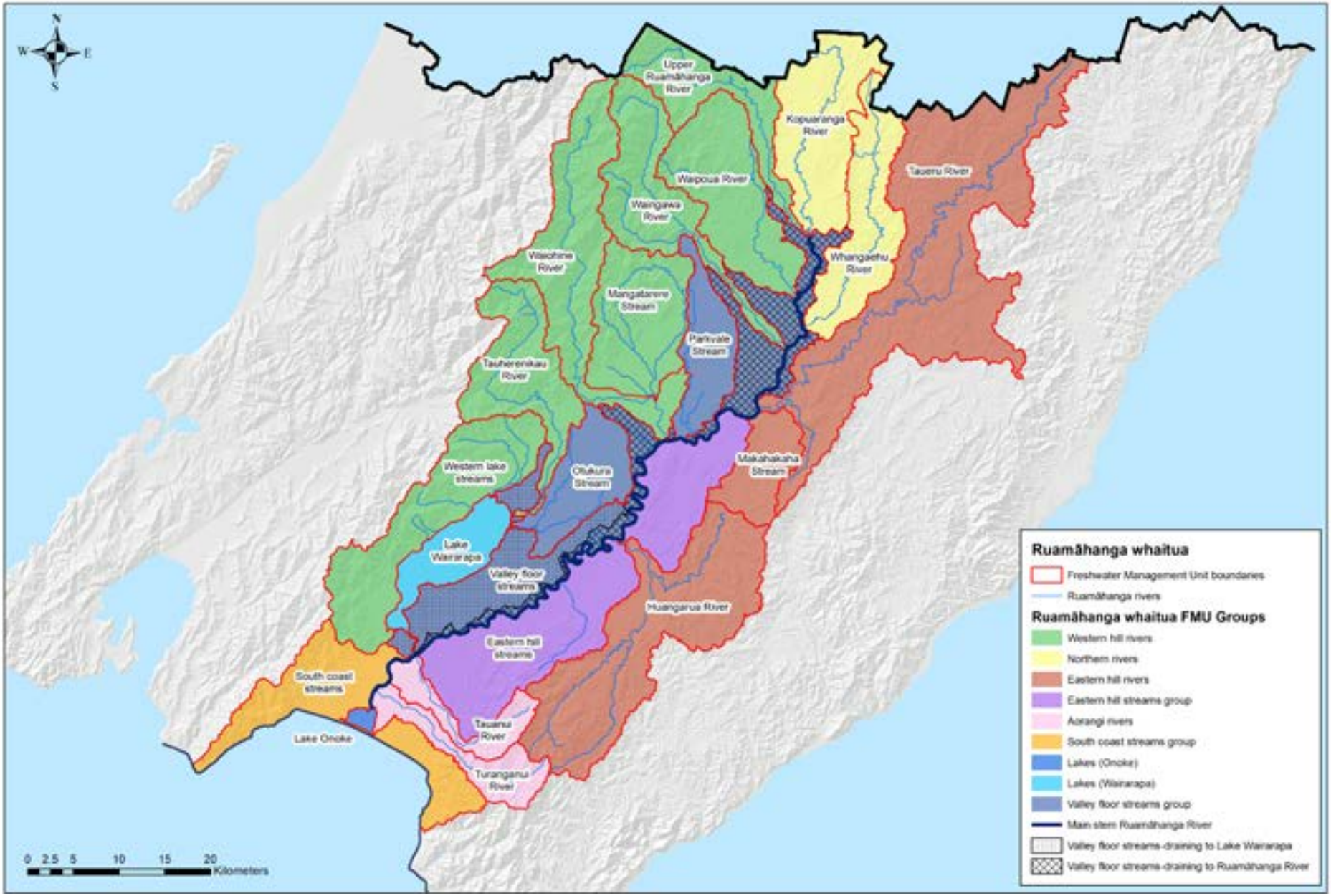
The Committee has identified 21 river FMUs and two lake FMUs. These reflect the following:

- Recognition of how the Ruamāhanga community values are reflected in freshwater bodies across the whaitua
- The Committee's own knowledge of the similarities and differences of major river systems in the whaitua
- A technical analysis undertaken to group rivers and streams based on their similar biophysical (topography, climate and geology) characteristics[4]
- A consideration of the existing delineations of groundwater and surface water zones in the PNRP for managing water allocation
- Bringing this information together into groupings of similar biophysical characteristics, Ruamāhanga values, groundwater and surface water connectivity, surrounding land and its use, and fresh water and social environments

FMUs are also grouped into "like" groups for ease of explanation and management. They have similar geology and hydrology, and can be managed in similar ways (see Figure 4). For example, the Northern rivers FMU group has two FMUs: Kopuaranga and Whangaehu. The groundwater catchment management sub-units, which determine the physical boundaries relevant to water quantity limits, are based on these FMUs and are described in Chapter 8: "Flows and water allocation in the Ruamāhanga whaitua".

4 http://www.gw.govt.nz/assets/Ruamahanga-Whaitua/Defining-a-biophysical-framework-for-FMUs-of-the-Ruamhanga-Whaitua-Report-by-Ton-Snelder-Updated-December-2016.pdf

Figure 4. Map of Ruamāhanga freshwater management unit groups and freshwater management units for lakes and rivers



4.3 Ruamāhanga whaitua freshwater objectives

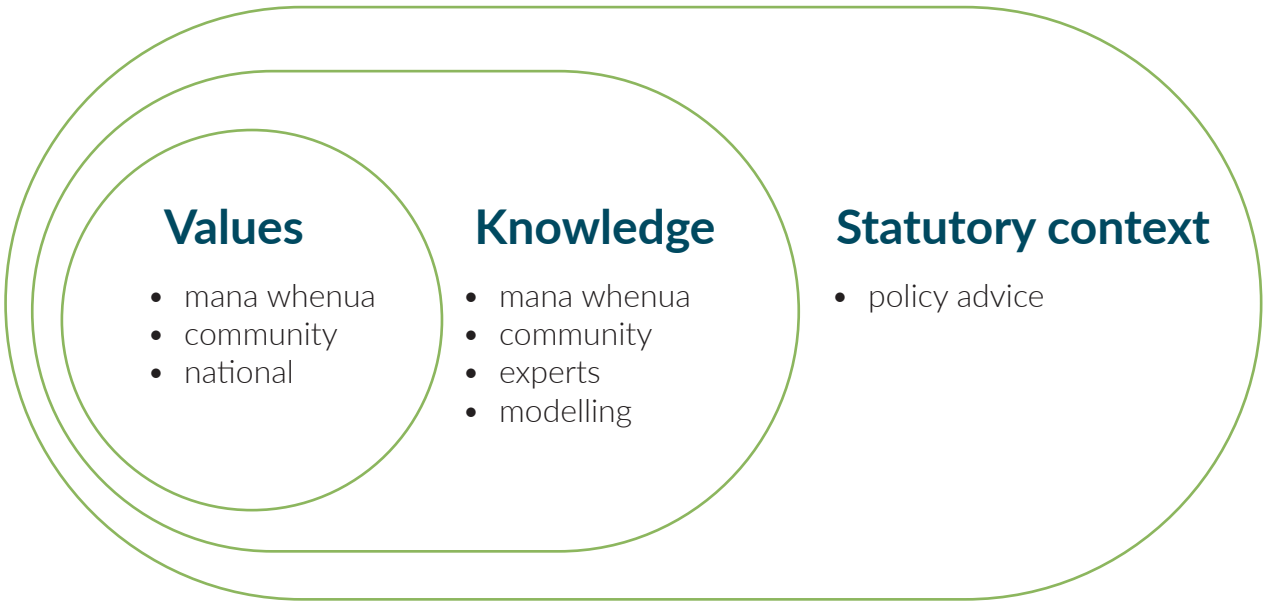
Freshwater objectives describe the environmental outcomes that are to be achieved, and where and when. They can be set at a variety of scales and levels of detail. They can be described narratively or numerically. A numeric objective can be expressed as either a range or a single figure, and a narrative objective may outline an acceptable amount of change, or an outcome.

Where the current state of an FMU is below the national bottom line (as defined in the NPS-FM), the overall water quality within that FMU must be improved to the national bottom line or better. It is compulsory to set freshwater objectives above the bottom line to provide for compulsory and community values. For an FMU that is above the national bottom line, the attribute states must be either maintained or improved. Where there is no provision for an attribute state in the NPS-FM, "maintain" means setting freshwater objectives so that the water quality that provides for the value (e.g. mahinga kai) does not end up worse than it currently is.

Establishing freshwater objectives and setting limits go hand in hand. Limits relate to people's use of freshwater resources and how they manage land. Setting limits describes the maximum amount of resource that is available for use (water taken or contaminant discharged) while still enabling a freshwater objective to be met. Water quality and water quantity limits to meet the objectives described in this chapter are provided in Chapter 7 ("Managing contaminants in the Ruamāhanga whaitua – discharges and land uses") and Chapter 8 ("Flows and water allocation in the Ruamāhanga whaitua").

The Committee's decisions on objectives were shaped by many strands of knowledge (Figure 5). This collective knowledge included everything from local knowledge, gained through personal experiences and engaging with the people of Ruamāhanga whaitua, to expert advice and technical information. They also had to understand and operate within the statutory framework of the RMA.

Figure 5. Setting objectives



The Committee has identified freshwater objectives for all of the FMUs to deliver on their and the community's vision for the Ruamāhanga whaitua, and fulfil the Committee's Terms of Reference. The Committee placed particular emphasis on the extensive nature and important characteristics of small streams, wetlands and backwaters in providing healthy fish habitat and the conditions for mahinga kai species, places, activities and communities to thrive.

The objectives reflecting the vision and outcomes that the Committee set for the Ruamāhanga whaitua fall into four groups:

- Mauri, natural character and habitat
- Fish and mahinga kai objectives, including for specific FMUs, Wairarapa Moana and Lake Ōnoke and relating to additional (to the PNRP) outstanding water bodies
- Sediment reductions
- Water quality, algae and invertebrates in rivers and lakes

Recommendation 2

The Ruamāhanga whaitua chapter of the PNRP includes all the objectives for mauri, natural form and character and habitat, fish and mahinga kai, sediment, and water quality and aquatic ecosystem health as set out in sections 4.3.1, 4.3.2 and 4.3.3 and Tables 8, 9, 10, 11 and 12 in Appendix 3.

4.3.1 Mauri, natural form and character and habitat objectives

The mauri of water bodies is enhanced by restoring ecological habitats (such as through riparian planting), improving water quality and ensuring that healthy and abundant mahinga kai is readily available.

The rivers, streams, lakes and wetlands in the Ruamāhanga whaitua have diverse natural characteristics (e.g. riffles, pools, runs, backwaters and wetland margins) suitable to support abundant and healthy indigenous fauna and taonga species.

Significant indigenous ecosystems in rivers, lakes and wetlands are protected and restored, including habitat for threatened and/or at-risk species, migratory fish and īnanga spawning (as identified in Schedule F of the PNRP).

Indigenous fish and taonga species are able to access all tributaries of the Ruamāhanga system from the coast and lowland wetlands, up to and including first-order streams, throughout the catchment to complete their life cycles.

Adequate habitat space is provided for the life-supporting capacity of indigenous fish and other aquatic life in rivers and streams, including at times of low flow.

4.3.2 Fish and mahinga kai objectives

Across the Ruamāhanga whaitua:

- Tuna fishery is restored and populations are healthy and can sustain recreational and customary harvests
- Wetlands are restored and their extent increased to support thriving mudfish, īnanga spawning and tuna populations
- Urban streams are protected from development and piping to support tuna, kōkopu and redfin bully
- Exotic fish populations are at a level where they are not restricting the vitality of indigenous fish populations and the ability of mana whenua to undertake mahinga kai harvests
- Marae and mana whenua urban communities have access to abundant and healthy mahinga kai species that are safe to eat and are available in quantities that enable sustainable harvests and support the manaakitanga of Wairarapa marae communities
- Watercress is abundant and healthy, safe to eat and free from spray and other contaminants

In the following FMU groups:

- In Western hill rivers, ensure that habitat supports longfin tuna and deep pool habitats, and panoko (torrentfish) are abundant in riffles
- In Eastern rivers, including the Eastern hill rivers and streams groups and the Northern rivers group, reduce sediment and improve habitat to enable tuna to thrive
- In the western lowland rivers (Ruamāhanga River main stem and Valley floor streams FMU group) increase habitat to enable īnanga spawning and deep pools for tuna and riffles for panoko to thrive.

In Wairarapa Moana, including Lake Wairarapa and Lake Ōnoke:

- Exotic fish populations are at a level where they are not restricting the vitality of indigenous fish populations and the ability of mana whenua to undertake mahinga kai harvests
- All age classes of kākahi are present, indicative of a sustainable population
- Black flounder and other saltwater species are abundant
- Tuna fishery is restored and populations are healthy and can sustain recreational and customary harvests
- The Lake Ōnoke mouth is managed to meet the needs of migratory (diadromous) fish species and mahinga kai harvests
- Habitat for native fish indigenous fish is restored

Mahinga kai is abundant and healthy in the following water bodies of significance to Wairarapa marae, mana whenua and the wider Wairarapa community:

- Mākōura Stream
- Kuripuni Stream
- Papawai Stream
- Mangarara Stream
- Carters Reserve
- Tūranganui River
- Tauanui River

4.3.3 Sediment objectives

Stream, river and lake aquatic ecosystem health is improved, including through progressively working towards and then achieving, by 2050, reductions in sediment loads as follows:

- Reducing stream bank and lake bank erosion in all river and lake FMUs in the catchment in accordance with the targets identified in Table 3
- Reducing hill-slope erosion in the FMUs producing the greatest sediment loads off non-native land, in accordance with the targets identified in Table 3. These "top 5" FMUs are the Taueru, Huangarua, Eastern hill streams, Whangaehu and Kopuaranga

4.4 Water quality, algae and invertebrate freshwater objectives for rivers and lakes

The Committee has set freshwater objectives to meet the Ruamāhanga whaitua and compulsory national values, identifying a range of attributes that provide for those values, including the compulsory attributes for rivers and lakes. Some of these attributes are expressed using states A to D as described in the NOF of the NPS-FM, or using the most appropriate equivalent terms (e.g. excellent to poor) for attributes not in the NOF.

These objectives are described for each FMU in sections 4.4.1 to 4.4.10, where they are grouped according to the FMU groups of which they form part. The current states of the freshwater objectives for all these attributes are summarised in Table 5 (for rivers) and Table 6 (for lakes) in Appendix 1. A translation of each objective into a numeric state or further detail is provided in Tables 8-12 of Appendix 3.

The Committee considered many strands of knowledge and information while setting freshwater objectives. Current states were established based on the best data available at the time of analysis. The current states were described using monitored data (to 2017) where it was available. In the absence of monitored data the current states were based on modelled information or expert advice (e.g. by comparing an FMU with water bodies in the same FMU group or a similar FMU group).[5] The recommended improvements were informed by projected states based on model outputs.[6]

5 In the tables below, FMUs where monitored data was used to establish the current state are shown as the letter of the relevant band; FMUs where modelled data was used are shown with an asterisk (*); and FMUs where expert advice was used are shown with a hyphen (-).

6 Modelling reports that informed the freshwater objective setting are available at http://www.gw.govt.nz/ruamahanga-technical-reports.

When considering timeframes, the Committee spent significant time discussing wider impacts on the community. They also considered the degree of effort needed to make improvements in particular shifts from one state to another, and for some attributes the difficulty of achieving any shifts within the existing state. For some attributes, such as Macroinvertebrate Community Index (MCI), the modelling showed that achieving changes in state will be extremely difficult. Attributes such as MCI and periphyton are influenced by multiple variables including habitat, a range of contaminants, temperature, flows, sediment and shade. Achieving improvements may require time and significant investment and effort by everyone in the community. The timeframes for achieving the freshwater objectives are the times by which the water quality must be improved.

The range of modelled mitigations is limited to the currently existing mitigations and their relevant field data collected over time. Not all mitigations can be modelled. The modelling cannot account for any future technical innovations either. Other opportunities such as new technology, better management practices, and land use planning can and will have an impact on reducing the time and cost required to make improvements and achieve positive shifts to meet freshwater objectives. There are opportunities through new partnerships and attracting Wairarapa-specific research, as well as the people of Wairarapa taking up the challenge through innovation and a commitment to improving water quality across the Ruamāhanga whaitua.

4.4.1 Western hill rivers freshwater management unit group

In the Western hill rivers, significant water quality improvement is required for the following NOF attribute:

- The current state of *E. coli* for both the Upper Ruamāhanga and Mangatarere FMUs fails the national bottom line, with the Committee seeking a significant shift from D to C state and D to B state respectively

	E. coli		Periphyton		Ammonia toxicity		Nitrate toxicity		MCI		Achieve by
	Now	Objective	Now	Objective	Now	Objective	Now	Objective	Now	Objective	
Upper Ruamāhanga River	D	C	A	A	A	A	A	A	Fair	Good	2040
Waipoua River	B	A	B*	A	A	A	B	A	Fair	Good	2040
Waingawa River	A	A	A	A	A	A	A	A	Good	Good	Maintain
Mangatarere Stream	D	B	C	B, then A	B	Top of B	B	A	Fair	Good	2040 (2080 for MCI)
Waiōhine River	A	A	A	A	A	A	A	A	Fair	Good	2080
Tauherenīkau River	A	A	A*	A	A	A	A	A	Fair	Good	2040
Western lake streams	-	A	-	A	-	A	-	A	-	Good or better	Maintain

This FMU group is large, with many large rivers (Upper Ruamāhanga, Waipoua, Waingawa, Waiōhine and Tauherenīkau) and relatively high rainfall headwaters. It is characterised by hard rock and steep catchments in the headwaters of the Tararua Range, and low-gradient, alluvial gravel-bed rivers on the valley floor with high connection to groundwater. It has relatively high base flows and frequent flushing events.

Many Western hill rivers have high recreational values (swimming, kayaking and fishing) and are identified as regionally significant recreational waterways under Schedule H1 of the PNRP. Many of the popular swimming holes dry out during summer or are no longer suitable for contact recreation due to poor water quality. The Ruamāhanga River also contains valued aquatic ecosystems, including significant indigenous fish species (Schedule F1) and birds (Schedule F2). In particular, the stretch between Rathkeale College and the Te Ore Ore Road bridge provides breeding habitat for the entire population of black-billed gulls in the region. This stretch also provides habitat for banded dotterel, black shag, pied stilt and New Zealand pipit.

Both Mangatarere and Waipoua are identified as having significance for trout spawning and habitat. The Waipoua River is identified in the PNRP (Schedule F1) as having significant biodiversity values for threatened and at-risk indigenous fish species. Matewera is identified as a site of significance for mahinga kai in Schedule C5 of the PNRP.

Ruamāhanga confluences are places of great significance to mana whenua, along with many other sites along the Western hill rivers which are valued as wāhi tapu, mahinga kai, harvesting materials and baptism sites.

The Waingawa, Mangatarere and Waiōhine Rivers provide town water supply and a number of water races. Many of the rivers are affected by flood management regimes and gravel extraction, which have significant impacts on macroinvertebrate health. The Waiōhine River has good water quality and ecological health in its forested headwaters, contrasting with MCI scores at the very bottom of the fair grade farther down in the catchment where the river has been subject to ongoing mechanical disturbance. The rivers in the Western hill rivers FMU, even though some have high water quality, are under pressure particularly during summers, in part due to abstractions, urban wastewater and stormwater discharges, industrial and agricultural discharges and riverbed disturbance.

Monitored and modelled data shows that both the Upper Ruamāhanga and Mangatarere sites fail the national bottom line for *E. coli*. Modelling shows that from the Silver 2025 scenario onwards, the Upper Ruamāhanga shifts to C state. Modelling also indicates that for the Upper Ruamāhanga the estimate of the contribution of *E. coli* load from the Kopuaranga River is significant (75-90% derived from Kopuaranga).

4.4.2 Northern rivers freshwater management unit group

In the Northern rivers FMU group, significant water quality improvement is required for the following NOF attributes:

- The current state for *E. coli* in both the Kopuaranga and Whangaehu Rivers fails the national bottom line and requires a significant shift from D to C state
- The current state for periphyton in the Kopuaranga fails the national bottom line and requires a shift from D to C state. This is also the most likely case for Whangaehu

	E. coli		Periphyton		Ammonia toxicity		Nitrate toxicity		MCI		Achieve by
	Now	Objective	Now	Objective	Now	Objective	Now	Objective	Now	Objective	
Kopuaranga River	D	C	D	C	A	A	A	A	Fair	Good	2040
Whangaehu River	D	C	-	C	A	A	A	A	Fair*	Good	2040

The Northern rivers FMU group comprises the catchments of the Kopuaranga and Whangaehu Rivers. This FMU group is predominantly under pasture, with a mixture of sheep and beef, dairy and dairy support land uses. These rivers have moderate rainfall with softer rock catchments, a lower summer base flow and less frequent flushing flows.

The confluence of the Kopuaranga River with the Ruamāhanga River, at the Kohekutu Pā and Kairangi Stream, is an important place for mana whenua for pā tuna and mahinga kai. This area is listed as a site of significance for mana whenua in Schedule C5 of the PNRP. The Whangaehu River is identified in the PNRP (Schedule F1) as having significant biodivrsity values for threatened and at-risk indigenous fish species, including the banded kōkopu, giant kōkopu, longfin eel and upland bully. Both the Kopuaranga and Whangaehu Rivers are recognised as having significant trout fishery and trout-spawning values (Schedule I) and are also identified in Schedule H2 as a priority for improvement for secondary contact recreation.

There are concerns that when silt builds up at river confluences it may affect fish migration. Reducing sediment in streams will help improve MCI, and along with lowering water temperature better manage algal growth.

Both Kopuaranga and Whangaehu are below the NOF national bottom line for *E. coli* and for periphyton. The national target for improvement in water quality for swimmability (i.e. 90% length of rivers swimmable by 2040) drives the timeframes for improvement in water quality. There is little data on periphyton for Whangaehu, and the freshwater objective for periphyton has been set based on the periphyton information for Kopuaranga.

Modelling outputs show very little shift in water quality attributes under different scenarios, particularly for *E.coli*, periphyton and MCI. This indicates that improving water quality in the catchments will require a significant effort. Modelling for Kopuaranga shows that the mitigations modelled in all the scenarios, including the Gold 2080 scenario do not shift *E. coli* from D state. However, it is likely that implementing mitigations to meet the *E.coli* objective by 2040 will have benefits in meeting other objectives as well.

4.4.3 Eastern hill rivers freshwater management unit group

In the Eastern hill rivers, significant water quality improvement is required for the following NOF attribute:

- The current state of periphyton in the Taueru River fails the national bottom line and requires a shift from D to C state

	E. coli		Periphyton		Ammonia toxicity		Nitrate toxicity		MCI		Achieve by
	Now	Objective	Now	Objective	Now	Objective	Now	Objective	Now	Objective	
Taueru River	C	C	D*	C	A	A	B	A	Good	Good	2040
Makahakaha Stream	A*	A	-	B	A*	A	B*	A	Fair*	Good	2040 (periphyton 2030)
Huangarua River	B	B	C	B	A	A	A	A	Fair	Good	2040 (2080 for MCI)

The Eastern hill rivers FMU group includes the larger rivers (Taueru and Huangarua). The catchments are characterised by moderate to low rainfall and soft sediment soils. The rivers and streams in this FMU group are characterised by low flows, increased in-stream temperatures in summer, a lack of flushing flows, and at times high sediment loads.

Many of the streams have significant mana whenua values, including being close to Hurunui o Rangi and Papawai marae. The Taueru River has high mahinga kai values and was once valued for recreation and as a tuna fishery. The Taueru and Huangarua Rivers are recognised as significant trout fisheries and spawning waters as identified in Schedule I of the PNRP. They are also listed in Schedule H2 of the PNRP as rivers with second priority for the improvement of fresh and coastal water quality for contact recreation and Māori customary use.

Riparian planting is inconsistent across the catchment, especially in its upper reaches. Planting and shading would help to lower the in-stream temperatures, as well as reduce nitrate, which would most likely help to improve periphyton. The catchment has limited monitoring data. There is some intensive farming and irrigated dairy, sheep and beef, and viticulture.

The modelling outputs show that a shift in periphyton is possible. The cost of change is likely to be significant because the FMU has predominantly sheep and beef farming. Sheep and beef farmers would require incentives and support to implement the level of mitigation required for improvement. Economic analysis shows that the sheep and beef industry has the largest reduction in net revenue and bears the largest total mitigation cost in the agricultural sector.

4.4.4 Eastern hill streams freshwater management unit group

The Eastern hill streams FMU is characterised by small streams with very low flows that often dry out in summer. This catchment has some of the lowest average annual rainfall of any catchment in the North Island. The catchment is a mix of soft and hard sediment.

	E. coli		Periphyton		Ammonia toxicity		Nitrate toxicity		MCI		Achieve by
	Now	Objective	Now	Objective	Now	Objective	Now	Objective	Now	Objective	
Eastern hill streams	-	B	-	B	-	A	-	A	-	Fair	Maintain

There is no observed data for any of the streams in the Eastern hill streams group. Based on local and expert knowledge, a proxy site (Huangarua at Ponatahi Bridge) has been used to set objectives for this FMU group.

4.4.5 Valley floor streams freshwater management unit group

The Valley floor streams FMU group requires significant water quality improvement for the following NOF attributes:

- The current state of *E. coli* in the Parkvale Stream fails the national bottom line and requires a significant shift from E to C state
- The current state of *E. coli* in the Otukura Stream fails the national bottom line (modelled) and requires a significant shift from D to C state

	E. coli		Periphyton		Ammonia toxicity		Nitrate toxicity		MCI		Achieve by
	Now	Objective	Now	Objective	Now	Objective	Now	Objective	Now	Objective	
Parkvale Stream	E	C	B	B	B	A	B	A	Fair*	Good	2040
Otukura Stream	D*	C	-	B	B*	A	B*	A	-	Fair	2040
Other Valley floor streams	-	C	-	B	-	A	-	A	-	Good	2040

The Valley floor streams FMU group has a dry climate. It is characterised by small streams with hard sediment and some silty bed channels, predominantly spring fed. Two sub-catchments – the Parkvale and Otukura Streams – have been identified as their own FMUs, with all other streams and catchments (including Papawai, Mākōura, Kuripuni and Mangarara Streams and Carters Reserve) grouped as "Other Valley floor streams".

The Parkvale Stream is identified in Schedule H2 of the PNRP as a second priority water body for improvements for secondary contact recreation. There are strong signals from the community and mana whenua to improve the Parkvale Stream water quality. The stream is also known for traditional mahinga kai gathering (watercress).

Farming is predominantly dairy and dairy support. Due to characteristically thin soils, groundwater and closely connected surface water are exposed to pollution by highly soluble contaminants such as nitrates. Habitat is poor in many Valley floor streams and sometimes over-dominated by macrophytes. The habitat can be enhanced through riparian planting, wetland restoration and considering the impacts of flows. Both FMUs (Parkvale Stream and Otukura Stream) are smaller than some of the other FMUs and it is potentially easier to mitigate some of the risks affecting them.

The Parkvale Stream fails the national bottom line for *E. coli*, which is a national driver for improvement in water quality for swimmability. Modelling shows high *E. coli* levels are driven through high rainfall. This indicates that mitigation efforts should focus on managing overland flow and critical source areas. The stream is used for supplying stock water, so the improvements in *E. coli* will have a positive effect on the economic value (stock health) as well as other values.

The Parkvale Stream has the highest nitrate levels of any monitored waterway in the Ruamāhanga whaitua. Investigations indicate this may be attributable to a range of activities, including current industrial discharges and farming.[7] The stream is also affected by low flows and a lack of shading, providing optimal conditions for periphyton growth. There are concerns about the potential impacts of winter grazing activities in the Parkvale catchment. Other contaminants from industrial areas are also likely to be present in the Parkvale Stream.

Improvement for the Parkvale Stream is likely to be economically more feasible than it is for some of the other FMUs. The farm systems in the catchment are highly productive, meaning fencing and riparian planting costs may have lesser economic impacts on the farm businesses. It is a small stream where reducing nutrient concentrations, coupled with shading, may result in significant water quality improvement.

The Otukura Stream does not have any State of the Environment monitoring and the current state and objectives have been based on best knowledge of the catchment and information on similar FMUs (other streams in the Valley floor FMU). The modelling outputs show that it is hard to improve *E. coli* levels in this stream, but improvement is needed as it is modelled as being below the national bottom line. The modelling through to the Gold 2080 scenario only shifts the *E. coli* C state.

7 http://www.gw.govt.nz/assets/Our-Environment/Environmental-monitoring/Environmental-Reporting/Waingawa-Groundwater-Quality-Study.pdf

The "Other Valley floor streams" include the Papawai, Mākōura, Kuripuni and Mangarara Streams and Carters Reserve. There are many places of high cultural and ecological value e.g. Carters Reserve. The streams are small in length and area and the habitat is often poor and sometimes dominated by macrophytes. An absence of modelling or monitoring information means the current state and objectives of this FMU have been based on best knowledge of the catchment and looking at information on similar FMUs i.e. the Otukura and Parkvale Streams.

4.4.6 Aorangi rivers freshwater management unit group

The Aorangi rivers require significant water quality improvement for the following NOF attributes:

- The current state of periphyton in the Tauanui and Tūranganui rivers requires a shift from an estimated C or D state to B state
- The current state of *E. coli* in the Tauanui River fails the national bottom line and requires a significant shift from D state to the Committee's recommendation of an A state

	E. coli		Periphyton		Ammonia toxicity		Nitrate toxicity		MCI		Achieve by
	Now	Objective	Now	Objective	Now	Objective	Now	Objective	Now	Objective	
Tauanui River	D*	A	C/D*	B	A*	A	A*	A	Fair*	Good	2040
Tūranganui River	B*	B	C/D*	B	A*	A	A*	A	Fair*	Good	2040

The Aorangi rivers FMU group is a relatively steep catchment with forested upper reaches. The Tauanui and Tūranganui Rivers characterise this FMU group. The Tūranganui River provides water used in intensive dairying and sheep and beef farming. In recent years, driven by both a drying climate and water abstractions (some not restricted at low flows), both rivers have experienced very low flows and drying up, affecting the Pirinoa community water supply and recreational values (swimming holes drying out), and putting pressure on the indigenous fish population.

The modelling for the Tauanui River shows potential for a sizable shift in *E. coli* concentrations with the implementation of a range of mitigations.[8] The national target for improvement in water quality for swimmability (i.e. 90% length of rivers swimmable by 2040) drives the timeframes for improvements in *E. coli* and periphyton.

There is anecdotal evidence of periphyton present in the Tauanui River. The upper reaches of the catchment are actively deforested, affecting sediment discharge. There are a number of sites of significance for mana whenua along both rivers. Both rivers are listed in Schedule F1 of the PNRP as having significant indigenous ecosystems, with habitat for indigenous threatened/at-risk fish species and habitat for migratory indigenous fish species. This is a small catchment with a short reach and the improvements might be easier than elsewhere to achieve.

8 http://www.gw.govt.nz/assets/Modelling-Farm-scale-Mitigation-Options-for-the-Ruamahanga-Whaitua-Collaborative-Modelling-Project-June-2016.pdf

4.4.7 Ruamāhanga River main stem freshwater management unit group

The Ruamāhanga River main stem FMU group comprises the river channel itself downstream of the confluence with the Kopuaranga River (see Figure 4). For the purposes of setting objectives, the Committee has divided the main stem into five locations (Wardells, Gladstone Bridge, Waihenga, Pukio and upstream of the confluence with the outlet from Lake Wairarapa).

The Ruamāhanga River main stem requires significant water quality improvement for the following NOF attribute:

- The current state of *E. coli* in the Ruamāhanga River at Gladstone Bridge fails the national bottom line and requires a significant shift from D to C state

Ruamāhanga River main stem at	*E. coli*		Periphyton		Ammonia toxicity		Nitrate toxicity		MCI		Achieve by
	Now	Objective	Now	Objective	Now	Objective	Now	Objective	Now	Objective	
Wardells	C*	C	B*	B	B*	A	A*	A	Fair*	Fair	2040
Gladstone Bridge	D	C	B	B	B	A	A	A	Fair*	Fair	2040
Waihenga	A	A	B	B	B*	A	A*	A	Fair*	Fair	2040
Pukio	B	B	-	B	A*	A	A*	A	Good*	Good	Maintain
Upstream of confluence with Lake Wairarapa outlet	B*	B	-	B	A*	A	A*	A	Fair*	Fair	Maintain

The Ruamāhanga River is the largest river in the whaitua, with relatively high rainfall in headwaters. It is characterised by hard rock and steep catchment in the headwaters in the Tararua Range, and low-gradient alluvial gravel bed on the valley floor with high connection to groundwater. It has relatively high base flows and frequent flushing events. It is the receiving water body for the streams and rivers of the catchment discharging directly into Lake Ōnoke.

As the Ruamāhanga River is the major river of the catchment, the objectives for the main stem are largely driven by management of the catchments that feed into it. Several municipal wastewater treatment plants discharge directly or indirectly into the river or a tributary and/or to adjacent land. The main stem is popular for trout fishing and recreation such as swimming and kayaking. Popular swimming spot the Cliffs is often affected by increased *E. coli* levels. It should, however, be noted that improvements to the Masterton District Council wastewater treatment plant in the past few years, including increases in the volume of wastewater discharged to land, have likely led to improvements in *E. coli* levels in the Ruamāhanga main stem at the Wardells location.

The Ruamāhanga River main stem FMU is defined for the purposes of this WIP as the river below Double Bridges – the upper reaches are part of the Upper Ruamāhanga FMU. Reflecting its size and importance and the role of multiple sub-catchments in the outcomes in the main stem, five locations have been identified to set freshwater objectives along its journey to Lake Ōnoke.

Monitoring data for the Ruamāhanga River at Gladstone Bridge shows that the site fails the national bottom line for *E. coli*. The Committee's freshwater objective for *E. coli* in the Ruamāhanga River at Gladstone Bridge require a shift from D to C state. Modelling shows it is difficult to improve *E. coli* levels. The simulations through to the Gold 2080 scenario indicate that the site remains in C state.

The national target for improvement in water quality for swimmability (i.e. 90% length of rivers swimmable by 2040) drives the timeframes for improvement in *E. coli*.

The state of periphyton in the main stem is also difficult to improve due to the nutrient loads coming from catchments upstream and the river being too wide for shading as a management option. The loss of natural character as a result of flood management results also in habitat loss, especially for fish. Mana whenua have sent a strong signal that they want to see an improvement, in particular at the Ruamāhanga River at Wardells, as it was once a site of high cultural use and recreational value.

4.4.8 South coast streams freshwater management unit group

	E. coli		Periphyton		Ammonia toxicity		Nitrate toxicity		MCI		Achieve by
	Now	Objective	Now	Objective	Now	Objective	Now	Objective	Now	Objective	
South coast streams	-	A	-	A	-	A	-	A	-	Fair	Maintain

The South coast streams FMU covers a series of small catchments that flow directly to the sea at the very south of the whaitua, and include streams such as the Wharekauhau and Whāngaimoana Streams. These are a mix of steep and lowland streams, with many of the steeper streams having forest or scrub in their upper catchments.

An absence of modelling or monitoring information means the current state and objectives of this FMU have been based on best knowledge of the catchment and information on similar FMUs and water bodies i.e. the Western hill rivers.

4.4.9 Lake Wairarapa

The current state of phytoplankton and total phosphorus in Lake Wairarapa fails the national bottom lines and requires a significant shift from D to C state.

The Committee is seeking progressive improvements in the health of Lake Wairarapa, so that these significant shifts in objectives are reached by 2080.

NOF attributes

	E. coli		Phytoplankton		Total nitrogen		Total phosphorus		Ammonia toxicity	
	Now	Objective	Now	Objective	Now	Objective	Now	Objective	Now	Objective
Lake Wairarapa	A	A	D	C	C	C	D	C	A	A

Non-NOF attributes

	Trophic level index		Total suspended sediment		Macrophytes	
	Now	Objective	Now	Objective	Now	Objective
Lake Wairarapa	Very poor	Poor	Poor	Fair	D	C

Lake Wairarapa, including its wetland margins and connecting waterways (more generally known as Wairarapa Moana), is greatly valued for its community and mana whenua values, including mahinga kai, fish populations and bird habitats. Both lakes are significant sites for mana whenua. A brief discussion of their value, including how they are recognised under a water conservation order (WCO) and through the Treaty of Waitangi settlements with Ngāti Kahungunu ki Wairarapa and Rangitāne ō Wairarapa, is provided in section 6.3 as part of a discussion on the policy packages for managing rivers and lakes in the Ruamāhanga whaitua.

Lake Wairarapa is below national bottom lines for phosphorus and phytoplankton levels, with the lake rated as being in a supertrophic state. Due to the large, shallow nature of Lake Wairarapa, it is very susceptible to sediment re-suspension. A key priority will be to reduce sediment and phosphorus deposited from the catchment upstream (rather than reduce nitrogen), particularly through focusing on reducing the re-suspension of sediment already in the lake.

Modelling shows it is difficult to improve the lake's health by focusing on reducing the catchment sediment load only. However, "in-lake methods" modelled, such as restoring the flows of the Ruamāhanga River below median flow into Lake Wairarapa and maintaining higher lake levels, show promising results. When these options are coupled with reducing the catchment sediment load, the health of the lake shows promising improvement and also potential for establishing macrophytes. A further investigation of in-lake methods is required.

4.4.10 Lake Ōnoke

The Committee is seeking progressive improvements in the health of Lake Ōnoke so that objectives are reached by 2040.

NOF attributes

	E. coli		Phytoplankton		Total nitrogen		Total phosphorus		Ammonia toxicity	
	Now	Objective	Now	Objective	Now	Objective	Now	Objective	Now	Objective
Lake Ōnoke	B/C	A	B	B	C	B	B	B	A	A

Non-NOF attributes

	Trophic level index		Total suspended sediment		Macrophytes	
	Now	Objective	Now	Objective	Now	Objective
Lake Ōnoke	Poor	Average	Poor	Fair	D	C

Lake Ōnoke is a significant indigenous ecosystem. It has significant recreational values (important recreational fishing) and mana whenua values, as well as being significant for migratory fish.

Modelling shows it is difficult to improve the lake's health by focusing on reducing the catchment sediment load only. However, it shows potential in reducing sediment inputs and improving the ability of the lake to flush to improve sediment, the trophic level index and macrophyte outcomes.

Modelling shows that nutrient levels can be improved and at least maintained, but that the health of Lake Wairarapa will limit the health of Lake Ōnoke.

4.5 Achieving periphyton and macroinvertebrate objectives

4.5.1 Periphyton

An analysis of modelling outputs demonstrates that to achieve periphyton objectives, managing only nitrogen and phosphorus will not achieve the desired objectives. For example, to meet the desired "A" attribute state at the Mangatarere River at State Highway 2 a 99.51% reduction in total nitrogen and/or a 99.56% reduction in dissolved reactive phosphorus from the current baseline is needed.[9] Other factors, such as flow regimes (i.e. minimum flow and allocation limits), frequency of flushing flows, riparian condition, water temperature, photosynthetic active radiation and habitat are significant variables regulating periphyton biomass.

The Committee recognises that to meet the periphyton objectives identified in this chapter, multiple management options need to be implemented across the whaitua. The Committee's specific recommendations around the policy approach to achieving these reductions are identified in the subsequent policy package chapters. In order to provide clarity about these multiple dimensions in the subsequent plan change from this WIP, the Committee recommends a policy describing these parts.

9 http://www.gw.govt.nz/assets/Ruamahanga-Whaitua/Setting-nutrient-criteria-to-achieve-desired-periphyton-attribute-states-in-Ruamhanga-Whaitua-January-2018.pdf

Recommendation 3

The PNRP includes a policy that describes how the periphyton objectives in this WIP will be achieved by the following approaches:

- Achieving the in-stream nutrient criteria for periphyton set out in Table 1.
- Achieving the nutrient targets for diffuse sources in Table 2 and for point-source load reductions in Table 4.
- Achieving the sediment load reductions in Table 3.
- Undertaking extensive riparian planting for the purpose of creating suitable shading for streams to reduce temperatures and photosynthetic active radiation.
- Ensuring that any consented in-stream works and activities maintain or restore flushing flows suitable to avoid nuisance periphyton build-up.

4.5.2 Macroinvertebrate community health

The health of the macroinvertebrate community is one of the main indicators used internationally and in New Zealand to assess the ecological health of a stream or river, because macroinvertebrate communities are sensitive to a wide range of stressors, including the degradation of water quality and habitat. The effects of these stressors can be both direct (e.g. nitrate toxicity) and indirect (e.g. an increase in nutrients causes periphyton blooms that reduce habitat quality) and operate at both local (e.g. removal of riparian margin) and catchment (e.g. eutrophication from upstream agricultural land use) scales. In New Zealand the MCI is the most widely used measure of macroinvertebrate community health.

Modelling scenario outputs does not show much improvement in the MCI. This is predominantly due to no changes in deposited fine sediment, which is controlled primarily by flood management regimes of the rivers (which do not change under any scenarios). It is important to note that a suspended sediment reduction under all scenarios has no influence on deposited fine sediment (research shows there is very weak empirical evidence for such a relationship[10]).

The restoration of macroinvertebrate communities, and improvements in the state of macroinvertebrate community health, are influenced by the multiple stressors and the different scales at which these stressors may affect macroinvertebrate communities. Habitat restoration, such as developing mature riparian margins and introducing submerged woody debris, can take decades to achieve. Improvements in macroinvertebrate community health are also dependent on the availability of nearby colonisation sources (e.g. from macroinvertebrates drifting in river flow from upstream habitat patches or flying adult insects).

We need to manage many things in order to achieve MCI objectives, including flows (minimum and allocation limits), nutrients (because these affect periphyton, which in turn indirectly affects invertebrates), sediment (because it affects invertebrate habitat) and riparian condition (it affects habitat as well as periphyton growth).

10 See Hicks et al 2016. Sediment attributes Stage 1. Report prepared by NIWA for the Ministry for the Environment, June 2016, Client report no. CHC2016-058

Recommendation 4

The PNRP includes a policy that describes how the macroinvertebrate community health objectives (indicated by the MCI) in this WIP will be achieved by the following approaches:

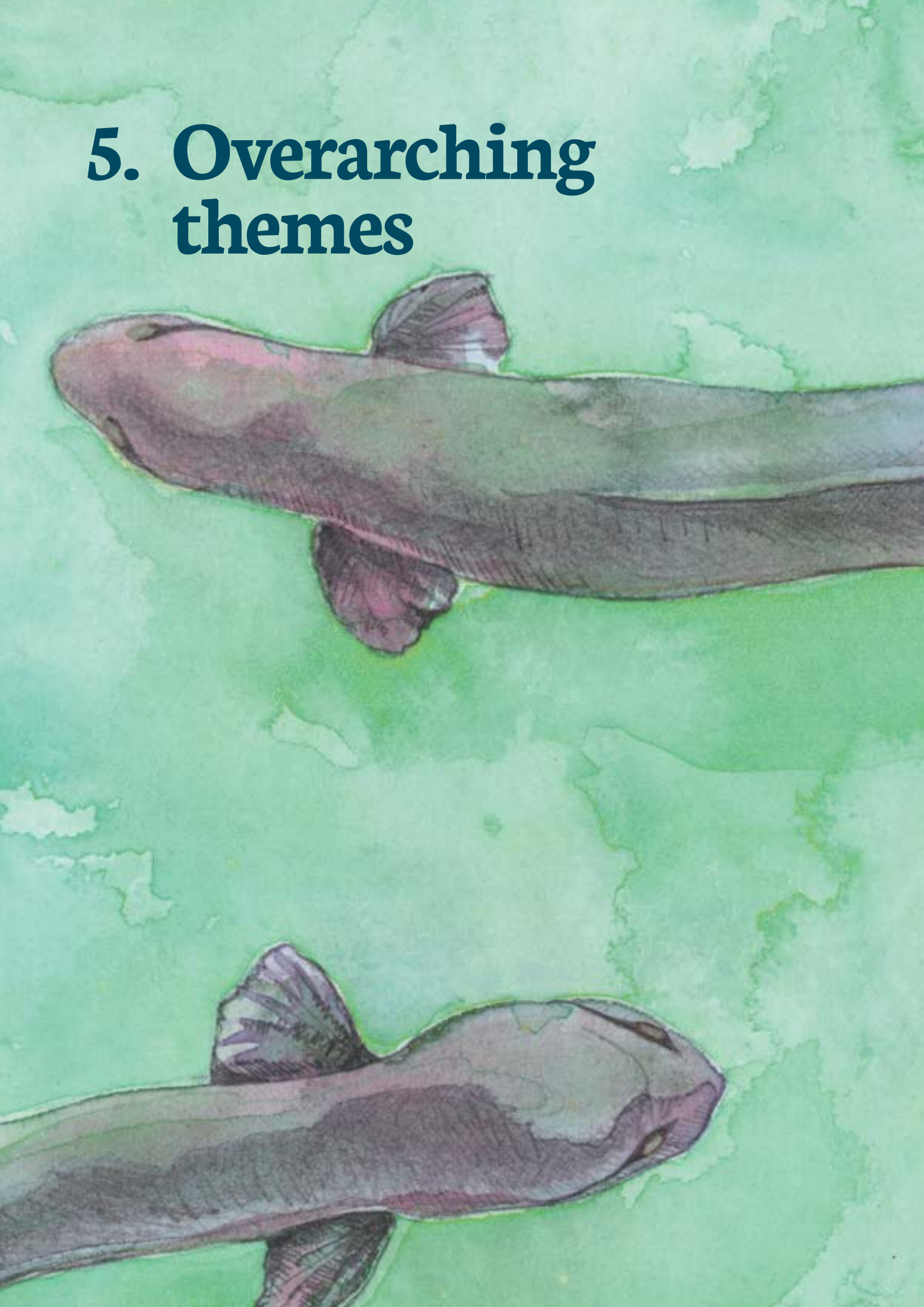
- Achieving the in-stream nutrient criteria for the management of periphyton in Table 1.
- Achieving the nutrient targets for diffuse-source and point-source loads in Table 2 and Table 4.
- Achieving the sediment load reductions in Table 3.
- Undertaking extensive riparian planting to reduce water temperatures, reduce fine sediment inputs from stream bank erosion, increase organic matter input (as a food source) and provide habitat for adult insects to colonise from.
- Retaining and improving the natural character of water bodies, such as riffles, pools and runs.
- Ensuring that any consented in-stream works and activities are managed to minimise the release of deposited fine sediment.
- Progressively reducing the use, frequency and extensiveness of mechanical in-stream disturbances in flood protection, drainage and gravel-extraction activities.
- Greater Wellington facilitating, and implementing the findings of, research to identify innovative approaches to improve macroinvertebrate community health, as sought by Recommendation 9 of this WIP.

Table 1. In-stream nutrient criteria for the management of periphyton[11]

	Nutrient criteria (concentrations)			
	Dissolved inorganic nitrogen (DIN) (mg/L)		Dissolved reactive phosphorus (DRP) (mg/L)	
Freshwater management unit	Median	95th percentile	Median	95th percentile
Eastern hill streams	0.23	0.67	0.006	0.029
Huangarua River	0.23	0.67	0.006	0.029
Kopuaranga River	0.82	1.20	0.011	0.018
Makahakaha Stream	0.74	1.52	0.011	0.017
Mangatarere Stream	1.02	1.63	0.018	0.076
Otukura Stream	1.01	1.35	0.004	0.008
Parkvale Stream	1.01	1.55	0.019	0.051
Ruamāhanga River – Gladstone Bridge	0.32	1.01	0.006	0.024
Ruamāhanga River – Pukio	0.33	0.97	0.007	0.021
Ruamāhanga River – upstream of confluence with Lake Wairarapa outlet	0.40	1.01	0.007	0.020
Ruamāhanga River – Waihenga	0.50	0.88	0.006	0.019
Ruamāhanga River – Wardells	0.55	1.29	0.009	0.021
South coast streams	0.04	0.15	0.004	0.005
Tauanui River	0.13	0.35	0.004	0.007
Taueru River	0.71	1.45	0.009	0.021
Tauherenīkau River	0.04	0.15	0.004	0.005
Tūranganui River	0.16	0.65	0.005	0.021
Upper Ruamāhanga River (at Double Bridges)	0.10	0.45	0.005	0.009
Valley floor streams – draining to Lake Wairarapa	1.01	1.35	0.004	0.008
Valley floor streams – draining to Ruamāhanga River	1.01	1.35	0.004	0.008
Waingawa River	0.07	0.24	0.004	0.006
Waiōhine River	0.35	0.87	0.006	0.023
Waipoua River	0.63	1.42	0.003	0.004
Western lake streams	0.04	0.15	0.004	0.005
Whangaehu River	0.48	1.55	0.023	0.045

11 As required by the NPS-FM (amended 2017), Appendix 2, National Objectives Framework note to periphyton attribute table (p34)

5. Overarching themes



5 Overarching themes

During the course of the Committee's extensive work, a number of key themes have emerged that provide a strong foundation for the entire WIP direction. These themes cut across the policy packages and provide context and direction for decisions on objectives and timeframes. They provide insights into the intent of the Committee's direction for land and water management in the whaitua for the next 10 years and beyond. The themes cover:

- Ensuring integrated land and water management
- Ensuring effective implementation of the whole of the WIP
- Promoting innovation
- Seeking good management practice (GMP) across sectors and activities
- Improving the efficient use of water in an increasingly water-constrained environment
- Being equitable across the community
- Improving how we monitor, account for resource use and review progress

5.1 Ensuring integrated land and water management

The Committee supports a comprehensive and integrated land and water management system for the Ruamāhanga whaitua. It is vital that we make better use of the available water resource as we enter an era of increasing shortage under climate change.

In the past, land use, water quality and water quantity tended to have been managed separately. The PNRP pulls these together with combined objectives, policies and rules in one regional plan. The aim of this WIP is to improve the integration of resource management practices, reflecting a "whole-of-catchment" approach.

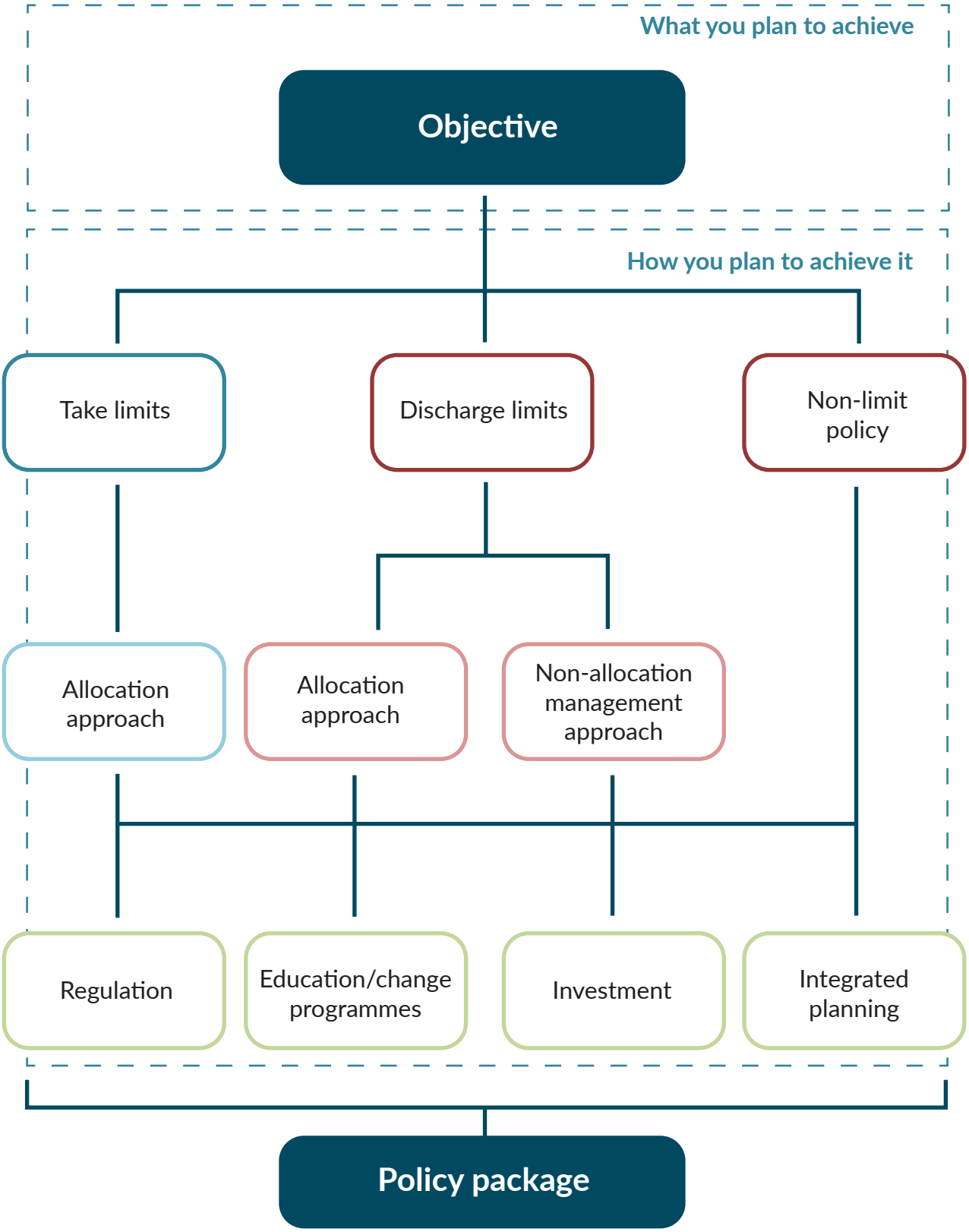
Recommendation 5

The Ruamāhanga whaitua integrated land and water management system should:

- Seek to be a comprehensive, catchment-wide system that increases ecological and social health and wellbeing as well as improving water use reliability
- Create resilience to the pressures of changing weather systems under climate change
- Empower communities to identify and implement suitable processes and management options in their sub-catchments in order to contribute to the whaitua-wide approach.

In order to create a package of recommendations to deliver on this integrated land and water management approach, the following policy framework has been applied as part of developing the WIP recommendations. The "policy package" (Figure 6) describes the tools or levers that can be used together to deliver an objective (what you want to achieve). In the case of land and water management and the policy approach of the NPS-FM, this requires freshwater objectives to be met through both the setting of take limits and discharge limits, and other approaches not driven by limits (called here "non-limit policies"). To meet these limits and non-limit policies, further choices lie in whether to allocate limits to individuals and in the tools that are used to deliver on the policy package choices – whether through regulation, education and change programmes, investment or further planning (e.g. sub-catchment planning, farm planning).

Figure 6. Parts of a policy package



In developing this WIP package, the Committee has considered options and ideas from all parts of the policy package framework. Ultimately, the ability to achieve an objective depends on the combinations and interactions of the various tools in the package.

5.2 Ensuring effective implementation of the whole of the WIP

or the implementation of the WIP to be effective, Greater Wellington, partners and stakeholders need to work together to deliver successfully the breadth of the Committee's recommendations in order to seek the opportunities and innovations that exist. The Committee has stated strongly that getting the WIP to "stick" requires the whole community's participation.

- The responsibility for achieving freshwater objectives and limits has been devolved to the sub-catchment or FMU level, so people who are living within an FMU will need to work together to meet the objectives and limits
- An FMU implementation framework will need to be developed so that there is a mechanism for people to work together to ensure that limits within FMUs are met. This could involve the forming of FMU catchment groups who develop their own sub-catchment plans for managing within limits in their FMUs. Catchment implementation groups are a key component of implementing the whaitua policy framework. They are fundamental in achieving environmental outcomes, but also contribute significantly to social and economic outcomes

The involvement of iwi partners is critical in the development of the FMU implementation framework and implementation programme. Mana whenua hapū/marae input will be integral in freshwater management at an FMU scale (local people in local areas), in order to achieve the freshwater objectives and limits.

Recommendation 6

In order to see the effective implementation of all the objectives, limits and policy packages described in this WIP, the Committee supports:

- A programme of actions where rural and urban catchments have a collective responsibility to make change and improve water quality
- A mainly non-regulatory approach to staying within discharge limits for diffuse contaminants
- An emphasis on the use of integrated planning tools (sub-catchment groups, farm planning tools and user groups), supported by education and incentives
- Regulation of point-source discharges of contaminants, land use activities and water takes
- Seeking means for promoting and ensuring continuous improvement and innovation across all sectors and communities
- Collecting and making available information on resource use in the whaitua as a way of enabling better decision-making at all scales.

Recommendation 7

Greater Wellington, along with iwi and other partners, develops a coherent FMU implementation framework that results in effective and successful managing to limits at an FMU scale, in both rural and urban environments, to achieve freshwater objectives.

Recommendation 8

Greater Wellington resources the Freshwater Management Unit Implementation Framework sufficiently to support the development of an implementation work programme.

Recommendation 9

Greater Wellington ensures that, in preparing the Ruamāhanga whaitua plan change to the PNRP, it works with communities and the Ruamāhanga Whaitua Committee to ensure that the NPS-FM is appropriately given effect to, including in accordance with the freshwater objectives approach described in NPS-FM Policy CA2 and recognition of the 2017 amendments to the NPS-FM in relation to Te Mana o te Wai (NPS-FM Objective AA1) and mātauranga Māori.

5.3 Promoting innovation

Change is imperative in order to achieve a healthy, vibrant future for Wairarapa. In seeking a different way to manage the land and water of the Ruamāhanga whaitua, the Committee has been clear that there needs to be a culture of innovation and changing practice, backed up by institutional structures and operations that support innovation.

Innovation is defined as looking for opportunities beyond tradition or identifying a new or untested approach. It often involves questioning rules, routines and assumptions. Innovation depends on both individual creativity and organisational culture. It can be construed as thinking outside the box.

For innovation to succeed, a number of prerequisites must occur:

- We must establish a clear sense of direction
- Tolerating a certain degree of failure as a necessary part of growth is an important part of encouraging innovation. Innovation is a risk
- Leaders of organisations that sustain innovation offer multiple opportunities for communication. In catchment leadership, communicating the catchment needs or performance on a regular basis allows individuals and entities to ascertain if change is required
- Processes within Greater Wellington need to reflect the desire to support innovation. These may include internally rewarding "bright ideas" and establishing/fostering internal practices that support and reward innovation

The Committee recognises that reviewing the progress of the implementation of the WIP and the activities driven by it provides opportunities to bring new knowledge into how Greater Wellington operates and how the community learns. Reviews of operational practice also provide opportunities to help shape future research and direction.

Recommendation 10

Innovation in land and water management practice in the Ruamāhanga whaitua should be encouraged and actively facilitated by Greater Wellington, including by:

- Including a policy in the Ruamāhanga whaitua chapter of the PNRP, to be considered in resource consent processes, that recognises the value of innovative practice in the achievement of the objectives of the Ruamāhanga whaitua
- Avoiding resource consent conditions that would prevent trialling of alternative management approaches where change and future proofing are known drivers, while also recognising the need to mitigate risk
- Taking opportunities for ongoing plan changes to provide for innovative practice
- Actively reviewing the effectiveness of the implementation of Greater Wellington operational activities and planning practices and of the recommendations in this WIP in order to promote continued improvement and learning, and to ease bottlenecks
- Ensuring that management processes within Greater Wellington reflect a desire to support innovation. This may include internally rewarding "bright ideas" and establishing/fostering internal practices that support and reward innovation.

5.4 Seeking good management practice across sectors and activities

In the Ruamāhanga catchment there is wide scope for better practices to be adopted. What constitutes GMP varies with different land uses, soil types and climatic zones, and is constantly evolving, allowing for continuous improvement. GMP is the practices, procedures or tools that are effective in achieving the desired performance, while providing for desired environmental outcomes. An example of GMP is introducing technology such as precision agriculture to apply nutrients more efficiently. In this context GMP relates to achieving water quality and habitat outcomes, and water use efficiency.

The adoption of GMP applies equally to the operations of territorial authorities and Greater Wellington.

Recommendation 11

The Committee recommends that:

- GMP be emphasised and innovation fostered as part of every farm plan and by the operational practices of Greater Wellington and territorial authorities in the Ruamāhanga whaitua
- Industry guidelines are the primary source of GMP guidance
- Sub-catchment groups, communities and industry bodies help to develop and apply appropriate GMP specific to the identified requirements of FMUs
- All sectors, including the three waters sector, actively design and progressively implement GMP, not just the primary sector
- As Greater Wellington cannot implement GMP on its own, it develops partnerships with industry, stakeholders and communities for supporting the implementation and adoption of GMP, with the critical role of industry recognised.

5.5 Improving the efficient use of water in an increasingly water-constrained environment

The management of water use in the whaitua already includes efficiency measures, but the Committee considers that there are significant benefits in becoming more efficient. In fully allocated catchments, using water more efficiently means water can be freed up and made available to users who would otherwise have no access. Being able to free up water is a reason for efficient use being so important, and it is now specifically directed by the Regional Policy Statement for the Wellington Region and the NPS-FM.

The Committee also recognises that "efficiency" has a meaning that is more complex than is expressed in the PNRP, and believes it should be broadened to also recognise the productive use of water (e.g. recognising efficiency in terms of financial returns on water use volumes). The Committee further recognises that highly efficient water use systems may also require significant trade-offs of other values, and avoiding such trade-offs may be preferable to the use of the most efficient systems. For instance, while irrigation guns are not particularly efficient, their use can mean that rural landscapes can be more diverse and riparian planting can be maintained, as their operation does not require the landscape scale removal of vegetation that pivot irrigation systems may.

Similarly, the water races of Wairarapa are very inefficient from the perspective of losses to groundwater and evaporation. However, their leakiness to groundwater has benefits for local groundwater users and to puna/freshwater springs. In this sense, an analysis of the efficiency of a system needs to sometimes be nuanced by allowing for recognition of the value of less efficient systems. Careful analysis is needed to determine the appropriateness of such systems in a water-constrained environment.

Recommendation 12

The Committee recommends that water use efficiency be improved among all water users in the Ruamāhanga whaitua, including by:

- Local councils (as suppliers of water) improving water conservation by residential, commercial and industrial users, establishing appropriate demand management strategies during water shortages, improving resilience and reducing demand in issuing of consents for new builds and subdivisions, and investigating opportunities for water re-use
- Group and community water suppliers appropriately managing demand during water shortages and supporting improved resilience of supply
- Irrigation users meeting at least 80% efficiency of application and further improving practices through recognised programmes
- Greater Wellington recognising that exceptions to the "80% efficiency of application" requirement may be appropriate where the financial return from a less efficient water application can be shown to be high (i.e. the water use is highly economically efficient) or where there are meaningful benefits for the environment in a less efficient water use, effectively offsetting the benefits of being 80% efficient
- Greater Wellington and territorial authorities working together to develop long term plans for the management of water races in the Ruamāhanga whaitua that meet the objectives of this WIP and provide for the values of the water bodies and communities
- Increasing education opportunities across types of water users.

5.6 Being equitable across the community

The Committee has expressed that as a Ruamāhanga community we are responsible for the state of land and water management as it currently stands, and that the whole community and its institutions are part of the solution to achieve a glistening waters future.

Recommendation 13

All people of the whaitua need to be involved in efforts to ensure that water is used efficiently and with care, and the burden of change in order to improve water quality should be borne across communities.

5.7 Improving how we monitor, account for resource use and review progress

The Committee has identified monitoring and the use of good data as key components of the implementation of this WIP. Monitoring covers the state of rivers and lakes, and hence the achievement of freshwater objectives. Resource use monitoring is also required to show that limits (both take and discharge limits) are being met. Some land use data is useful to indicate whether actions (mitigations) on the land are making a difference (e.g. riparian planting information). The Committee has identified the need to collect more information to improve understanding and enable more informed decision making in the future.

The collection of better contaminant information will help better inform future limit-setting processes and provide greater transparency for the community on what is happening in the catchment. It will also help individuals to understand how what they do on their properties relates to the ability of a sub-catchment to operate within the discharge limit. The collection of resource use information will be vital when reviewing the effectiveness of the policy regime and in making necessary adjustments, including the consideration of things like whether a nutrient allocation regime should be implemented in 10 years' time.

The NPS-FM requires Greater Wellington to monitor each FMU and have a monitoring plan that outlines how it will do this (Policy CB1 of the NPS-FM). The NPS-FM also requires Greater Wellington to establish methods for responding to monitoring that indicates freshwater objectives will not be met.

It is important to make all information easily accessible (required by the NPS-FM to be public) for use by individuals and the community, to enable them to make better management decisions, determine priorities at a range of scales, and ensure regulatory compliance where this is necessary.

The Committee's approach to managing contaminants is largely non-regulatory and focuses on community responsibility and working together to achieve change. As part of this approach, monitoring is likely to be undertaken by individuals or groups within the catchment (citizen science). People may want to monitor for a number of reasons, e.g. catchment communities may want to collect information to assess the effectiveness of their actions. Hapū and marae will develop their own indicators for health (as detailed in Recommendation 1). These indicators will be used to report on progress towards meeting freshwater objectives.

A monitoring regime should include more than environmental indicators. Measuring the effectiveness of policies and actions requires the use of social and economic indicators to get a full picture of impacts (both positive and negative). An analyses of policy effectiveness is fundamental to any review. Changes to policy can then be made. A first step in this process is identifying appropriate indicators and including them in the monitoring plan.

Greater Wellington is also required by Policy CC1 of the NPS-FM to establish and operate a freshwater accounting system at a level of detail in line with the issues of each FMU. To operate an appropriate accounting system, contaminant information and water use data will need to be collected to the smallest scale practical, e.g. sediment data can be collected down to an FMU scale, while nutrient discharge data could be collected at a smaller scale. Water use data is required to be collected at an individual resource consent scale. Greater Wellington has some way to go to establish this system. It requires resourcing and urgent action; it is a key tool for implementation that must be put in place as soon as possible.

It is good policy practice to review continually the effectiveness of the land and water management system, and to report on the pathway to achieving freshwater objectives. Where policies are shown to be ineffective or where there have been unintended consequences, these need to be changed. If they are significant, changes should be made at the first plan change opportunity, or alternatively at the next plan review, which will be 10 years post the plan being operative.

Recommendation 14

Greater Wellington establishes as an urgent priority, and actions, a monitoring plan as required by Policy CB1 of the NPS-FM for the monitoring of each FMU.

Recommendation 15

Greater Wellington establishes as an urgent priority, and operates, a freshwater quality accounting system as required by the NPS-FM (Policy CC1). The existing water take accounting system should be upgraded so that it is compatible with the quality system and is accessible to the public and water users.

Recommendation 16

Greater Wellington requires the provision of information on contaminant inputs, sources and/or losses and mitigation activities from resource users, as appropriate to the issues, suitable for the development, operation and use of fit for purpose freshwater accounting.

Recommendation 17

Greater Wellington develops a suitable monitoring programme(s) to establish in-river sediment loads and/or concentrations, including confirming relationships to sediment loads off land and the effectiveness of mitigations. Greater Wellington requires the progress of actions to mitigate sediment loss, including riparian planting and hill-slope erosion practices, to be regularly reported.

Recommendation 18

Greater Wellington establishes a data protocol and reporting plan to ensure that all aggregated data collected is publicly available and provided in a fit for purpose and transparent manner.

Recommendation 19

Greater Wellington supports community monitoring and the wider integration of monitoring results to support FMU outcomes.

Recommendation 20

Greater Wellington undertakes a review of flow monitoring sites in the Ruamāhanga whaitua. Where necessary, to ensure that the network is fit for purpose in implementing this WIP, it makes changes to the network, including the establishment of new sites.

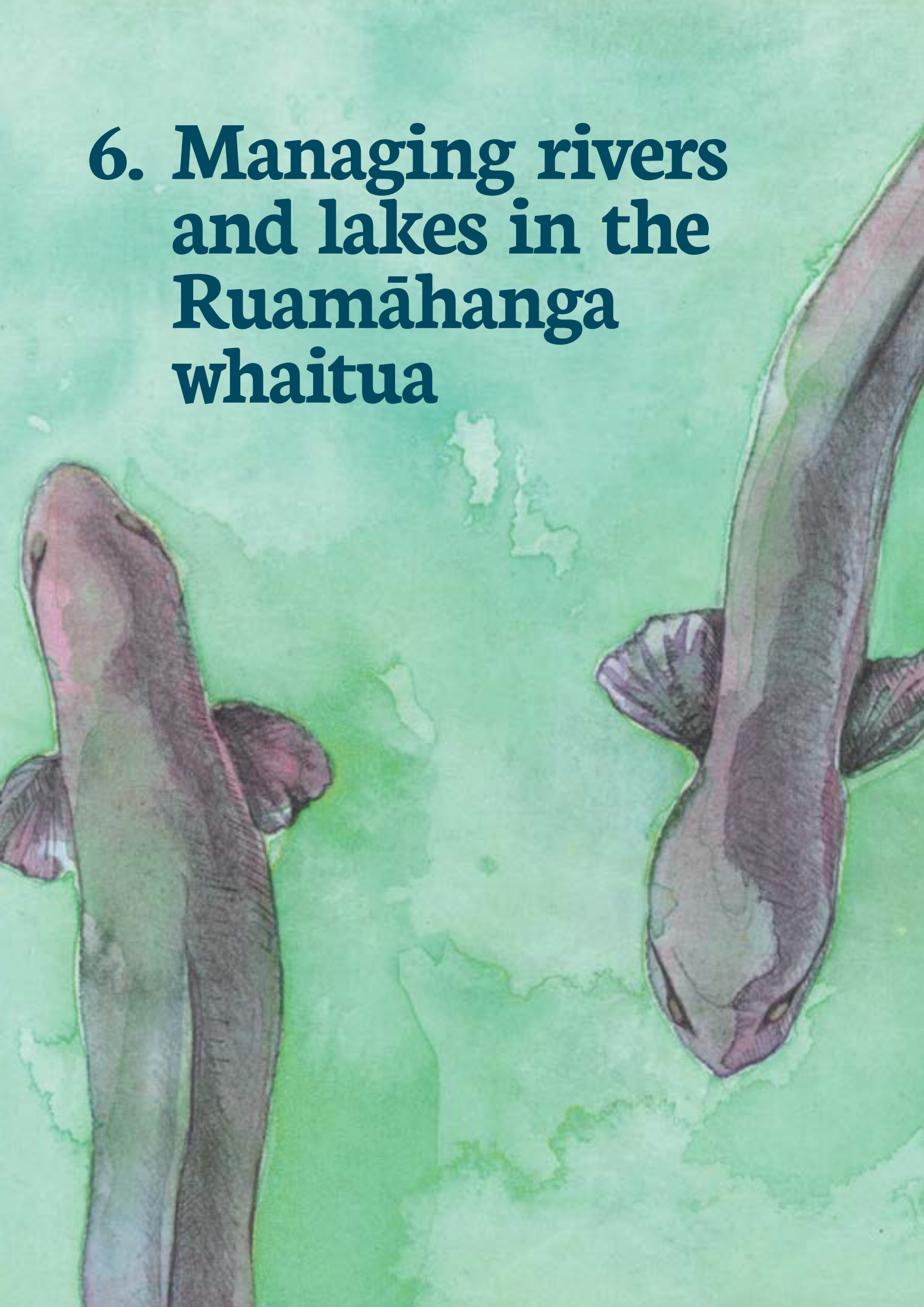
Recommendation 21

Greater Wellington establishes a social and economic monitoring and assessment framework with indicators agreed by the community. Greater Wellington includes social and economic monitoring in the monitoring plan for the Ruamāhanga whaitua.

Recommendation 22

Greater Wellington undertakes a full review of the land and water management system at the next regional plan review (10 years) and makes appropriate changes to the plan.

6. Managing rivers and lakes in the Ruamāhanga whaitua



6 Managing rivers and lakes in the Ruamāhanga whaitua

6.1 Background – key issues and drivers

The physical habitat of rivers, streams, lakes and their margins is important in determining the way ecosystems function and how the relationships between people and water bodies flourish.

This chapter outlines recommendations relating to how activities in and around the rivers and lakes of the Ruamāhanga whaitua should be managed to improve their health. This includes giving consideration to riparian margins, wetlands, river form, natural character, fish passage and habitat, as well as recognising the role of the management of contaminants and the abstraction of water in river and lake health, recommendations on which are found in Chapters 7 and 8.

The Committee's recommendations in this chapter are a critical part of meeting the Ruamāhanga freshwater objectives identified in Chapter 4. This chapter outlines the changes to high level policy, policy for consent processing, research, investment and implementation methods that are needed to deliver on these and the integrated water management story of the Ruamāhanga WIP.

Current state of our rivers, streams and lakes

The health of rivers and streams across the Ruamāhanga whaitua is mixed, from usually very good states in the fast flowing rivers of the bush-clad Tararua hills, to sometimes quite poor states in the streams and rivers that run from the east and across the valley floor. As set out in Table 5 in Appendix 1, the current state of most river FMUs is below the community's and the Committee's expectations, and sometimes below national bottom lines. In particular, a number of water bodies fall below the *E. coli* national bottom lines and are currently not suitable for recreation – these include the Ruamāhanga River in two locations, the Kopuaranga, Whangaehu and Tauanui Rivers, and the Parkvale, Otukura and Mangatarere Streams. In other water bodies, the national bottom line for periphyton is not met.

From a broader ecological perspective than just the attributes in the NOF, the Committee has also set objectives to improve macroinvertebrate community health and indigenous fish and mahinga kai values (see section 4.2.2). Across the whaitua, the health of macroinvertebrate communities is somewhat diminished, with most river FMUs currently falling into the "fair" state, below the Committee's objective for most water bodies to be in a "good" state (see Table 5).

The two major lakes of the whaitua, Lake Wairarapa and Lake Ōnoke, can be described as currently being in a poor or mixed state from an ecosystem health perspective (see Table 6 in Appendix 1). In particular, Lake Wairarapa's health is in general very poor, being defined as supertrophic and having very poor macrophyte cover, and being below the NPS-FM national bottom lines for phytoplankton and total phosphorus.

Both lakes have been affected for a long period of time, and continue to be affected, by a range of land use, drainage, engineered management and in-river activities. Flood management and drainage activities around the lakes and Ruamāhanga River in the lower valley are brought together under the Lower Wairarapa Valley Development Scheme, founded in 1960 and operated by the Greater Wellington Flood Protection department. They include major pumped and gravity fed drainage systems, the operation of the lake level gates at the southern end of Lake Wairarapa and the mechanical opening of the mouth of Lake Ōnoke. These activities have led to the extent of the lakes and wetlands being significantly reduced, the disconnection of the Ruamāhanga River from Lake Wairarapa, and lake levels being artificially managed for the purposes of maintaining flood protection for farms and communities. Modelling for the Committee has suggested that improving the health of the lakes is likely only possible through a combined approach of reducing the contaminants reaching the lakes and changing the hydrodynamics (e.g. the mixing, depth and flow) of the lakes.[12]

12 http://www.gw.govt.nz/assets/Ruamahanga-Whaitua/A-coupled-hydrodynamic-ecological-model-to-test-management-options-for-restoration-of-lakes-Onoke-and-Wairarapa.pdf

The wider complex of lakes and the wetlands surrounding them – Wairarapa Moana – are the remnants of what was once a much larger wetland and lake complex that extended over much of the lower Ruamāhanga valley. While the health of Wairarapa Moana is compromised, the lakes and their surrounds are still highly valued for their indigenous fish values (including for kākahi, New Zealand's freshwater mussel), native bird values and cultural and recreational uses. In particular, the lake and wetland margins are highly valued for their bird habitat, including of native and migratory birds (as recognised in the WCO, discussed below) and for providing shelter for gamebird species. The Committee notes the current application with the Department of Conservation to make Wairarapa Moana a Ramsar wetland of international importance.

National Water Conservation (Lake Wairarapa) Order 1989

The WCO for Lake Wairarapa, issued in 1989 under the Water and Soil Conservation Act 1967, recognises the outstanding wildlife habitat of the lake, particularly on the eastern shoreline, created in part as a consequence of the natural fluctuations in water levels.[13] While the WCO does not define or qualify what wildlife habitat means, the application for the WCO identified the lake and its wetted margins as habitat for birds, and particularly for migrant wading birds, of both national and international significance.[14] The WCO prevents any water rights or authorisations being granted that would "diminish significantly the outstanding wildlife habitat features of any part of the lake" (section 5(1)). The purposes for which a WCO could be issued did not include mana whenua values until 1991, with the carrying over of these powers to section 199 of the RMA; consequently mana whenua values are not included in the current Lake Wairarapa WCO.

Minimum lake levels (including responding to seasonal fluctuations) designed to provide for the WCO are set out in the operative and proposed regional plans. These determine the levels to which resource consent to use the lake level gates must operate within. Resource consents to dam and divert water through the operation of the lake level gates are held by Greater Wellington and operated by the Greater Wellington Flood Protection department. These resource consents, last issued in 1999, expire in February 2019.

Mana whenua relationships

Te Awa Tapu o Ruamāhanga (the sacred Ruamāhanga) and Wairarapa Moana are considered taonga by Ngāti Kahungunu ki Wairarapa and Rangitāne ō Wairarapa. As described in Schedule B, Ngā Taonga Nui a Kiwa of the PNRP, te hā o te ora (the breath of life) was placed in the river at the beginning of time and it "remains a pantry, chemist and encyclopaedia to be utilised for sustenance and knowledge transmission".[15] For the people of the papa kāinga, marae and hapū in the Ruamāhanga valley, the rivers, streams, wetlands, puna and lakes provide valued and important places for cultural use, the collection of mahinga kai and recreation. Once home to a great tuna fishery, Wairarapa Moana's mahinga kai values have been diminished in the past two centuries, although it remains a greatly valued place for marae and individuals to visit for cultural, recreational, environmental and commercial reasons.

The recent Treaty settlement between the Crown and Ngāti Kahungunu ki Wairarapa Tāmaki Nui-ā-Rua[16] and the 2016 deed of settlement between the Crown and Rangitāne ō Wairarapa[17] will initiate the creation of the Wairarapa Moana Statutory Board. This Board, comprising five mana whenua members and five members from central and local government, will be a guardian of Wairarapa Moana and the Ruamāhanga catchment, for the benefit of present and future generations.

The Board will play a crucial and integrating role in the future management of the lakes, the lake margins and the catchment. The Board's powers include the ability to establish a sub-committee to create and recommend to the Board a natural resources document to identify the vision and outcomes for Wairarapa Moana and the Ruamāhanga catchment. In future, Greater Wellington must recognise and provide for the content of the natural resources document in RMA plans, and give particular regard to the document in the preparation of annual and long term plans. The Board will also have the ability to determine the operational management of the Wairarapa Moana reserves.

13 http://www.legislation.govt.nz/regulation/public/1989/0051/latest/DLM129375.html

14 http://www.mfe.govt.nz/sites/default/files/media/Lake%20Wairarapa%20WCO%20application.pdf

15 http://www.gw.govt.nz/assets/Plans--Publications/Regional-Plan-Review/Proposed-Plan/Chapter-12-Schedules_2.pdf

16 https://www.govt.nz/dmsdocument/6424.pdf

17 https://www.govt.nz/dmsdocument/6556

Mana whenua and community feedback

Mana whenua wish to see their values reflected in all parts of the WIP, including the management of rivers and lakes. Mana whenua have been clear that their values will not have been protected in full if timeframes for improvements in the health of the rivers and lakes stretch out to 2080, and they wish to see an acceleration of the timeframes for improvement. Throughout their engagement with the Committee, mana whenua have signalled strong support for increased riparian planting on all water bodies, increased wetland restoration and a renewed approach to river management that focuses on managing the river for the river.

The Committee's engagement with the whaitua community included asking people to indicate their preferred management approaches to improving natural character in rivers and lakes, while recognising the role of flood protection activities in protecting people and assets. Very strong support was indicated for improved floodplain planning, a process that aims to align strategic and operational planning and works with the outcomes the community wishes to see for their rivers. This engagement also indicated strong support for planting floodplain areas, riparian planting and the use of wetlands to improve habitat.

Under the current regional plans, the majority of the area of Lake Ōnoke is considered part of the coastal marine area. This means that the New Zealand Coastal Policy Statement also plays an important role in the management of the lake, as decisions in the WIP and any changes to the PNRP must give effect to the Coastal Policy Statement. Directions in the Statement to consider include the need to: recognise the role of tangata whenua as kaitiaki, including incorporating mātauranga Māori into sustainable resource management; restore water quality where it currently compromises use and ecosystem health; and ensure that land use activities are managed in relation to their impacts on coastal sedimentation.[18]

Habitat of trout and salmon

Under section 7(h) of the RMA, regional plans are required to have particular regard to the protection of the habitat of trout and salmon. There are no salmon in the Ruamāhanga whaitua, therefore a consideration of section 7(h) here relates only to trout. Objective O25 in the PNRP to maintain and improve trout fishery and spawning values, and the subsequent methods to achieve this objective (e.g. the stock exclusion rule applying to water bodies with identified trout fishery and spawning habitat [Schedule I] and permitted activity requirements around managing effects during spawning periods) are considered to provide appropriately for trout fishery values in the whaitua. Further, the water quality and quantity objectives recommended in this WIP, and the policy packages to deliver them, will provide for ecosystem health values across freshwater environments in the whaitua. As such no further changes to the provision of trout habitat protection are recommended in the WIP.

6.2 Objectives for healthy rivers and lakes

The rivers and lakes management policy package recognises that the achievement of freshwater objectives is dependent on the health of a water body being addressed as a whole. This package, the flows and water allocation and discharges and land use packages knit together to provide for the achievement of the Ruamāhanga freshwater objectives.

The Ruamāhanga whaitua modelling outputs indicate that improving habitat in rivers and lakes is critical to achieving some water quality objectives. Improving water quality alone without improving habitat will often not improve ecological health. The Committee has learned that an improved and more integrated management of the habitat of streams, rivers and lakes will be necessary to achieve the whaitua objectives for periphyton, MCI and lake health and to reduce sediment loads in all FMUs in the whaitua.

The Committee has identified nine river FMUs where improvements are required for periphyton outcomes and 13 river FMUs where improvements are required for MCI outcomes. For both sets of objectives, the rivers and lakes management package and its implementation will be crucial to their achievement.

The specific Ruamāhanga freshwater objectives for which the rivers and lakes policy package is most important are:

1 Sediment – information from modelling shows that approximately 20% of the fine sediment loads moving through the catchment each year is coming from the erosion of stream, river and lake beds and banks. Sediment affects a range of ecosystem health, cultural and human use values. Locking up this sediment by managing the banks and beds (e.g. through riparian planting) will be a major contributor to reducing sediment loads to meet the targets identified in section 7.3.3

18 https://www.doc.govt.nz/Documents/conservation/marine-and-coastal/coastal-management/nz-coastal-policy-statement-2010.pdf

2 Macroinvertebrate community index (MCI) – a modelling of the impacts of the different scenarios on the MCI shows how important habitat disturbance and suspended and deposited sediment are to MCI outcomes, even when other water quality attributes are very good. For example, the Waiōhine River has very good water quality, but MCI outcomes are at the very bottom of the 'fair' band

3 Periphyton – shading of water bodies is necessary to help achieve the Ruamāhanga whaitua periphyton objectives identified in section 4.4, as these objectives will not be achieved through nutrient reductions alone. Increasingly, evidence is suggesting that managing temperature and sunlight incidence in rivers and streams is a driving parameter in periphyton growth, alongside excessive nutrients[19]

4 Indigenous fish and mahinga kai – in combination with the implementation activities to achieve improvements for sediment, MCI and periphyton outcomes, restoring in-river and in-lake habitat is necessary for the achievement of the Committee's objectives for indigenous fish and mahinga kai.

6.2.1 Te Ara Wai – caring for the path of the water

The Committee has clearly stated that they wish to see a significant change in how rivers and lakes are managed in the Ruamāhanga whaitua, with the focus becoming the health and vitality of the water bodies themselves driving the way activities are managed. This focus on the mauri and values of the water bodies themselves needs to influence the way that the entire whaitua community and the institutions acting for that community think about investing time, money and effort in river and lake management. The Committee wishes to see "river management" that actively enhances water attenuation and aquifer recharge across the whaitua, and the achievement of periphyton, MCI, native fish and other freshwater objectives.

6.2.2 Healthy rivers and lakes

Te Hauora o te Wai, the health of the water body itself, is an element of Te Mana o te Wai that is critical to the management of rivers and lakes. While work to improve water often focuses on contaminants or water levels, the integrity of the water body – its bed, banks and vegetation – is sometimes less visible. The opportunity exists for the WIP to give visibility and prominence to this aspect of Te Mana o te Wai, reflecting how mana whenua and the broader whaitua community express their value of the life force of water and water bodies and of the way that the integrity and health of the water body speaks of the integrity and health of the broader environment and community.

The Committee has heard strong feedback from mana whenua and the whaitua community that improved riparian management, integrated water storage and looking after wetlands and lakes are all crucial to providing for the way people value water in the Ruamāhanga whaitua.

Greater Wellington plays a significant role in how healthy rivers and lakes may be achieved in the Ruamāhanga whaitua. It spends significant energy, time and resources in managing flood risk and soil erosion, particularly in the Ruamāhanga whaitua. As an integrated land, water and people management plan for the future of the Ruamāhanga whaitua, this WIP sets out how Greater Wellington should align activities we undertake in rivers and lakes, and their catchments. In this way Greater Wellington activities can deliver and enhance the objectives, key policies and vision of the Committee and whaitua community. This will be achieved through both changes to the PNRP and changes to the way Greater Wellington plans, funds and delivers catchment management activities in accordance with the Ruamāhanga whaitua outcomes.

19 http://www.gw.govt.nz/assets/Ruamahanga-Whaitua/Setting-nutrient-criteria-to-achieve-desired-periphyton-attribute-states-in-Ruamhanga-Whaitua-January-2018.pdf

Recommendation 23

Greater Wellington includes in the PNRP a policy or policies that identifies that "river and lake management" is for the health of the water body itself, recognising:

1. That the mauri of the water sustains the mauri of the people
2. The critical importance of providing for the habitat and natural character of rivers and lakes in achieving the Ruamāhanga freshwater objectives
3. The extensiveness and importance of small streams, wetlands and backwaters (in braided rivers) in the Ruamāhanga whaitua in providing healthy indigenous fish habitat and bird habitat and the conditions for mahinga kai species, places and activities to thrive.

Recommendation 24

Greater Wellington includes in the PNRP an overarching policy to improve, across the Ruamāhanga whaitua, riparian vegetation of streams, rivers and lakes for erosion and sediment control, bank stabilisation, temperature management (via shading) and control of algae, and to support other ecosystem health, mahinga kai and indigenous biodiversity outcomes.

Recommendation 25

Greater Wellington plans and implements the Committee's vision for healthy rivers and lakes in the Ruamāhanga whaitua by:

1. Ensuring that the river and lake management functions of Greater Wellington achieve freshwater objectives and targets in each FMU
2. Working with mana whenua and communities in co-creating what river and lake management for the health of the river looks like within each FMU.

6.2.3 Slowing water down

The Committee supports an integrated, catchment-wide approach to managing the water bodies of the Ruamāhanga whaitua. Such an approach would aim to increase ecological and social health and wellbeing, as well as improve water use reliability and resiliency to the pressures of changing climate. This would bring together multiple management options in the long and short term, rather than a dependency on any one mechanism.

Options for lakes and river management could include attenuation of water in soils, wetlands, lakes and groundwater systems across the catchment. This would improve river base flow and the quality of habitat.

Further discussion and recommendations for attenuation (and other storage mechanisms) can be found in section 8.3.2.

6.2.4 Mana whenua participation in river and lake management

While developing this WIP, the Committee heard clearly from mana whenua that they wish to participate in the regulatory, planning and operational elements of activities in the beds of rivers and lakes to a degree greater than they are currently. Feedback from mana whenua has indicated that they wish to be more involved in consent applications for flood protection and other river works activities, such as the removal of gravel, logs and sand from waterways and activities that disturb the beds of lakes and rivers.

The NPS-FM directs that local authorities should take "reasonable steps" to involve iwi and hapū in freshwater management decision making, including to reflect their values in decision making and to work with iwi and hapū to identify their values and interests.[20] While Greater Wellington has established practices for engagement with iwi authorities in consented activities, including them both as a regulator through consent processing and as a consent applicant through operational activities, consideration is needed of how to further enable participation by papa kāinga, marae and hapū across the Ruamāhanga whaitua. It is noted that the advent of Mana Whakahone ā Rohe relationships in the RMA in 2017 may be a suitable mechanism for this.[21]

Recommendation 26

Greater Wellington identifies and implements methods for further enabling mana whenua participation in land and water resource management, including with papa kāinga, marae and hapū (as appropriate), to ensure that the values of mana whenua are appropriately reflected in freshwater planning and regulatory processes and in flood protection strategic and operational planning and implementation.

6.2.5 Greater Wellington's role in providing for healthy rivers and lakes

Improving the habitat of rivers, lakes and wetlands will be a vital part of achieving the Ruamāhanga whaitua freshwater objectives. For example, enhancing riparian margins will play a role in increasing stream shade and reducing water temperature, which in turn reduces nuisance algae growth. Enhancing natural character could include improving riparian vegetation for bank stabilisation, increasing shading, and improving pool, run and riffle sequences in rivers, thus improving habitat for fish. Emerging tools such as the Habitat Quality Index and Natural Character Index may have a useful role in assessing the suitability of different management approaches in providing for healthy rivers and lakes.

The Committee has recognised that Greater Wellington has a significant role in influencing the way that activities affecting rivers, lakes and wetlands are carried out, in particular through flood protection planning and operational works. This includes managing the gates controlling water levels in Lake Wairarapa and the lower valley drainage scheme. Another example is the Te Kāuru floodplain planning process currently underway, which aims to develop a Floodplain Management Plan (FMP) setting out a long-term strategy for managing flooding and erosion risk in the Upper Ruamāhanga.[22] The Floodplain Management Plan will inform consent applications and operational activities affecting rivers in the Upper Ruamāhanga for the coming decades, as well as identify works to provide for a healthy environment and the funding requirements to do so. Greater Wellington also has a major role in the implementation of activities affecting rivers and lakes, including offering financial support and advice, through land management and resource consenting functions.

The Committee has expressed very clearly that Greater Wellington should review the ways in which it undertakes planning, governance, investment and operational activities affecting the health of rivers, lakes and wetlands. There is concern that current activities and practices are not suitable to deliver on the objectives of this WIP. The Committee strongly recommends that Greater Wellington consider how it might implement innovative approaches and provide leadership to the whaitua community in achieving healthy rivers and lakes.

20 See Section D, NPS-FM 2014 (amended 2017) http://www.mfe.govt.nz/sites/default/files/media/Fresh%20water/nps-freshwater-ameneded-2017_0.pdf

21 http://www.mfe.govt.nz/rma/manawhakahono

22 http://www.gw.govt.nz/assets/Democratic-Services/TKURRFMPS-Approved-Terms-of-Reference-for-2016-19-triennium.pdf

Recommendation 27

Greater Wellington includes in the PNRP a policy promoting the restoration of rivers, lakes and wetlands to achieve the Ruamāhanga freshwater objectives, which supports activities in the beds of rivers, lakes and wetlands when these activities are undertaken for such restoration purposes.[23]

Recommendation 28

Greater Wellington reviews current planning and implementation activities relevant to the health of lakes and rivers in order to:

1. Identify any changes necessary to planning, governance, investment and practice to deliver the Ruamāhanga whaitua objectives through river and lake management
2. Identify new multidisciplinary systems to deliver integrated river and catchment management
3. Progressively implement the findings of this review work.

"Activities" could include institutional delivery structures, the alignment of future relevant land and water programmes and investments, and the application of GMP in operational and capital expenditure works.

Recommendation 29

Greater Wellington seeks and takes opportunities to enhance the natural form and character, aquatic ecosystem health and mahinga kai of rivers, streams, lakes and wetlands across the Ruamāhanga whaitua, including by:

1. Aligning the planning and operation of flood management activities (e.g. floodplain planning) with the Ruamāhanga whaitua objectives and policies
2. Identifying and implementing management options to enhance natural character and to achieve the Ruamāhanga freshwater objectives when undertaking operational works (e.g. willow removal and gravel extraction)
3. Aligning and supporting farm planning and farm plan implementation with the Ruamāhanga whaitua objectives
4. Investing in riparian planting for shading and stream bank erosion management and in wetland restoration[24]
5. Supporting and undertaking the restoration of native fish spawning habitat, including in water bodies affected by flood management activities.

23 Note the connection to Recommendation 9 in relation to consenting processes recognising the value of innovative practice.

24 Note the connection to Recommendation 38 in relation to sediment targets from managing stream bank erosion.

6.3 Methods for river and lake management

6.3.1 Restoring Lake Wairarapa and Lake Ōnoke with an emphasis on "in-lake" methods

For both Lake Ōnoke and Lake Wairarapa, the existing in-lake contaminant loads, changes to hydrodynamics, and contaminant loads entering the lakes all contribute to poor ecosystem health and much diminished mana whenua values. Restoring ecosystem health will likely require improving nutrient levels in the lake, reducing suspended sediment, establishing macrophytes on lake beds, further restoring lake edge wetlands, and reducing sediment loads from the catchment into the lakes. Restoring the connection between the Ruamāhanga River and Lake Wairarapa will be a critical part of restoring the relationship between, and mauri of, both water bodies.

Modelling for the Committee has illustrated that the attributes in Lake Wairarapa below national bottom lines in the NPS-FM (e.g. total phosphorus) are unlikely to shift with reductions in catchment loads alone.[25] In contrast, modelling of the reconnection of the Ruamāhanga River (at low flows) with Lake Wairarapa shows its potential as an effective strategy in reducing the internal nutrient load and improving phytoplankton (trophic state). Modelling to see the impacts of increasing the depth of Lake Wairarapa shows that under conditions of one metre of extra depth, macrophyte re-establishment is possible. The modelling points to the role of in-lake management methods in restoring the health of the lakes alongside reductions in contaminants reaching the lakes from land use activities and discharges.

Recognising the sizable challenge of the existing ecosystem problems with the lakes, and the potentially long timeframes to create change in catchment loads and lake hydrodynamics, the Committee has identified a longer timeframe for achieving the objectives for Lake Wairarapa in particular. This timeframe has been met with some concern for being too long, including by mana whenua. The Committee has acknowledged that it would be preferable to restore the health of the lakes as quickly as possible, and as such recommends that efforts to improve lake health start immediately and be progressively implemented over time.

It is also important to note that the modelling has indicated that improvements to some attributes might come at the detriment of other attributes. For example, improvements in sediment in Lake Wairarapa may also have the potential to increase nuisance phytoplankton growth unless other mitigation options, such as macrophyte re-establishment, are implemented. There is therefore a need to further explore and bundle options for the improvement of the health of the lakes in order to meet the Ruamāhanga whaitua objectives and provide the whaitua values. The Committee has signalled strong interest in ensuring that this recent knowledge is built on as a key part of a commitment to restoring the health of Lake Wairarapa and Lake Ōnoke over time.

25 http://www.gw.govt.nz/assets/Ruamahanga-Whaitua/A-coupled-hydrodynamic-ecological-model-to-test-management-options-for-restoration-of-lakes-Onoke-and-Wairarapa.pdf

Recommendation 30

Greater Wellington includes a policy in the PNRP to restore the health of Wairarapa Moana by 2080, including to provide for mahinga kai, support native fish populations and restore the health of the Wairarapa Moana wetlands.

Recommendation 31

Greater Wellington commits to the restoration of the health of Wairarapa Moana, including Lake Wairarapa and Lake Ōnoke, by undertaking research, investigations and experiments in management approaches, strategic planning and changes to operational activities to progressively improve the lake health and to reach the objectives of this WIP by 2080 at the latest.

Recommendation 32

Greater Wellington undertakes feasibility studies of "in-lake" management options for the purposes of providing for the community values of Wairarapa Moana and achieving the freshwater objectives identified in this WIP. Options to investigate include:

- Rerouting the Ruamāhanga River into Lake Wairarapa, particularly at flows below the median flow, with higher flows bypassing the lake
- Alternative management regimes for the lake level gates at Lake Wairarapa
- Alternative management regimes for Lake Ōnoke, including in relation to the timing, location and operation of lake mouth openings
- Experimenting with alternative management options, such as temporarily holding Lake Wairarapa at higher levels than current practice, as a means of testing proof of concepts for potential broader application.

All such feasibility studies of in-lake management options should be completed within 10 years of the issuing of this WIP (i.e. by 2028). Experimentation should ensure an appropriate consideration of the WCO. Effective and early engagement with the Ruamāhanga whaitua community and broader public as part of any such feasibility work will help to underpin successful experimentation and the robust identification of management choices for future implementation.

6.3.2 Investigations into restoring the health of Lake Wairarapa and Lake Ōnoke

As discussed above, modelling has shown positive signs that changing the hydrodynamics of Lake Wairarapa could be an effective way to improve the health of the lake from its currently very poor state and move towards the vision of glistening waters. Changing the lake's hydrodynamics could include restoring the river flow into the lake, maintaining higher lake levels and having different lake opening regimes.

The Committee recommends a further investigation and implementation of options to improve the lakes' health, including identifying methods to reduce the resuspension of sediments already in the lakes in order to improve clarity and create conditions suitable for macrophytes to survive and thrive. Options could include techniques used elsewhere in New Zealand (e.g. Lake Waihora, Kaituna), mitigation of the impacts of wave action (e.g. the use of shelterbelts on western shores of Lake Wairarapa), restoring macrophytes, wetland restoration and the use of floating wetlands to reduce fetch and remove nutrients. Substantial further investigation should be undertaken to explore these options and the impacts of any such changes, and to identify feasible options for mana whenua and the community to consider further.

The Committee also recognises the extent and value of current research (see the text box) in helping to expand understanding of the history, dynamics and pressures on the two lakes, and recommends that Greater Wellington recognise and support this work by contributing to an investigation into management options for the future of the lakes as well as other implementation processes.

Current lake research projects

Lakes 380

Combining traditional environmental reconstruction techniques and contemporary methods (e.g. environmental DNA and core scanning) to characterise current lake health and explore rates and causes of change over the last 1,000 years.

Lake Wairarapa aquatic plants

Aquatic macrophyte surveys to assess the current quality and extent of the macrophyte community in Lake Wairarapa. Aquatic macrophytes are considered a key indicator of shallow lake health.

Lake Wairarapa sediment/nutrient investigation

An assessment of nutrients bound to lake-bed sediments of Lake Wairarapa to assess their potential availability for phytoplankton growth.

Kākahi monitoring

Ongoing citizen science monitoring of kākahi health at Lake Wairarapa.

Perch egg removal trials

Project to trial the strategic removal of perch eggs as a cost-effective means of supressing perch abundance.

Bird monitoring

Ongoing monitoring of the nationally significant matuku (bittern) population and of the long-term effects of lake level management on lake-edge bird populations.

Restoration studies

Investigation of options to rehabilitate lake-edge wetlands following grazing removal and to restore saltmarsh habitat.

Recommendation 33

Greater Wellington investigates further options for restoring the health of Wairarapa Moana, including restoring the Ruamāhanga River flow into Lake Wairarapa, including to:

- Mitigate the impacts of wave action
- Reduce the re-suspension of sediments in order to improve clarity
- Create conditions suitable for macrophytes to survive and thrive
- Remove nutrients and sediments
- Restore the health of mahinga kai species
- Enhance the health of wetlands.

Recommendation 34

Greater Wellington recognises and supports research being undertaken by external groups, mana whenua and the whaitua community on means to improve the health of Lake Wairarapa and Lake Ōnoke, and actively considers the application of new knowledge to the management of activities affecting the lakes, including through planning, consent practice and operational management practices.

6.3.3 Native and introduced fish management

An integral component of ecosystem health and mahinga kai values is the health and abundance of both native fish and non-native fish in the rivers and lakes of the Ruamāhanga whaitua. Many agencies are involved in the management of freshwater fisheries in New Zealand – the management of native fisheries for commercial purposes is controlled through the quota management system by the Ministry for Primary Industries, the management of non-commercial native fisheries is the responsibility of the Department of Conservation, under the Conservation Act 1987 and Freshwater Fisheries Regulations 1983, and Greater Wellington, through functions under the RMA. Greater Wellington also has functions under the Biosecurity Act 1993 in relation to the management of pests in the region, including being a leader in "activities that prevent, reduce, or eliminate adverse effects from harmful organisms" in the region (section 12B(1)). Finally, the Wellington Fish and Game Council has a role as issuer of licences to take sports fish (e.g. trout, perch), including for the purposes of research.

The Committee has indicated that the management of the commercial native fisheries, such as whitebaiting and tuna harvest, and the management of non-native fish could play a valuable role in the achievement of the whaitua objectives. This is particularly the case for Lake Wairarapa, Lake Ōnoke and rivers such as the Kopuaranga. For example, rudd (designated a noxious fish under the Freshwater Fisheries Regulations 1983) likely contributes to the continued poor health of macrophyte beds in Lake Wairarapa.

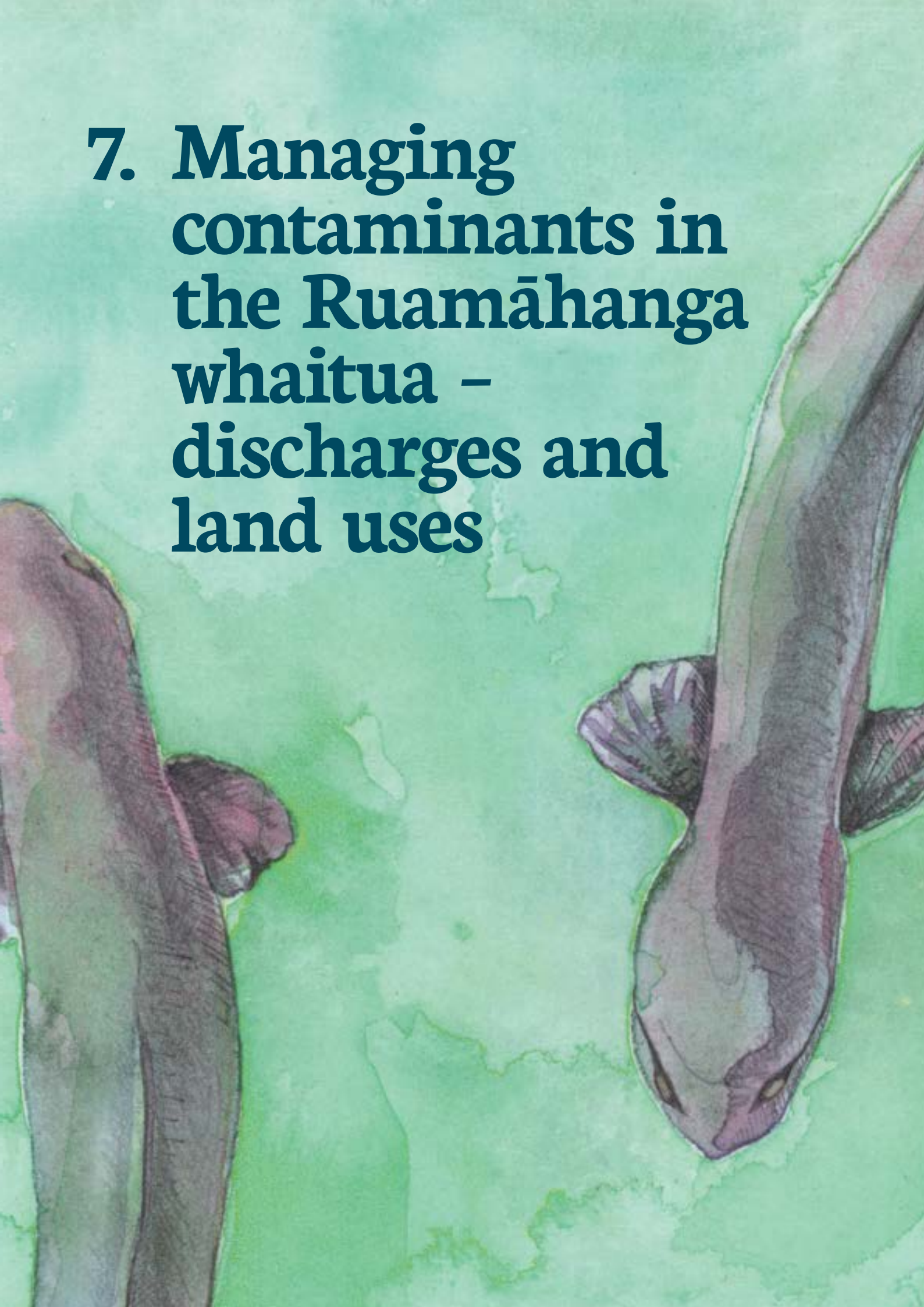
As identified in Greater Wellington's proposed Pest Management Plan, there is a role for Greater Wellington to collaborate with and provide support to the responsible external agencies in exotic species management, including pest fish. There is value in Greater Wellington playing an active role in advocating for connecting with central government agencies in the management of native and non-native freshwater fisheries, including to help deliver on the Ruamāhanga whaitua objectives and connecting with the work of catchment communities across the whaitua.

Recommendation 35

Greater Wellington actively informs and works with external agencies, including the Department of Conservation, to link the management of nonnative fisheries and the commercial harvest of native fish species with achieving the Ruamāhanga whaitua objectives and to deliver on the needs of catchment communities.[26]

26 See also Recommendation 61.

7. Managing contaminants in the Ruamāhanga whaitua – discharges and land uses



7 Managing contaminants in the Ruamāhanga whaitua – discharges and land uses

7.1 Background – key issues and drivers

Rivers, lakes, wetlands and streams within the Ruamāhanga whaitua are highly valued for a number of reasons by the community, including for recreation, mahinga kai and stock water. All can be affected by poor water quality and reduced supply resulting from a range of land use and discharge activities.

The NPS-FM requires water quality to be maintained or improved, and improvements must be made where national bottom lines are not being met. While water quality is very good in some parts of the catchment (e.g. the forested Tararua Range), there is a range of FMUs in the Ruamāhanga whaitua where national bottom lines are not currently met for certain measures. These include rivers that do not meet the definition of "swimmable" as it relates to *E. coli*, such as the Parkvale Stream, and rivers where periphyton is below national bottom lines, such as the Kopuaranga River.

There are significant sediment issues in the Ruamāhanga whaitua, with approximately 1.3 million tonnes of sediment lost from land and moving through the rivers and streams of the whaitua each year. It is estimated that nearly 70% of the sediment reaching Lake Ōnoke each year is generated from land not under native bush. Five FMUs contribute just over 65% of the total annual sediment load coming off "non-native" land – the Taueru, Huangarua, Eastern hill streams, Whangaehu and Kopuaranga. Much of this sediment is negatively affecting the health of Lake Wairarapa, Lake Ōnoke and the South Wairarapa coast.

Both Lake Wairarapa and Lake Ōnoke are in very poor health as a result of being affected by the accumulated effects of contaminants and sediment from the entire Ruamāhanga catchment. Historical changes to the lake and surrounding wetland habitat have also had significant impacts. Both lakes have water quality that does not meet national bottom lines e.g. for phytoplankton or total phosphorus.

The Committee's recommendations in this chapter are a prerequisite to meeting the freshwater objectives identified in section 4.4. This chapter emphasises that it is both how we manage land and the contaminants that we discharge in the catchment that directly affect our water quality. The recommendations include a mix of regulatory and non-regulatory approaches to managing land and the discharge of contaminants.

7.2 Objectives for managing contaminants

The discharges and land use policy package to manage contaminants recognises that the achievement of freshwater objectives for water quality, periphyton, MCI and fish is dependent on reducing the amount of contaminants reaching our waterways. Some management actions will also contribute to the achievement of habitat objectives e.g. riparian planting.

7.3 Water quality limits

Policy A1 of the NPS-FM requires freshwater quality limits to be set for all FMUs to give effect to the objectives in the NPS-FM and specifically to achieve the freshwater objectives identified in this WIP.

In the Ruamāhanga whaitua, load limits and targets will be set for nitrogen, phosphorus and sediment, and concentration limits and targets will be set for *E. coli*. "Limits" are defined as the current load or concentration, and "targets" as the load or concentration to be reached in the future in order to meet the freshwater objectives. This recognises the need to maintain or improve freshwater quality as directed by the NPS-FM and responds to the definitions provided in that higher level policy document. For the purposes of a Ruamāhanga whaitua plan change to implement the regulatory elements of this WIP, targets should be expressed as percentage reductions from the limit to allow for increased understanding of water quality through time (e.g. through progressive improvements made to models). Sections 7.3.1, 7.3.2 and 7.3.3 provide the tables of limits and targets for each contaminant in each FMU in the Ruamāhanga whaitua.

Other contaminants such as zinc, copper and hydrocarbons that are not such a problem for the Ruamāhanga whaitua will not have limits set at an FMU scale. These contaminants will instead be managed through the methods used to manage other contaminants and through the application of GMP, such as stormwater management.

The NPS-FM also requires that over-allocation – where an objective or limit is currently not being met – be avoided (Policy A1). The work of the Committee has established that a number of water bodies do not currently meet their objectives and, in some cases, do not meet national bottom lines under the NPS-FM NOF. Where discharges and land use activities contribute to those objectives not being met, this policy package outlines methods to reduce overallocation over time.

Recommendation 36

Greater Wellington sets water quality limits and targets for nutrients and sediment loads as rules in the PNRP for each FMU within the Ruamāhanga whaitua, in accordance with Tables 2 and 3. Targets should be expressed as percentage reductions (from the limits) in the Ruamāhanga whaitua plan change.

Recommendation 37

Greater Wellington sets water quality limits and targets for *E. coli* concentrations as rules in the PNRP for each FMU within the Ruamāhanga whaitua, in accordance with the four attribute states in Table 8 in Appendix 3.

7.3.1 Limits and targets for nutrients from diffuse source discharges

Reducing nutrient loads is important to safeguard life-supporting capacity, ecosystem processes and indigenous species. Nutrients also play a role in the growth of periphyton, of which levels are too high in many rivers in the catchment.

Based on the Committee's objectives identified in section 4.3, limits on the annual amount of nutrients to reach water from diffuse sources (i.e. leached through soil and into groundwater) have been identified for each river FMU in Table 2. The table describes both the current load (the "limit") and the load to be reached in the future (the "target") in order to meet the Ruamāhanga whaitua objectives by 2040 (note that some timeframes are longer).

The current loads (the "limits") were calculated by combining the leaching loads associated with land use activities in the catchment and the direct inputs from the five wastewater treatment plants (in the four FMUs where this is relevant).

The targets were calculated using the same method of combining leaching loads and wastewater treatment plant discharges, and were based on the freshwater objectives. The target loads for the wastewater treatment plants were based on the Silver 2040 scenario, which anticipates all wastewater treatment plant discharges to land by 2040, with the exception of discharges directly to water only under unusual circumstances and when rivers are in very high flow. Leaching loads were calculated using the Overseer scenario map relevant to each FMU to achieve the freshwater objective e.g. the Taueru River scenario is Silver 2040, so the Overseer Silver 2040 leaching map was used.[27] The load reductions to be achieved by 2040 are variable, and hence imply a priority for effort.

27 More information on the methodology can be found in the Jacobs report: http://www.gw.govt.nz/assets/Ruamahanga-Whaitua/Ruamhanga-Catchment-Modelling-Water-quality-freshwater-objectives-and-load-setting-August-2018.pdf.

Table 2. Nutrient limits and targets for diffuse sources of nitrogen and phosphorus in the Ruamāhanga whaitua, to be achieved by 2040

Interpretation

"Limit" = current load
Loads are un-attenuated
t/yr = tonnes per year

River freshwater management unit	Nitrate (NO3-N)			Total phosphorus (TP)		
	Limit load (t/yr)	Target load (t/yr)	% load reduction	Limit load (t/yr)	Target load (t/yr)	% load reduction
Eastern hill streams	484	479	1	18.6	16.4	11
Huangarua River	406	403	1	26.6	24.7	7
Kopuaranga River	339	298	12	38.2	9.5	75
Makahakaha Stream	80	71	11	3.5	1.9	47
Mangatarere Stream	324	289	11	17.8	11.5	35
Otukura Stream	267	216	19	6.7	4.2	38
Parkvale Stream	251	217	13	9.2	6.2	33
South coast streams	202	201	1	8.4	7.9	6
Tauanui River	66	63	5	2.3	1.5	33
Taueru River	443	393	11	18.5	8.2	56
Tauherenīkau River	102	101	0.3	5.4	5.3	2
Tūranganui River	85	83	2	3.1	2.8	10
Upper Ruamāhanga River	101	101	0	8.2	8.0	1
Valley floor streams (to Lake Wairarapa)	275	205	26	11.4	5.0	56
Valley floor streams (to Ruamāhanga River)	379	334	12	15.1	11.5	24
Waingawa River	124	124	1	8.1	8.0	1
Waiōhine River	122	121	1	9.0	8.6	5
Waipoua River	348	317	9	25.5	9.3	64
Western lakes streams	227	224	2	26.1	25.4	3
Whangaehu River	242	212	12	10.7	4.4	59

7.3.2 Limits and targets for *E. coli*

Reducing *E. coli* concentrations will increase the number of rivers and lakes that are considered suitable for primary contact. The NPS-FM requires 90% of rivers and lakes to be suitable for primary contact (i.e. recreation) by 2040, with *E. coli* being one of the attributes used to determine this. Reducing *E. coli* also contributes to providing for other values such as mahinga kai, Māori customary use, drinking water supply and stock watering.

Limits and targets for *E. coli* have been set using in-stream concentrations rather than loads as for nutrients and sediment, as the level of *E. coli* in a water body at a given time is what indicates the risk of people contracting an infection. They are based on the current state concentrations for each FMU and use the four attribute states from the NOF table for *E. coli* in the NPS-FM. Where an FMU is not currently meeting the limit and objective, the targets for *E. coli* are to be achieved by 2040 (i.e. in line with the freshwater objectives). These limits and targets can be found in Table 8 in Appendix 3. The targets to be reached by 2040 for *E. coli* are variable, and hence imply a priority for effort.

The Committee is aware that the mitigations used in modelling *E. coli* scenarios may not always be sufficient to achieve FMU objectives. Real-time, locally distinct variables for each FMU will require local solutions made up of a range of mitigations at all scales.

7.3.3 Limits and targets for sediment

Reducing the sediment load can improve conditions for macroinvertebrate community health and play a role in native fish health. Reductions also contribute to providing for recreational and cultural values. Sediment has a role in releasing nutrients, particularly phosphorus. Much of the sediment produced in the Ruamāhanga whaitua ends up in Lake Wairarapa and Lake Ōnoke, with impacts on fish communities and on cultural and recreational values.

Due to the limited amount of data available, in-stream concentrations for sediment were not set, so a different process was used to calculate limits and targets. To establish current loads (the limits), annual volumes of sediment lost from erosion processes on native and nonnative land were calculated for each FMU using the SedNetNZ model. This analysis also provided a split between the relative contributions from hill-slope and stream-bank erosion processes. More information can be found in the Jacobs report – "Ruamāhanga catchment modelling – Water quality freshwater objectives and load setting".[28]

The SedNetNZ outputs from the baseline and scenario modelling were used to rank the FMUs based on their contributions to the overall non-native sediment load. From this the Committee identified a sediment reduction target for the Ruamāhanga whaitua based on two parts:

1 In each of the five FMUs producing the greatest load from non-native land (the "top 5" FMUs), reduce annual sediment loads in accordance with the BAU2080 scenario reductions plus an additional 20% of the reductions seen under the SILVER2080 scenario.

   This means the sediment loss target from the "top 5" FMUs would be approximately 390,000 tonnes per annum by 2050, or a reduction of 37% from the current load.

2 For all other FMUs, reduce annual sediment loads in accordance with the reductions seen under the BAU2080 scenario.

   This means the sediment loss target from these FMUs would be approximately 560,000 tonnes per annum by 2050, or a reduction of 21% on the current load.

Table 3 describes both the sediment load limit and sediment targets to be reached by 2050 for each FMU in the Ruamāhanga whaitua. In total, these targets would see an approximately 30% reduction in the total annual sediment load across the whaitua. Sediment targets should be expressed in the subsequent Ruamāhanga whaitua plan change as a percentage reduction from the sediment limits. Sediment limits have been calculated using SedNetNZ. The annual sediment loads from non-native land reaching Lake Wairarapa would be reduced by around 60% by 2050 under these targets, and loads off non-native land to Lake Ōnoke would reduce by around 40% by 2050.

The Committee's position was to reach these sediment targets by 2050, meaning that any planting mitigations would need to be in place 7-15 years before this time in order to be effective. The Committee noted that it would be suitable to review the progress of the implementation of these targets after 10 years, including to identify whether the targets were still considered appropriate (particularly recognising the lack of data currently available in the whaitua on sediment loss and impact) and to identify whether changes in implementation practice were required.

28 http://www.gw.govt.nz/assets/Ruamahanga-Whaitua/Ruamhanga-Catchment-Modelling-Water-quality-freshwater-objectives-and-load-setting-August-2018.pdf

Table 3. Sediment load limits and targets to be achieved by 2050 in the Ruamāhanga whaitua

Interpretation

Current total FMU sediment load = current annual sediment load from all "non-native" and all "native" land
Sediment limit = current annual sediment load from all "non-native" land
Load reduction required by 2050 = reduction in sediment load from "non-native" land only, as annual load
Sediment target = change in annual sediment load from all "non-native" land as % reduction from sediment limit

Freshwater management unit	Current total FMU sediment load	Sediment limit	Load reduction required by 2050	Sediment target
	t/yr	t/yr	t/yr	% reduction from limit
"Top 5" river FMUs				
Taueru River	231,300	229,900	99,600	43
Huangarua River	155,200	144,100	56,100	39
Eastern hill streams	93,000	85,200	33,400	40
Whangaehu River	71,500	71,500	26,300	37
Kopuaranga River	67,800	67,100	12,300	18
All other river FMUs				
Valley floor streams (to Ruamāhanga River)	45,600	45,600	32,100	70
Waipoua River	56,400	43,200	14,000	30
South coast streams	75,100	38,000	13,300	32
Mangatarere Stream	38,300	17,800	11,500	47
Waingawa River	99,200	18,300	10,200	52
Western lakes streams	38,200	7,400	10,000	59
Tūranganui River	18,100	10,300	7,500	70
Valley floor streams (to Lake Wairarapa)	9,200	9,200	6,500	71
Waiōhine River	137,200	22,200	6,400	26
Upper Ruamāhanga River	80,500	31,000	6,300	19
Parkvale Stream	7,100	7,100	4,700	66
Tauherenīkau River	51,400	10,000	3,900	36
Otukura Stream	4,700	4,700	3,500	74
Makahakaha Stream	20,400	20,400	3,200	15
Tauanui River	9,100	3,600	2,600	69
Lakes FMUs[30]				
Lake Wairarapa	10,000	10,000	8,000	80
Lake Ōnoke	4,900	4,900	3,900	80

Note

Figures derived from modelling of sediment loss from net bank and hill-slope erosion processes for land uses at 2017 using SedNetNZ. See Jacobs report.[29]

29 http://www.gw.govt.nz/assets/Ruamahanga-Whaitua/Ruamhanga-Catchment-Modelling-Water-quality-freshwater-objectives-and-load-setting-August-2018.pdf

30 Loads are those from the erosion of lake edge only; they do not include loads from river FMUs to lakes.

Recommendation 38

Progressively reduce sediment loads in the five FMUs producing the greatest sediment load off nonnative land, as modelled under the baseline (current state), in accordance with the targets (to be achieved by 2050) set in Table 3. These "top 5" FMUs are:

- Taueru
- Huangarua
- Eastern hill streams
- Whangaehu
- Kopuaranga.

Recommendation 39

As a priority for implementation in the "top 5" FMUs, Greater Wellington works with communities to establish and implement farm plans on properties where they do not presently exist.

Recommendation 40

Progressively reduce sediment loss from net bank erosion in all non-"top 5" FMUs in the Ruamāhanga whaitua in accordance with the targets (to be achieved by 2050) set in Table 3.

Recommendation 41

Greater Wellington reviews progress in achieving the targets (set in Table 3) 10 years after the notification of the Ruamāhanga whaitua plan change, including describing the extent of mitigation work undertaken and the modelled and/or monitored impacts on water quality in rivers, streams and lakes in the whaitua.

Recommendation 42

Across the whaitua, Greater Wellington supports and drives improved management of critical source areas and high-risk land uses in line with GMP, including through working with industry partners.

Recommendation 43

In the "top 5" FMUs, Greater Wellington undertakes further sub-FMU scale planning with local communities to establish the locations of highest priority in which to undertake sediment mitigation works in order to achieve the targets in Table 3.

Recommendation 44

Greater Wellington aligns the planning, funding and support of sediment mitigation activities, including both riparian restoration and hill-slope erosion and sediment control, with the identified priority areas and targets and the suitable mitigation approaches.

Recommendation 45

Greater Wellington promotes the uptake of sediment mitigation through connections with new research into sediment mitigation measures, practices and adoption mechanisms, and Greater Wellington, industry and community extension services to enable the uptake of constantly improving practice.

7.4 Policies and methods to achieve water quality limits

7.4.1 Policy approach

A non-allocation approach is one where there is no allocation of a discharge limit for contaminants, including sediment, nutrients and pathogens at a property scale. The allocation of pathogen and sediment loads at a property scale is technically difficult or impossible at present. The decision whether to allocate nutrients, or not, is a complex and contentious issue as there is increased awareness within the community of the serious effects of diffuse discharges on water quality and a sense that land managers should be held accountable for the effects of their activities. There is another view, equally strongly held, which holds that our current science is not able to account for contaminant discharge at a property scale at this time and that an allocation based approach to managing this discharge is counterproductive.

The Committee did not feel that the science supported the property scale allocation of nutrients and that the emphasis should be on enabling and encouraging improved practice. This aligns with the Committee's overarching theme of empowering the community to work together and to innovate to make their own change, rather than have a focus on regulation.[31] The Committee considered that a regulatory approach encouraged landowners to do the minimum to meet limits, rather than change practices to meet community objectives for local water quality within FMUs.

In the Ruamāhanga whaitua, sediment is the most significant issue, with nutrients being more of an issue in specific hotspots. This is different from some other regions where nutrients are the most significant issue. The Committee has agreed on a nonallocation policy approach to managing all contaminants, but is recommending different targets, and policies and methods to achieve these targets, for each contaminant. The Committee sees that once nutrient issues in specific hotspots have been resolved, the catchment wide programme for improvement will continue to manage these nutrients.

The non-allocation approach relies on an FMU implementation framework to create a mechanism by which people work together to operate within limits. Within an FMU the emphasis is on working together within catchment communities, the operation of GMP, and the use of farm plans and farm planning. Within the WIP, mitigations such as riparian management, afforestation and retirement are strongly supported as management tools. Current land use practices will continue to be regulated through rules in the PNRP and other national regulations e.g. National Environment Standards. Land use change will also be regulated to ensure that changes do not cause limits to be exceeded.

This approach does not apply to point-source discharges e.g. from wastewater treatment plants, which will continue to be regulated and will be subject to discharge standards.

The recommendations outlined in section 5.7 that specify monitoring, accounting and the use of information are also a vital part of this approach to managing contaminants to achieve discharge limits.

7.4.2 Reviewing whether to implement a nutrient allocation regime in the future

It is important to measure progress towards the achievement of freshwater objectives in each FMU and review the need for a nutrient allocation regime should limits not be met and objectives not achieved. The Committee supports a review of whether a nutrient allocation regime should be implemented in 10 years' time. The review would consider whether limits and objectives were being achieved, whether the tools to administer an allocation regime were adequate and whether alternative management methods would be more appropriate.

If a nitrogen allocation regime were to be introduced in the future, the Committee considers it should be based on an equal allocation regime or allocation based on soil type and/or leaching risk (land use suitability). Grandparenting should not be considered an appropriate nitrogen allocation approach.

31 In particular, see Recommendations 6, 7 and 9

Recommendation 46

Greater Wellington reviews the need for a nutrient allocation regime 10 years after the Ruamāhanga whaitua plan change, or by 2029. NOTE: Grandparenting would not be considered a suitable allocation regime if one were to be implemented.

7.4.3 Farm planning

Farm plans (now called Farm Environment Plans) have been a key feature of the work of Greater Wellington with farmers largely in the hill country of Wairarapa since the 1960s, with a focus on soil conservation and the use of poplar poles. More recently, farm plans have been developed with farmers on more intensively farmed, valley-floor farmland. While these farm plans have achieved much in terms of soil stability, bush retirement and water quality improvements, and have led to strong and respected relationships between Greater Wellington and many farmers, the Committee is keen to build on and strengthen this work and move to a more holistic farm planning approach. It is recognised that farm planning has multiple benefits, including being good business planning.

The approach that the Committee is proposing is a shift to farm planning with a focus on achieving not just environmental outcomes but cultural, economic and social outcomes. This new approach to farm planning would include managing on-farm water quality issues, a sharper focus on critical source areas, and more extensive riparian and wetland restoration, looking at more efficient water use, protecting cultural values and further incorporating GMP actions. Farm planning would also look at ways to support and foster on-farm innovation.

The Committee considered a range of options for the future of Farm Environment Plans, including making them compulsory. After considerable discussion with partners and stakeholders, the Committee agreed that any potential benefits of compulsory Farm Environment Plans were outweighed by the administrative burden.

The Committee considers that farm planning is a critical element in meeting FMU limits and promotes their development. Considerable support for farmers from Greater Wellington and industry organisations will be necessary to facilitate this. As part of the process landowners must share information at an FMU scale to identify issues and mitigations to alleviate their effects.

Recommendation 47

Greater Wellington and industry promote and support the implementation of farm planning as a primary tool of management at a farm scale.

Recommendation 48

Greater Wellington further incentivises and promotes the adoption of farm planning and the activation and review of existing farm plans.

7.4.4 Good management practice (GMP)

GMP is the continuation of improving practices (both urban and rural) to minimise the impacts of land use activities on water bodies and the environment more generally. As knowledge changes, GMP continues to evolve.

GMP is considered the minimum level at which people should be operating. In some areas, more than GMP will be needed to achieve the freshwater objectives, so getting everyone operating GMP is the first step.

In the rural space there is much existing industry GMP guidance that can be a useful source of information and help to manage the impacts of various activities on the environment.

In terms of managing to limits and achieving freshwater objectives within FMUs, there are also opportunities for tailored GMP guidance to be developed by FMU groups to work on FMU specific issues and solutions. GMP can also be incorporated into farm planning to improve farming practices and efficiencies.

In the urban environment, GMP can be used to improve land use practices such as managing municipal wastewater and water supply, and can be applied to the management of river management activities such as gravel extraction.

Recommendation 49

Greater Wellington and iwi partners and industry work together to promote and implement GMP in both rural and urban contexts. Appropriate GMP for the Ruamāhanga catchment should be defined.

Recommendation 50

GMP should be emphasised as part of farm planning.

7.4.5 Practices currently regulated

Many land use practices are already controlled under different legislation and regulation in New Zealand. For example, forestry planting and harvesting is managed through the recent Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017. These regulations control many activities associated with forestry, including earthworks, river crossings, harvesting and replanting, and direct where resource consents are required through either regional or territorial authorities. It is not effective planning to include rules in a regional plan that are covered by a National Environmental Standard, as National Environmental Standards set the requirements.

The PNRP also controls some land use activities that have the potential to have adverse effects on the environment, including cultivation, break-feeding and livestock access to water bodies, earthworks and vegetation clearance. Some of these activities are permitted provided certain thresholds and conditions are met. If the thresholds and/or conditions cannot be met, resource consent is required.

Recommendation 51

Greater Wellington reviews the land use rules structure including for break-feeding, cultivation, and livestock exclusion, to ensure that the requirements are clear to resource users when resource consent is required.

Recommendation 52

Greater Wellington actively promotes and enforces the requirements of the permitted activity rules for break-feeding, cultivation and livestock exclusion.

7.4.6 Regulating land use change

A change from one land use type to another has the potential to exceed water quality limits set in particular FMUs, depending on the new land use activity proposed, the intensity of the activity and the particular climate and soil characteristics of the site etc. When there is a change in a type of land use activity (e.g. from arable to dairy), the potential impacts of the new land use activity on water quality need to be analysed through a resource consent process to ensure that the limit for the FMU is not exceeded. The resource consent process would consider the impacts on the limits for multiple contaminants. Conditions may be placed on the new activity to ensure this occurs.

This approach provides the ability to prevent certain land use changes (decline resource consent) that would otherwise lead to water quality limits not being met in an FMU and associated non-compliance issues for the wider FMU communities. Offsetting could be considered as part of a land use change resource consent application. Land use changes that result in a reduction in contaminant load should be encouraged (do not require resource consent).

Recommendation 53

Greater Wellington provides a new rule for land use changes where a new land use results in an increase in contaminant load as a discretionary activity in the PNRP. A land use change that results in a decrease in contaminant load shall be a permitted activity.

7.4.7 Riparian management

Riparian planting can provide many benefits for water quality, including providing shading to rivers and streams, which decreases water temperature and reduces the growth of periphyton. Riparian planting can also improve the in-stream oxygen available, leading to improvements in the MCI scores that in turn can improve fish populations. Stream bank erosion issues can also be resolved through the use of riparian planting, as the planting can act as a deterrent to stock and reduce trampling. Other studies have shown that riparian vegetation can help to reduce the amount of nutrients (phosphorus and nitrogen), sediment and faecal pathogens (as indicated by ***E. coli***) entering water.

Recommendation 54

Greater Wellington expands its support for extensive, whaitua-wide riparian planting for the management of stream bank erosion and for in-stream benefits (e.g. shade to reduce periphyton), including through:

- Priority in farm planning design and implementation
- Increasing funding for riparian planting, as well as improving access to and awareness of the funds
- Producing plants (e.g. at Akura nursery) or assisting communities to produce plants fit for such a programme

7.4.8 Managing point-source discharges

Point-source discharges are those from a single, identifiable point, e.g. from a property or from a pipe or ditch. This makes them easier to manage than diffuse discharges.

In the Ruamāhanga whaitua, point-source discharges will be managed through the introduction of discharge standards consistent with limits. An allocation system will reflect current loads and targets for each major discharge. See Table 4 for the current loads and targets for the five wastewater treatment plants in the catchment. The targets are based on wastewater being discharged appropriately to land by 2040. An allocation based approach to managing point-source discharges has been strongly supported by the community.

Urban stormwater will be managed through the consenting process in the PNRP. It requires local authorities to apply for "global" consents to manage all their stormwater network discharges together, to ensure that cumulative effects are managed. The two-stage consenting process requires data gathering, and then management of the stormwater network to address issues affecting water quality. Stormwater from large sites such as state highways, and from land use such as subdivision, is managed through other provisions in the PNRP.

Territorial authorities are moving to land disposal of wastewater. This will take some time and incur significant expenditure. Carterton District Council is well down this path. One potential road block is the potential need to consent individual discharges to land, particularly where this may occur on multiple private properties. The irrigation of wastewater to farm land is common in many jurisdictions around the world. Where the effluent is of a sufficiently high standard, and is applied in the right place, this should be promoted. An appropriate permitted activity status rule in the regional plan would achieve this.

The nutrient allocations for wastewater discharges are detailed in Table 4. These have been calculated from information provided by the territorial authorities and are sourced from the nutrient modelling work. The targets assume 100% land disposal by 2040. Some of these figures are likely to be inaccurate and 100% land disposal may not be possible. These target allocations will need to be progressively reviewed.

Recommendation 55

Greater Wellington includes a rule in the PNRP for wastewater discharges to meet the target allocations for nutrients in Table 4. Target allocations are to be met by 2040.

Recommendation 56

Greater Wellington ensures that the nutrient allocations for wastewater discharges in Table 4 are reviewed and changed appropriately when plan reviews occur, including to recognise ongoing changes to and improvements in GMP.

Recommendation 57

Greater Wellington works with territorial authorities to ensure that wastewater is discharged appropriately to land by 2040, recognising that direct discharges to water may occasionally be acceptable but only in exceptional circumstances and only at high flows (e.g. three times the median flow).

Recommendation 58

Greater Wellington works with territorial authorities on a suitable permitted activity rule for the irrigation of wastewater to farm land. This should include conditions on the standard of the discharged effluent, discharge rates and timing, and any restrictions on where this irrigation should occur.

Recommendation 59

Greater Wellington introduces discharge standards for all point-source discharges.

Recommendation 60

Urban stormwater is managed in accordance with GMP and progressive improvement and the PNRP policies and rules.

Table 4. Nutrient limit and target allocations for wastewater discharges to water and to land entering water

Target date: 2040

Wastewater treatment plant	River freshwater management discharge to	Nitrate-N (kg/yr)			Total phosphorus (kg/yr)		
		Current allocation	Target allocation	% reduction	Current allocation	Target allocation	% reduction
Carterton	Mangatarere Stream	129	41	68	4,271	163	96
Featherston	Western lake streams	685	94	86	1,957	0	100
Greytown	Valley floor streams to Ruamāhanga River	293	85	71	1,720	118	93
Martinborough	Eastern hill streams	176	46	74	1,604	110	93
Masterton	Valley floor streams to Ruamāhanga River	858	211	75	6,629	426	94

7.5 Successful implementation of water quality limits

7.5.1 Emergent and existing catchment communities

In the rural environment there are emergent catchment community groups coming together, largely wanting to improve water quality and biodiversity on a catchment scale, with some wanting to get ahead of regulation coming in the PNRP. Some groups are having their first meetings, while others have been operating for many years. They are largely driven by a desire to improve their local environments and build and maintain social connections with each other. One example is the Ponatahi Ecozone.

In the urban environment, community groups (often called care groups) have also been working together, often for many years and are also primarily focused on a particular stream or bush area, driving for environmental restoration and protection. Historically these groups in both the rural and urban spaces are self-determined and have not been driven by regulatory responsibilities. One example is the Mangatarere Restoration Society.

Recommendation 61

Greater Wellington, along with iwi and other partners, supports the formation and coordination of catchment communities in both urban and rural environments.

Recommendation 62

Greater Wellington supports and contributes to the continued development of the Wairarapa Catchment Communities/Pūkaha to Palliser project, which aims to bring catchment community groups together and "make it easier" for them to achieve desired outcomes for their communities, whether they are environmental, social, cultural or economic outcomes.

Recommendation 63

Greater Wellington supports and contributes to the development of a multi-agency delivery platform that will effectively respond and deliver resources effectively and efficiently to the needs of catchment communities. This agency coordinated response will enable communities to make changes ahead of regulation and support innovation.

7.5.2 Compliance and enforcement

Managing compliance with a brand new regime is always challenging. In the case of devolved decision-making and managing to limits at an FMU scale, compliance with provisions in the PNRP will also need to be addressed by the community, which will need to self-monitor the activities in their sub-catchments. The Committee is confident that this new regime will lead to greater compliance, as communities will feel a sense of moral responsibility for and ownership of their local issues.

There are areas where compliance with the existing regime could be improved. The Committee notes that compliance checking of permitted activities is largely absent. In places where the main management tool is a permitted activity rule, there is the potential for poor performance to continue.

Recommendation 64

Greater Wellington writes a compliance plan with the community for compliance with rules in the PNRP, including targets and limits.

Recommendation 65

Greater Wellington implements good compliance systems e.g. strategic compliance across activities (prioritising compliance on higher risk activities).

7.5.3 Further and continuing investigations

Recommendations around monitoring, accounting and review are included in the overarching themes in section 5.7. In addition to this, a number of further investigations will need to be completed in specific areas to better understand effects and/or establish causality to better inform future decision-making.

Recommendation 66

Greater Wellington undertakes a prioritisation exercise to determine the further investigations that need to be completed in the catchment to better understand effects and/or to establish causality to inform future management. The priorities identified in the following recommendation should also be included.

Recommendation 67

The following investigations should be considered priorities as part of the implementation of Recommendation 66:

- Establish sedimentation rates (and gather other information on the impacts of sediment on lake health and river health) for Lake Ōnoke, including to establish a relationship between catchment loads and lake health
- Complete a further investigation, including via modelling, of sediment loads lost from land use activities, including to identify how loads are changing over time
- Complete a further investigation of contaminant pathways through groundwater, including soil vulnerability and attenuation processes.

7.5.4 External support of mitigation activities

The Committee recognises that the scale of change required by some of these mitigations is significant. Access to external funding, including from central government, is going to be central to supporting these mitigations and should be prioritised e.g. applying for funding as part of the "one billion trees" programme.

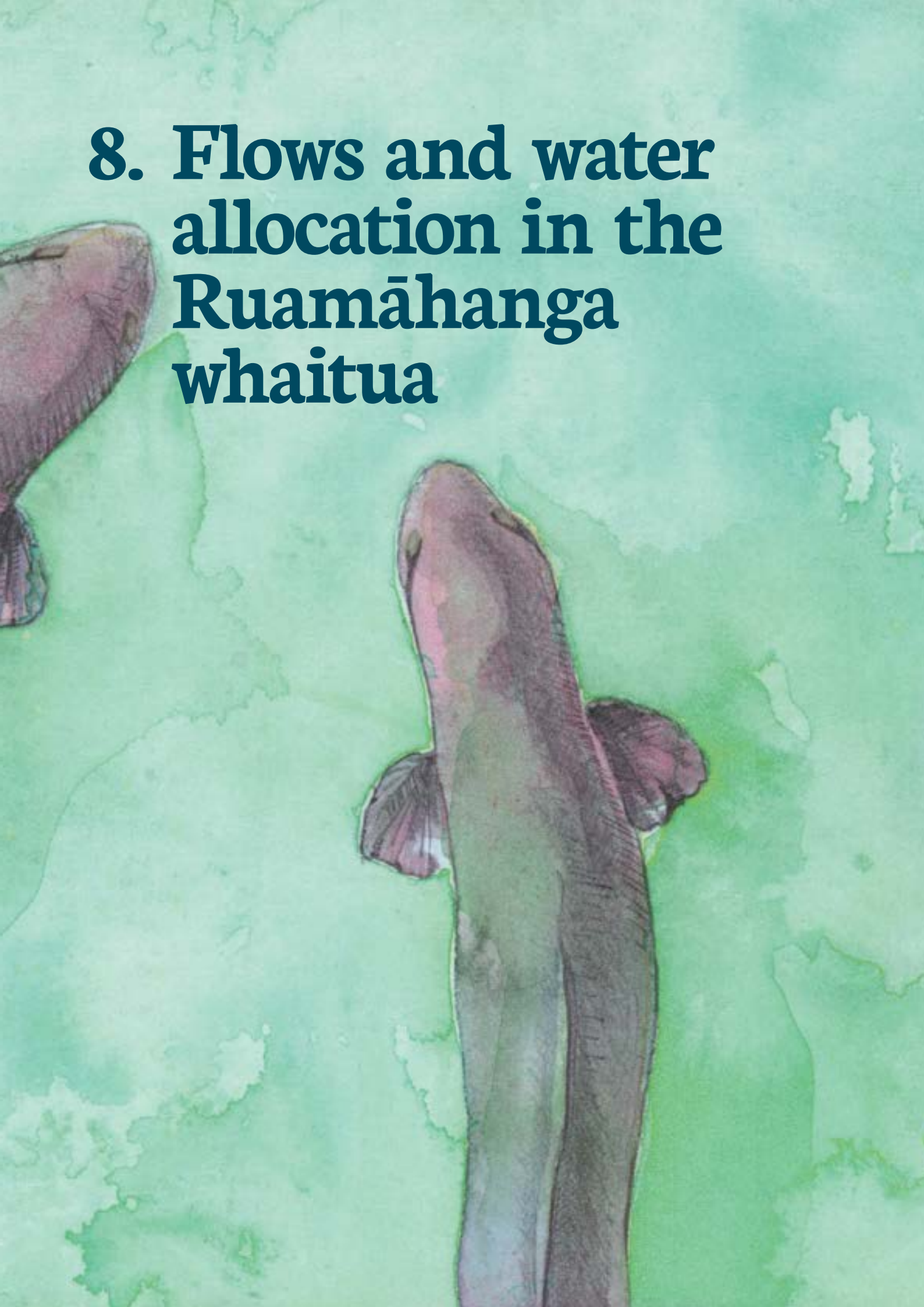
Recommendation 68

Greater Wellington advocates for, and actively seeks out, alternative funding models for mitigation measures in order to promote successful and extensive implementation.

Recommendation 69

Greater Wellington should actively seek capital from central government and promote external capital investment, such as carbon offsetting programmes, in assisting landowners in extensive uptake of sediment mitigations across the whaitua.

8. Flows and water allocation in the Ruamāhanga whaitua



8 Flows and water allocation in the Ruamāhanga whaitua

8.1 Background – key issues and drivers

We value our fresh water in many ways, whether it is for the water's life-supporting capacity or recreational values, or the economic value that water brings to the region. How we manage and use fresh water to provide for the range of values is a challenge.

Fresh water within a watercourse provides a life-supporting capacity for the natural ecosystems that live in and around the watercourse, whether they be invertebrates, plant life or fish species.

Fresh water also has a multitude of uses outside the watercourse, including for drinking water, irrigation, industrial use and household use for bathing and washing. Many of these uses not only are necessities for life, but also enable the economic prosperity of the region.

The community also values water within a watercourse for recreational purposes such as swimming, fishing, wading and boating.

The Committee is mindful of the huge range of values that fresh water holds in the Ruamāhanga whaitua and has set a range of objectives (described in the "Freshwater objectives for the Ruamāhunga whaitua" chapter) to provide for those values. The Committee also recognises that the achievement of the freshwater objectives is dependent on the health of a river being addressed as a whole, and consequently the need to integrate policy tools for river management and managing discharges and land use together with water allocation policies.

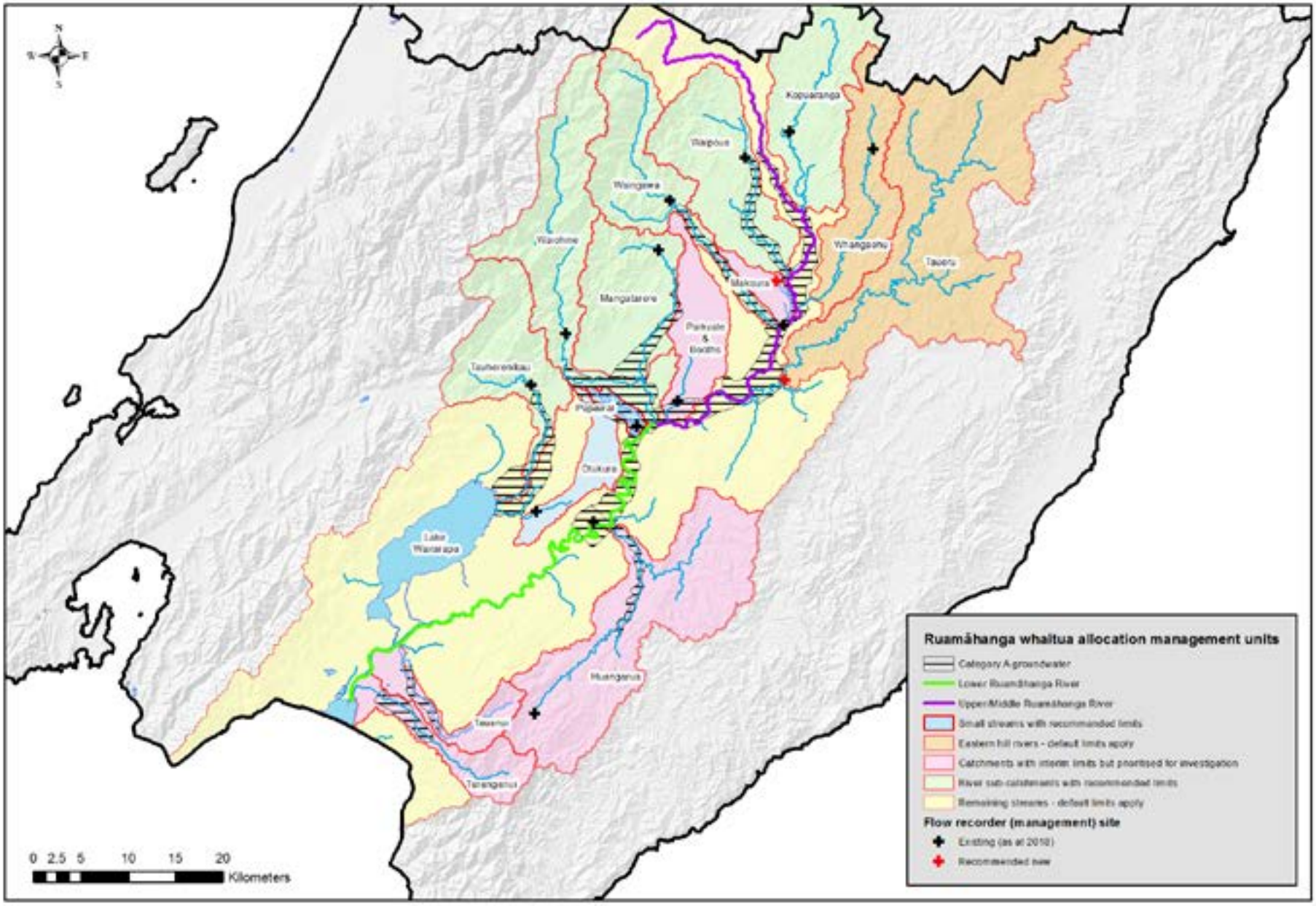
8.2 Water quantity management units

The water allocation management units for surface water differ slightly from the FMUs for water quality described in Chapter 4. The main reason for the differences is to account for Category A groundwater resources as part of the surface water management unit.

For groundwater, the PNRP defines allocation limits for catchment management units and catchment management sub-units. The catchment management units and sub-units are the equivalent of groundwater water management units required under the NPS-FM. The Committee is not recommending any changes to the groundwater units described in the PNRP.

Maps of water allocation freshwater management units for surface water and Category A groundwater are shown in Figure 7.

Figure 7. Map of Ruamāhanga water allocation management units



8.3 Policy approach to achieving water quantity limits

The NPS-FM requires allocation limits and minimum flows (or minimum water levels) to be set for FMUs. The limits need to be set in order to meet the freshwater objectives. The PNRP already sets allocation amounts and minimum flow levels for the rivers, streams and groundwater in the Ruamāhanga whaitua. The Committee considers that the existing framework for water allocation in the PNRP is largely appropriate, but where they see the need for change, recommendations have been made.

The Committee has reviewed the limits set in the PNRP for each water allocation management unit to ensure they are set at levels to provide for the values and objectives they have identified. The allocation limits and minimum flows that the Committee has recommended have been based on ecological values, but the Committee recognises that in providing for ecological values many other values such as cultural and recreational values are also provided for.

The Committee considers that there are measures in addition to allocation limits and minimum flows, such as efficient use, GMP and storage, that are required to maximise the use of water available in the Ruamāhanga whaitua. Ensuring that these measures are implemented also builds the community's resilience to the pressures of a drying climate and reducing flows under climate change. As discussed in previous sections, the Committee is of the view that the whole community within the Ruamāhanga whaitua, whether urban, industrial or rural, will need to work as one and each do their part to ensure that water is used in an efficient and effective manner.

8.3.1 Equity and good practice

Water is used by all sectors of the community, whether for the basic necessities of life, watering a garden or irrigating a crop. The Committee is of the view that every water user must do their bit to use water efficiently, especially during times of low flow, and that it not be left to one sector of the community to make all the efficiency gains. See Recommendation 10 in section 5.6.

8.3.2 New water – attenuation, storage and harvesting

t is vital that we make better use of available water resources as we enter an era of increasing shortage under climate change. The Committee sees that a combination of tools, such as improved efficiency together with future storage and attenuation options, will improve reliability of supply and increase resilience for the community.

As discussed in previous sections, the Committee supports an integrated, catchment-wide approach to managing the water bodies of the Ruamāhanga whaitua. Attenuation of water in soils, wetlands, lakes and groundwater not only assists in improving reliability of supply during the dryer months, but also enhances river or stream base flow and the quality of habitat and ecology across the whaitua.

As an example, a high-level analysis of managed aquifer recharge mechanisms indicated that managed aquifer recharge is potentially a feasible management option from geological and hydrological perspectives.[32] This analysis showed how water could be infiltrated into shallow aquifers in parts of the whaitua without causing significant ponding.

Water storage and harvesting can occur at a range of scales, from a large, centralised storage facility to on-farm storage and individual household rainwater tanks. While these forms of storage increase the reliability of supply, they are unlikely to provide other in-stream benefits such as habitat improvement.

The Committee has clearly stated that no single mechanism (attenuation, storage or harvesting) will improve the reliability of water supply across the Ruamāhanga whaitua. Multiple mechanisms and opportunities will need to be pursued. The Committee therefore wants to ensure that a variety of attenuation, water storage and harvesting options (and efficiency measures) are enabled in order to improve resilience and reliability of supply.

The Committee recognises that their recommendations to increase minimum flows in certain rivers and further restrict Category A groundwater takes (see section 8.4) reduce the reliability of water supply for those particular users. It is therefore vital that the community work together to explore the options available.

The PNRP contains policies (Policy P11 and Policy P120) on water storage. The Committee considers that these policies, together with the recommendations below, provide the necessary support for a variety of attenuation and storage options that can help improve reliability and resilience.

32 http://www.gw.govt.nz/assets/Managed-Aquifer-Recharge-Exploration-Scenario-Modelling-Summary-Paper-27-July-2017.pdf

Recommendation 70

To improve water supply reliability, the Ruamāhanga whaitua integrated land and water management system should:

- Integrate multiple management options for water retention, including attenuation, storage and harvesting at a range of scales, and efficient use in the long and short terms, rather than be dependent on any one mechanism
- Actively promote attenuation of water in soils, wetlands, lakes and groundwater systems across the catchment
- Ensure an equitable approach to improved water storage and water use efficiency by both rural and urban users

Recommendation 71

Greater Wellington includes in the PNRP a policy that recognises the importance of the role of attenuation of water in soils, wetlands and lakes and their riparian margins in the whaitua to support groundwater recharge and wetland restoration and help build resilience in communities.

Recommendation 72

Greater Wellington includes in the PNRP a policy that recognises the benefits of multiple mechanisms (such as storage, harvesting, attenuation and aquifer recharge) that increase resilience and water reliability of supply.

Recommendation 73

Greater Wellington includes in the PNRP a policy, or amends existing policy, to provide for circumstances where water may be taken at higher flows for purposes wider than storage e.g. aquifer recharge.

Recommendation 74

Greater Wellington further investigates integrated solutions to water reliability. These should include integrating storage, harvesting, attenuation and managed aquifer recharge, and facilitate pilot projects to prove feasibility.

8.3.3 Efficient use

The efficient use of water refers to the quantity of water being used. It is the actions of the individual or organisation using water that are important. Efficient use includes not wasting, applying at the right time, using efficient technologies and changing uses to generate a higher return for a similar or lesser amount. Efficient water use relates to the performance of the water use system.

The present management of water use already includes efficiency measures in the PNRP, but there are significant benefits in becoming more efficient. In fully allocated catchments, using water more efficiently means water can be freed up and made available to users who would otherwise have no access, or be available to the environment. Being able to free up water is the reason for efficient use being so important and it is now specifically directed by the NPS-FM.

Under the PNRP, surface water in the Ruamāhanga whaitua and eight of 14 groundwater management units is now fully allocated. The Committee is therefore keen to ensure that all water is used efficiently in order to maximise the use of the resource available and potentially "free up" water for new users.

The main consumptive users of water in the Ruamāhanga whaitua are group and community water supplies, irrigation and water races. The Committee considers that efficiencies can be made by each of these groups.

Recommendation 75

Greater Wellington requires users of water to manage their take and use in a more equitable manner and to ensure GMP, including to:

- Seek efficiency gains when consents are renewed for all water use activities
- Promote small-scale storage on urban and rural properties in order to increase resilience and to encourage everyone to take part in improving water use efficiency
- Require takes from directly connected groundwater to reduce and cease at times of low flows in rivers in the same way that surface water takes are managed
- Require community supply takes to do more to reduce take at minimum flows, while protecting the ability to take water for people's health needs
- Reduce water race takes at minimum flows to only the water required to provide for people's domestic needs and stock drinking needs.

8.3.4 Non-consumptive takes

The Committee recognises that there are takes in the Ruamāhanga whaitua where the water is taken and discharged back to the original source. Examples of this type of take include hydro power schemes, Henley Lake and Queen Elizabeth Lake. In these cases, the provisions of the PNRP require the take to cease at minimum flow, otherwise the activity defaults to a prohibited status. The Committee considers that "non-consumptive" takes could be provided for below minimum flows.

Recommendation 76

Greater Wellington investigates policy options in the PNRP to provide for "non-consumptive" takes. Consideration will need to be given to:

- The volume of the take and discharge
- Ensuring that the efficiency of the water use is maximised in order to return a similar amount of water to the source
- Maintaining the quality of the discharge in relation to the quality of the source water
- The distance between the abstraction and discharge points
- Any net ecological benefits of the use of the water

The efficiency and quality requirements of this policy would come into effect five years after the plan change. Non-consumptive takes do not include irrigation.

8.4 Water take limits – minimum flows and allocation amounts

Policy B1 of the NPS-FM requires minimum flows and allocation limits to be set to give effect to the objectives in the NPS-FM.

FMUs (for water allocation) were split into two main groups for the review of minimum flows and allocation limits by the Committee. One group contained the larger, faster-flowing, gravel-bed rivers, including the main stem of the Ruamāhanga itself. The other group contained the smaller valley floor streams and rivers rising in the eastern hills. The smaller valley streams are discussed in section 8.4.10.

For the group of gravel-bed rivers, the minimum flow assessment focused on ecological values, and especially the amount of physical habitat available to fish at low flows. In these types of river it is considered more likely that habitat space becomes a limiting factor for some fish communities before other factors such as water temperature increases and oxygen level depletion.

To provide for ecological values and to better protect rivers from the pressure of climate change that will, over time, drive drier summers and lower flows in rivers, the Committee looked at the minimum flows currently set in the PNRP for the rivers and streams in the Ruamāhanga whaitua.

In order to determine the level of habitat protection the minimum flow should provide, the Committee considered a range of fish species (both native species and trout) found in the Ruamāhanga whaitua and their habitat requirements. The Committee selected the panoko (torrentfish) as an appropriate measure, as panoko are found throughout the Ruamāhanga whaitua and are a species with relatively high flow demands. A minimum of 90% of the habitat available at the natural mean annual low flow (MALF) was selected as an appropriate level of protection; at this level there is high confidence that physical habitat will not be a limiting factor for existing fish populations. Panoko flow demands and habitat preferences are similar to those of adult trout. Therefore, trout are well catered for by the objectives set for panoko.

Most of the minimum flows set in Table 7.1 of the PNRP are applied in such a way that they are close to or already achieve the desired level of protection for the rivers and streams in the Ruamāhanga whaitua. Where significant changes in the minimum flows are required in order to meet the objectives, the Committee wants to ensure that water users have time to adapt and prepare for the change and has therefore recommended that the changes occur over time.

The Committee recognises that raising the minimum flows reduces the reliability of water for users during the dryer months, resulting in economic impacts for those users, particularly if they do not make any changes to how they operate. The Committee wants to encourage and see innovation developed and shared by water users and communities.

The Committee is recommending changes to seven major water allocation FMUs (Kopuaranga, Waingawa, Upper/Middle Ruamāhanga, Mangatarere, Waiōhine, Tauherenīkau and Lower Ruamāhanga) – these recommendations are outlined below. The existing consented allocation amounts discussed in the paragraphs below are based on consents granted as at June 2018.

A summary of all recommended minimum flows for the major water allocation FMUs, and how these will inform the way that different takes (i.e. surface water, Category A, community supply and water races) are restricted and/or must cease at these flows, is shown in Table 7 in Appendix 2.

For the following sections the river name refers to the relevant water allocation management unit shown in Figure 7.

8.4.1 Kopuaranga River

The existing minimum flow in the Kopuaranga River (270L/s) almost provides for the level of fish habitat protection (90% habitat available at MALF) the Committee is seeking. Combined with the PNRP allocation limit (180L/s), this minimum flow is likely to result in only marginal changes to key indicators of low to mid flow regime (i.e. an increase in the duration of low flows and a reduction in median flows). However, a small increase in the minimum flow of 10L/s to 280L/s was seen as desirable to meet the 90% habitat objective more fully. The in-stream benefits of this small change alone are unlikely to be substantial; correspondingly the impact on reliability for existing users is unlikely to be significant.

The Committee recommends capping allocation amounts at the existing consented use (150L/s). The apparent headroom in water availability in this catchment (30L/s) under the PNRP regime is almost all taken up by existing permitted activities (estimated to be about 20L/s). The Committee felt that when the level of permitted activity use is taken into account, no further consented use can reasonably be justified. Together this cap on allocation amount and the tightening of minimum flow are considered appropriate to afford the river a greater level of future resilience (including under a drying climate).

Recommendation 77

Greater Wellington includes in the PNRP the following water allocation limits for the Kopuaranga River:

1 Increase the minimum flow from 270L/s to 280L/s

2 Cap the amount of water available to be allocated through consents at the existing consented use. (Existing consented use at June 2018 is 150L/s)

8.4.2 Waipoua River

The existing minimum flow (250L/s) for the Waipoua River provides for a relatively low level of fish habitat protection (about 70% habitat available at MALF) compared with other rivers. The Committee's preference is to increase the minimum flow to 340L/s, a level at which 90% of habitat is protected and the risk of adverse in-stream impacts is reduced.

Supporting the recommendation to increase the minimum flow on the grounds of habitat protection is a Committee wish to treat the Waipoua as a "model river" for urban and rural GMP. It is a river with high visibility and value to a broad cross-section of the Wairarapa community. It is also characterised by very low summer flows (drying reaches in some places), warm water temperatures, poor water quality at times (including toxic algal blooms) and a degradation of recreational opportunities (e.g. Tanks Pool). While minor flow augmentation by way of increasing the minimum flow will not solve these issues, small gains in the amount of water held in the channel at low flows are considered an important part of the overall package to improve the river condition. Furthermore, the Waipoua River is expected to experience more severe summer flow recessions in a warming climate, and the increased minimum flow will provide an additional countermeasure to this (by at least reducing the extent to which abstractions exacerbate low flows).

Similarly to the Kopuaranga River, the Committee wishes to cap the allocation in the Waipoua River at the existing consented use (116L/s) rather than allow the additional 29L/s that are potentially available under the PNRP to be taken up. This provides for a better level of risk management of the river coming under pressure from a drying climate. Further, permitted activity use is estimated to be about 10L/s and almost fully accounts for the available headroom in allocation, meaning no further consented use can reasonably be justified.

The number of existing consent holders (nine) affected by an increase in minimum flow in the Waipoua catchment is relatively modest. However, the reduction in reliability of supply for these individuals may be significant. With this in mind, the Committee is recommending that the change to minimum flow be brought in progressively over time rather than take immediate effect.

Recommendation 78

Greater Wellington includes in the PNRP the following water allocation limits for the Waipoua River:

1 Increase the minimum flow from 250L/s to 340L/s over time as follows:

   a Five years after plan change (or in 2024), increase the minimum flow to 300L/s

   b 10 years after plan change (or in 2029), increase the minimum flow to 340L/s

2 Retain the current step down level at which takes shall reduce at 300L/s until the first minimum flow increase in 1 above occurs

3 Cap the amount of water available to be allocated through consents at the existing consented use. (Existing consented use at June 2018 is 116L/s)

8.4.3 Waingawa River

The allocation from the Waingawa River is relatively high compared with other rivers in the whaitua. About two-thirds of the water being taken is for town supply (Masterton) and the Taratahi water race. A proportion of these large takes continues below minimum flows in order to provide water for domestic and stock drinking needs. Several minimum flow thresholds are described in the PNRP (1,900L/s, 1,700L/s and 1,100L/s)[33] to ensure that all other types of take in the catchment are progressively reduced as river flow drops.

The Committee wishes to retain the existing PNRP step down level of 1,900L/s and the minimum flow for all uses at 1,700L/s. These are considered to represent an appropriate balance between giving effect to the 90% habitat protection objective while maintaining the existing reliability of supply for users.

The Committee considers that the PNRP minimum flow (1,100L/s) should be removed. Using the 1,100L/s minimum flow to manage takes would let flows fall well below the habitat objective threshold. The Committee considers that all reasonable efforts to reduce takes in the catchment should have been made before this flow is reached. Further, the 1,100L/s threshold is currently used to manage only two existing consents (Masterton municipal supply and the Taratahi water race); restrictions and cease takes are implemented at the higher thresholds in all other consents. Therefore the Committee recommendations effectively formalise the status quo minimum flow management levels. At the minimum flow of 1,700L/s, the Masterton municipal supply would be required to reduce the amount of water taken to that required for the health needs of people, and the water race takes would reduce to the amount of water required for domestic use and stock drinking water. This is the same requirement as in Schedule R of the PNRP.

The existing allocation from the catchment (1,184L/s) is above the default allocation amount in the PNRP. The Committee has some concerns about the amount of water that continues to be taken below minimum flows from the Waingawa River. These takes are primarily for public supply and the water race but also include Category A groundwater users taking for other purposes. The Committee has noted that the Waingawa River is affected by a lack of summer flow and a loss of braiding at times across the plain near Masterton. This is further exacerbated by natural losses of the river to groundwater. Rather than reduce the overall amount allocated to existing users, the Committee's recommendation is to ensure that more water is retained in the channel during times of water stress. This is to be achieved by increasing restrictions on taking water to just the volumes necessary to provide for domestic and stock water needs, and includes the requirement that Category A groundwater users taking for other purposes reduce take (and cease take in the future) at the same time as surface water takes.

Recommendation 79

Greater Wellington includes in the PNRP the following water allocation limits for the Waingawa River:

1. Remove the existing PNRP "lower" minimum flow of 1,100L/s.
2. Increase the minimum flow to the existing PNRP[34] "higher" minimum flow of 1,700L/s over 10 years as follows:
   a. Five years after plan change (or in 2024), increase the minimum flow to 1,400L/s for all takes for community and group water supplies and water races
   b. 10 years after plan change (or in 2029), increase the minimum flow to 1,700L/s for all takes
3. Retain the efficient use and unused water policies in the PNRP to work towards reducing the consented allocation in line with the allocation amount specified in the PNRP (920L/s)

33 Schedule R of the PNRP

34 Schedule R of the PNRP

8.4.4 Upper/Middle Ruamāhanga River

In the PNRP the Ruamāhanga River is split into three management units: the Upper river is defined as reaches upstream of the confluence with the Waingawa River; the Middle river is defined as the reaches between the Waingawa and Waiōhine Rivers; and the Lower river is all reaches downstream of the Waiōhine confluence to the coastal boundary. Consents in both the Upper and Middle Ruamāhanga in the PNRP are controlled by a single management point, "Ruamāhanga River at Wardells", and a common minimum flow (2,400L/s). Discrete allocation limits are set in the PNRP for the Upper and Middle Ruamāhanga catchment management units, but the limits are very similar, as are existing levels of allocation.

Given the similarity between the Upper and Middle Ruamāhanga catchment management units in terms of both river characteristics and management practice, they were considered as a single water allocation management unit (called the Upper/Middle Ruamāhanga) during the review of the allocation regime.

The existing minimum flow (2,400L/s) for the Upper/Middle Ruamāhanga River reach provides for a relatively low level of fish habitat protection (about 70% habitat available at MALF) than other rivers. The Committee's preference is to increase the minimum flow to 3,250L/s, a level at which 90% of habitat is protected and the risk of adverse in-stream impacts is reduced.

Supporting the recommendation to increase the minimum flow on the grounds of habitat protection is recognition that the Ruamāhanga River is highly valued by a broad cross-section of the Wairarapa community and that currently some values are considerably compromised at times of low flow. In particular, recreational opportunities (e.g. swimming) and cultural values have been degraded. Minor flow augmentation by way of increasing the minimum flow may not solve these issues, but gains in the amount of water held in the channel at low flows is considered an important part of the overall package to improve the river's health. Furthermore, the Ruamāhanga River is expected to experience more severe summer flow recessions in a warming climate and the increased minimum flow will provide some additional countermeasure to this (by at least reducing the extent to which abstractions exacerbate low flows).

The Committee recommends capping the allocation at the existing consented use (1,910L/s) rather than allowing the additional 530L/s that are potentially available under the PNRP to be taken up. Further allocation beyond the current consented use is incompatible with the Committee's view on the existing condition of the river and the extent to which some values have already been eroded. Furthermore, the PNRP allocation amount is over generous when viewed in the context of likely natural flow reductions under climate change.

The Upper/Middle Ruamāhanga River reach is recognised as a very important source of water for a substantial number of existing consent holders (about 60). These users will all be affected by an increase in minimum flow. The reduction in reliability of supply for these individuals may be significant. The economic consequences of increasing the minimum flow have been considered by the Committee, and with this in mind they recommend that the change to minimum flow be brought in progressively over time rather than take immediate effect.

Recommendation 80

Greater Wellington combines the Upper Ruamāhanga and Middle Ruamāhanga catchment management units into a single water allocation management unit through a change to the PNRP.

Recommendation 81

Greater Wellington includes in the PNRP the following water allocation limits for the Upper/Middle Ruamāhanga catchment:

1 Increase the minimum flow level from 2,400L/s to 3,250L/s over time as follows:
   a No change for 10 years.
   b 10 years after plan change (or in 2029), increase to 2,700L/s.
   c 15 years after plan change (or in 2034), increase to 2,970L/s.
   d 20 years after plan change (or in 2039), increase to 3,250L/s.
2 Retain the current stepdown level at which takes shall reduce at 2,700L/s until the first minimum flow increase in 1 above occurs.
3 Cap the amount of water available to be allocated through consents at the existing consented use. (Existing consented use at June 2018 is 1,910L/s.)

8.4.5 Mangatarere Stream

The Mangatarere Stream is split into an upper and a lower catchment for the purposes of allocating water. The existing minimum flows for both parts of the stream are set well above MALF (240L/s in the upper catchment and 200L/s in the lower) in the PNRP. These flows provide for a level of fish habitat protection that is more protective than other rivers in the whaitua. The Committee habitat objective is already met by these minimum flows and no justification was seen for increasing the minimum flows, especially given the relatively low reliability of supply that water users already experience in this catchment.

The Mangatarere Stream is highly allocated, with the existing consented use of 465L/s equating to significantly more than the MALF at the bottom of the catchment. The stream is also known to suffer from poor water quality and ecological health at times. The highly protective minimum flows are intended to offset to some extent the worst impacts of the high level of allocation. The Committee considered that a reduction in the minimum flows could therefore only be considered if allocation were significantly reduced.

While the high level of allocation and poor water quality of the catchment is recognised, there is no clear pointer to the size of reduction in allocation that would be required to see meaningful improvements in the stream. A reduction to the PNRP default amount (110L/s) would have a very significant impact on existing users. For these reasons the Committee's preference is to keep the default allocation amount in the PNRP and as resource consents are renewed and the efficiency and unused water policies of the PNRP are applied, the amount of water allocated to users in the Mangatarere catchment will reduce.

It is expected that some mitigation of the impacts of high allocation may be achieved by requiring Category A groundwater takes to cease at minimum flow. Category A groundwater takes collectively account for about 95L/s, and retaining this flow in the stream during the lowest flow periods is considered an important part of the recommended policy package for this catchment. Furthermore, other parts of the policy package, such as supporting the Mangatarere Restoration Society efforts and strengthening restrictions at low flows on town supply and the Carrington water race, are also seen by the Committee as preferable to reducing the allocation amount.

8.4.6 Waiōhine River

Like the Waingawa River, the Waiōhine River supports large town supply and water race takes. A proportion of these large takes continues below the minimum flows in order to provide water for domestic and stock drinking needs. Two minimum flow thresholds are prescribed in the PNRP (3,040L/s and 2,300L/s) to ensure that takes for other purposes are progressively reduced as river flow drops.

The Committee wishes to retain the higher minimum flow of 3,040L/s. The Committee considers that this threshold represents an appropriate balance between giving effect to the habitat objective and largely maintaining existing reliability of supply for users. However, it is recommended that the lower PNRP minimum flow (2,300L/s) be removed. This minimum flow is well below that which would provide for the habitat objective (2,990L/s). The Committee considers that all reasonable efforts to reduce takes in the catchment should have been made before 2,300L/s is reached.

Currently the 2,300L/s threshold is used to manage the town supply and water race takes, with some amount of reduction in take required at this flow. Other than these takes, the Committee recommends the PNRP minimum flow. The Committee recommends that town supply and water race takes further reduce their takes from current levels at the 3,040L/s minimum flow to just those volumes necessary for the health needs of people and stock drinking needs.

The total existing allocation from the catchment (950L/s) is moderate but below the default allocation amount in the PNRP (1,590L/s). The Committee views the PNRP allocation amount as too generous and recommends capping the allocation at the existing level of use. The reasoning for this is similar to that for the other rivers in which there is potentially some allocation headroom on paper: further allocation would be incompatible with the Committee's view that more resilience needs to be built in to the river management regime to counteract the likely future impacts of climate change. Furthermore, the Waiōhine River is a high value waterway, especially for recreation and water quality, and the Committee does not want to accept the risk that a further allocation will erode these values.

Recommendation 82

Greater Wellington includes in the PNRP the following water allocation limits for the Waiōhine River:

1 Remove the existing PNRP "lower" minimum flow of 2,300L/s.

2 Retain the "higher" minimum flow level of 3,040L/s.

3 Cap the amount of water available to be allocated through consents at the existing consented use. (Existing consented use at June 2018 is 950L/s).

8.4.7 Tauherenīkau River

Two minimum flow thresholds are given in the PNRP (1,300L/s and 1,100L/s)[35] to ensure that takes from the Tauherenīkau River catchment are progressively reduced as flows drop.

The Committee wishes to retain the 1,300L/s minimum flow level as this is considered to represent an appropriate balance between giving effect to the habitat objective while largely maintaining existing reliability of supply for users. However, it is recommended that the lower PNRP minimum flow (1,100L/s) be removed. This flow would be below the 90% habitat objective threshold for this river (1,200L/s). The Committee considers that all reasonable efforts to reduce takes in the catchment should have been made before 1,100L/s is reached. As only one existing resource consent uses the 1,100L/s flow, this recommended change is minor – all other consents are required to cease at 1,300L/s. The minimum flow is recommended to be above the 90% habitat objective (by 200L/s) to recognise that a significant take, the Longwood water race, will continue to occur below the minimum flow.

35 Schedule R of the PNRP

The total existing allocation from the catchment (234L/s) is moderate but below the default allocation amount in the PNRP (410L/s). However, the Committee views the PNRP allocation amount as not protective of reducing low flows in a drying climate, and recommends capping the allocation at the existing level of use. The reasoning for this is similar to that for the other rivers where there is potentially some allocation headroom on paper: further allocation would be incompatible with the Committee's view that more resilience needs to be built in to the river management regime to counteract the likely future impacts of climate change.

Recommendation 83

Greater Wellington includes in the PNRP the following water allocation limits for the Tauherenīkau River:

1 Remove the existing "lower" PNRP minimum flow of 1,100L/s.

2 Retain the existing "higher" PNRP minimum flow of 1,300L/s.

3 Cap the amount of water available to be allocated through consents at the existing consented use. (Existing consented use at June 2018 is 234L/s.)

8.4.8 Lower Ruamāhanga

The existing minimum flow (8,500L/s) in the Lower Ruamāhanga reach (which extends from the Waiōhine River confluence to the Lake Wairarapa outlet) looks at first glance to provide a relatively low level of fish habitat protection (just under 70% habitat available at MALF) compared with other rivers. However, recent flow/habitat calculations by the Cawthron Institute have shown that this minimum flow is still meeting the 90% fish habitat objective set by the Committee. This is because the morphology of the Ruamāhanga River in the lower reaches is quite different from that of the upper reaches and tributary rivers, having more runs and pools than riffles. This difference in morphology means lower flows can still support a good amount of fish habitat. Therefore the Committee is not recommending any changes to the existing minimum flow.

The allocation from the Lower Ruamāhanga River reach is high (1,883L/s) as a proportion of low flow and higher than the PNRP default amount (1,475L/s[36]). The Lower Ruamāhanga River is unusual in the whaitua in that the overall impact of abstractions on this reach is determined more by the ratio of total upstream allocation to river flow than by the takes specifically within its length. When a comparison of overall catchment takes is made, the existing allocation is close to the PNRP allocation amount for the full river catchment.

The Committee considered what changes to allocation amounts may be necessary in the Lower Ruamāhanga. The difference between the PNRP allocation amount and existing use is in the order of 400L/s. There is no clear evidence to suggest that an adjustment to the allocation from the lower river reaches will result in meaningful benefits. This is especially so because most of the allocation in this zone occurs in the bottom half (below Waihenga) where the form of the river comprises connected runs and pools, even at low flows. The Committee's preference is to achieve improvements in overall river condition in the lower reaches through the cumulative effect of all policy implementation in the catchment, rather than shift the allocation amount.

Recommendation 84

For the Lower Ruamāhanga catchment, Greater Wellington retains the existing PNRP minimum flow and allocation amounts.

8.4.9 Category A takes across the Ruamāhanga Whaitua

Category A groundwater takes are considered to be those groundwater takes that have a direct connection to the nearby river or stream, i.e. pumping from a bore has an effect on a nearby river, stream or lake. The Committee considers that allowing Category A groundwater users to continue to take water and affect nearby streams when the flows are low does not provide for in-stream values, nor is it equitable with surface water users who must cease taking at the minimum flows.

36 The default allocation for the Lower Ruamāhanga (1,475L/s) in the PNRP is likely to change due to the movement of the Category A/B groundwater boundary in the Lower Ruamāhanga groundwater zone

Objective B2 of the NPS-FM requires any further over-allocation of fresh water to be avoided and phase out existing over-allocation. Taking of water below a minimum flow limit is considered over-allocation. Therefore the Committee considers it necessary for Category A groundwater takes to cease take at minimum flows to ensure that the requirements of the NPS-FM are met.

The Committee recognises that for Category A groundwater users, a cease take at minimum flows will have a significant impact. For this reason the Committee is recommending that the cease take not occur immediately, but after a period of time to allow users to adapt, use innovation and prepare for the change.

The Committee is also aware of the discontent of some Category A users, who consider that their groundwater takes are not directly connected to nearby rivers or streams. To ensure that the cease take provisions only apply to those Category A groundwater users where there are direct connections, the Committee is recommending that Greater Wellington undertake further investigations to ensure that those groundwater takes classified as Category A do have a direct connection with a nearby river, stream or lake.

Recommendation 85

Greater Wellington changes the provisions of the PNRP to ensure that in 10 years' time (or in 2029) those takes classified as Category A groundwater must cease their take when the nearby river or stream reaches its minimum flow.

Recommendation 86

Greater Wellington undertakes further investigations to ensure that those groundwater takes classified as Category A do have a direct connection with nearby river, stream or lake.

8.4.10 Small streams

Under the provisions of the PNRP, many of the smaller streams and rivers have been incorporated within the larger parent catchment, and therefore the minimum flow and allocation amounts for the parent catchment apply to the smaller streams or rivers. For example, the Huangarua River is included within the Lower Ruamāhanga and subject to the minimum flows and allocation amounts for the Lower Ruamāhanga. The Committee considers that, in some cases, the minimum flow for the parent catchment does not provide adequate protection for the smaller rivers and streams, as the correlation of when low flows occur in the parent catchment may not be reflected in the tributary. The Committee therefore recommends that investigations be undertaken to determine the specific minimum flow requirements and allocation limits for smaller streams and rivers where particular pressures are occurring.

The Committee also recommends separating tributaries of the Ruamāhanga River in the Eastern hills rivers, Eastern hills streams and Valley floor streams FMUs from the minimum flow and allocation limits set for the Lower Ruamāhanga River.

Recommendation 87

Greater Wellington undertakes targeted investigations into the Parkvale Stream, Booths Creek, Mākōura Stream, Kuripuni Stream and Tauanui and Tūranganui Rivers to determine the specific minimum flow requirements and allocation limits for each river or stream, within three years of the plan notification or by 2022.

In the interim, Greater Wellington includes in the PNRP the following minimum flows and allocation limits:

1 For Parkvale Stream and Booths Creek, retain the current allocation limits and minimum flows in the PNRP.

2 Separate the Mākōura and Kuripuni Streams from the Upper Ruamāhanga limits currently in the PNRP and set allocation limits at the current consented allocation and minimum flow at 100L/s based on the management point Colombo Road on the Mākōura Stream.

3 Separate the Tauanui River from the Lower Ruamāhanga limits currently in the PNRP, and set an allocation limit at the current consented allocation and minimum flow of 30L/s based on the management point Iraia on the Ruakokoputuna Stream (correlations indicate that this represents 90% of MALF in the Tauanui and Tūranganui).

4 Set the allocation limit for the Tūranganui River at the current consented allocation and set a minimum flow of 30L/s based on the management point Iraia on the Ruakokoputuna Stream (correlations indicate that this represents 90% of MALF in the Tauanui and Tūranganui).

5 Separate the Huangarua River from the Lower Ruamāhanga PNRP limits (upstream of the Ruamāhanga River confluence), retain the existing PNRP allocation of 110L/s and set a minimum flow of 30L/s based on the management point Iraia on the Ruakokoputuna Stream (the headwaters of the Huangarua River)

Recommendation 88

Greater Wellington includes in the PNRP the following minimum flows and allocation amounts for small streams and rivers in the Ruamāhanga whaitua:

1 Retain the current allocation limits and minimum flows in the PNRP for the Papawai and Otukura Streams.

2 Separate the Makahakaha Stream from the Middle Ruamāhanga PNRP limits (upstream of the Ruamāhanga Category A groundwater boundary) and set the allocation limit at the current consented allocation and the minimum flow at 90% of MALF.

3 Separate the Taueru River (upstream of the Kourarau Stream confluence) from the Middle Ruamāhanga PNRP limits, and set the allocation at the current consented allocation and the minimum flow at 65L/s at the upstream confluence.

4 Separate the Whangaehu River from the Upper Ruamāhanga PNRP limits (upstream of the Poterau Stream confluence), and set the allocation at the current consented allocation and the minimum flow at 18L/s at the Whangaehu River at the Waihi management site.

5 For the streams and their tributaries that drain directly to Lake Wairarapa or the South coast, retain the existing default provisions in the PNRP (90% MALF minimum flow, 30% MALF allocation limit).

6 For all other tributary streams of the main stem Ruamāhanga River that are not listed elsewhere (primarily in the Eastern hill and Valley floor streams water allocation management units), separate from the Lower Ruamāhanga PNRP limit and set default allocation limits of 30% MALF and default minimum flows of 90% MALF.

8.4.11 Groundwater allocation

The Committee considers that the groundwater allocation limits in the Ruamāhanga whaitua in the PNRP are set at an appropriate level to ensure that the objectives are met. The Committee has expressed a need to have more robust groundwater monitoring information available in order to better assess groundwater consent applications and the health of groundwater resources. Where there is limited information available on a groundwater resource, the Committee recommends a precautionary approach to assessing and issuing resource consents for that resource.

Recommendation 89

Greater Wellington establishes fit for purpose information about the size and nature of groundwater resources, particularly in the Pirinoa Terraces, Parkvale, Waiōhine and Waingawa parts of the Ruamāhanga whaitua.

Recommendation 90

Greater Wellington includes in the PNRP a policy to ensure that a precautionary approach is taken to the issuing of resource consents for groundwater takes where information on the nature of the resources is limited.

8.5 Implementation of water quantity limits package

8.5.1 New minimum flow requirements

To ensure that the changes to minimum flows are effective, the Committee wishes to see the new minimum flow requirements reflected in resource consents issued to take water. For consents that are expiring in the short term, the new minimum flow requirements can be incorporated as part of the consent renewal process. However, for consents that have recently been issued or that have long durations, the Committee feels it is important that these consents are also subject to the new minimum flow requirements.

Recommendation 91

Greater Wellington implements the new minimum flow levels in resource consents for the Ruamāhanga whaitua using the following methods:

Implementing minimum flow levels in resource consents		
New consents	Existing consents	
	Expire within five years of whaitua plan change	Expire more than five years after whaitua plan change
At consent application	At consent renewal	At consent review, five years after whaitua plan change

Recommendation 92

Greater Wellington uses the review of resource consent conditions (RMA section 129) and water shortage directions (RMA section 329), especially where adverse effects are occurring. This includes recognising that when adverse effects are occurring in a particular river or stream, water shortage directions may be issued to further restrict both consented and permitted water use.

8.5.2 Permitted activities

Permitted activities do not require resource consent for the activities to take place, provided the activities comply with any conditions specified for them. Water users are able to take water for reasonable domestic use and animal drinking water without requiring resource consent, provided the taking or use does not, or is not likely to, have an adverse effect on the environment.[37] The Committee felt that the current provisions of the PNRP do not provide certainty for users that water is available for reasonable domestic use and animal drinking water, nor does it provide guidance to help define or quantify reasonable domestic use and animal drinking water needs.

Recommendation 93

Greater Wellington amends the permitted activity rule, or introduces a new permitted activity rule, in the PNRP to ensure that users have certainty that water can be taken for reasonable domestic use and animal drinking water (provided the taking does not, or is not likely to, have adverse effects on the environment).

Recommendation 94

Greater Wellington identifies in the PNRP, using narrative and (possibly) numbers (unit/volume/day), the meaning of domestic and stock water use, e.g.:

- Water for an individual's reasonable domestic needs is the amount sufficient to provide for hygiene, sanitary and domestic requirements
- Water for the reasonable needs of a person's animals for drinking water is the amount sufficient to provide for the animals' health and welfare.

As well as allowing reasonable domestic and animal drinking water uses, the PNRP allows water users to take an additional 20m^3/day for other uses. The Committee considers a volume of 20m^3/day is hard to justify when, in the Ruamāhanga whaitua, most catchments are at, or in some cases above, full allocation. To ensure that the requirements of the NPS-FM are met and allocation limits are not exceeded, the Committee recommends reducing the amount of water available under the permitted activity rule and ceasing the takes at minimum flows.

Modelling information was used to help quantify the use of water allowed by the RMA and permitted activities in the Ruamāhanga whaitua. To comply with the requirements of the NPS-FM and account for all water used, the Committee felt it was necessary to have better information available on the use of water, particularly with regard to permitted activity and stock and domestic use.

37 Resource Management Act 1991, section 14(3)(b)

Recommendation 95

Greater Wellington amends the relevant permitted activity[38] rule in the PNRP to:

- Limit take to 5m^3/day for surface and groundwater takes, regardless of property size
- Ensure that the water allowed under this permitted activity excludes use for which a person has resource consent i.e. a take under the permitted activity cannot be used to provide an extra 5m^3 of water for irrigation if a person has a consent for irrigation
- Cease permitted take at minimum flows
- Retain the ability for Greater Wellington to require metering
- Ensure that users have the ability to use water under this rule in addition to water available under Recommendation 93

Recommendation 96

Greater Wellington collects better information on water take and use volumes, including for permitted activity takes, in order to provide for more transparent accounting of water use and better management into the future and to ensure that the requirements of the NPS-FM are met. Methods to obtain information on permitted activities could include surveys, modelling and metering of takes where adverse effects are observed or in areas of high demand.

In order to create more resilient communities, the Committee considers that the promotion of rainwater takes is an important option. The use of rainwater tanks, where a reticulated public supply is not an option for households, reduces the number of takes that occur from a surface water body or a groundwater resource. In areas where there is reticulated water supply, rainwater tanks can be used for garden irrigation and, in some cases, non-potable supply to households. This reduces demand on the public supply and the need to treat water to drinking water standards for uses that do not require such a high standard.

Another way to increase the community's resilience is to promote and encourage the efficient use of water within households. Options for this are discussed further in the "Improving efficiency" section below. The NPS-FM also directs regional councils to identify in regional plans methods to encourage the efficient use of water, which include permitted takes as well as consented takes.

Recommendation 97

Greater Wellington introduces a new rule to the PNRP to provide for the use and diversion of rainwater from a roof to a tank as a permitted activity.

Recommendation 98

In order to help meet minimum flow requirements, the Committee strongly supports the use of rainwater tanks and encourages territorial authorities to require rainwater tanks in new subdivisions to promote the efficient use of water.

The taking of water for farm dairy washdown and milk-cooling water is a permitted activity under the PNRP, which allows for 70 litres water per head of stock to be taken. The permitted activity rule also requires all practicable measures for recycling of uncontaminated water to be implemented. The Committee considers it appropriate for this take to continue below the minimum flow. However, the Committee wants to ensure that when a river is at or below its minimum flow level, the water taken for dairy shed use is the absolute minimum amount required to operate the dairy shed safely.

38 Rule R136 of the PNRP.

Recommendation 99

Greater Wellington amends the relevant permitted activity rule[39] in the PNRP to ensure that where takes are from surface water bodies, water may be taken below minimum flow levels but it must be reduced to the minimum amount necessary in order to operate dairy sheds safely.

8.5.3 Improving efficiency

Almost all community water supply in the Ruamāhanga whaitua comes from rivers or groundwater directly linked to rivers, so water sources are dependent on rainfall. Such "run-of-the-river" water supply systems are not particularly resilient to drought, especially when the water supplier is relying on a single source of water, as is the case of Masterton. Supplementary systems have been put in place for some townships (e.g. Carterton) to ensure that adequate water is available in drought conditions, but not all towns have such backup. Most have emergency supplies but these may not be enough to ensure that both water supplies and the environment are protected. The Committee considers that greater water storage capacity is a solution that could be looked at in some places. The efficiency and effectiveness of distribution networks in towns can also be improved (water loss from pipes).

The Committee wishes to see a greater awareness among the urban public of where their water comes from and how water can be efficiently and conserved, especially when flow in the rivers is low.

Recommendation 100

Territorial authorities inform and raise awareness of water conservation in their constituencies, such as on their websites. Information promoting and encouraging water conservation can extend to all sectors of the community, such as households, businesses, industry, agriculture and recreational facilities, including information on re-using greywater.

Recommendation 101

Greater Wellington requires group and community water suppliers to provide water conservation plans as part of resource consent applications to take water, which include how use will be managed at times of water shortage when restrictions are being placed on other consented water uses (e.g. during summer low flow periods).

Recommendation 102

Greater Wellington supports community water suppliers' moves to manage their networks through metering water users (recognising that some already do so).

Recommendation 103

Greater Wellington supports steps by community water suppliers to improve water supply resilience by increasing the number of water sources, including water storage, particularly where a single source is relied on.

Irrigators are adopting more efficient ways of irrigating crops because it is economic to do so. Tools are now available to determine reasonable water use based on daily water balances for a range of crops grown on local soils and in local climates. IrriCalc is an appropriate model to determine reasonable water use in Wairarapa when resource consents are processed, but other models are available and have been used successfully. The Committee considers that the efficiency criteria for irrigation in the PNRP is set at an appropriate level.

The efficient use of water by irrigators is underpinned by information on how much water is being used and where. RMA regulations require water takes greater than 5L/s to be measured and reported. The Committee considers that the use of best practice methods for measuring and reporting on water use is essential to ensuring that water is used efficiently within the whaitua. Best practice methods have been developed by industry (Irrigation New Zealand) through the "Blue Tick Accreditation Programme" and should be supported.

39 Rule R137 of the PNRP

Transferring the take and use of water from one location to another within the same water allocation management unit can be an efficient way to use water, because it provides for increased use of water that has already been allocated. Such transfers mean unused water already allocated can be used where it is most needed. Sharing water is a way of transferring water that is increasing in the Ruamāhanga whaitua. A successful application of transferring water relies on the respective users being in the same water allocation management unit (with the same minimum flows and allocation limits) and having similar or comparable methods for measuring and reporting on their water use. The Committee considers that one way of encouraging water transfers is by making the resource consent process easier for users.

Recommendation 104

Greater Wellington retains the provisions in the PNRP requiring an irrigation application efficiency of 80% in demand conditions that occur in nine out of 10 years, as verified by a field validated model that assesses crop water use, soil water holding capacity, rainfall variability and evapo-transpiration.

Recommendation 105

Greater Wellington and industry reinforce and promote best practice when users are measuring and reporting on their water use. The "Blue Tick Accreditation Programme" championed by Irrigation New Zealand is suitable practice for monitoring and reporting on water takes.

Recommendation 106

Greater Wellington explores options for transferring the taking and use of water (including sharing) from one location to another with the intention of making it easier for users, including by changing consenting status (e.g. from discretionary to controlled activity).

The Committee considers that to date the efficiency of water use in Wairarapa water races has not been adequately assessed. Overall there is a lack of information on the values and biophysical characteristics of water races to assess their efficiency. Anecdotal estimates suggest that only 5% of the water taken from rivers and put into water races is used by surrounding landowners. Much of the remaining water taken is needed to "drive" and maintain flow throughout the water race. Hydrological assessments are complicated at many sites where springs and streams flow into or from the water races. Overall, assessments of the efficiency of water races are needed for individual water races because of their unique influences and physical states. The Committee considers that the impacts of water race takes from rivers can be reduced during times of low flow by limiting the use of water from a water race to the health needs of people and animal drinking water.

Recent work on managed aquifer recharge using the Taratahi and Carrington water races suggests that the water races have a role in recharging aquifers and supporting flows in small streams in the area.[40] The Committee recommends that the way water races are interacting with surrounding groundwater and streams be investigated further when assessing their efficiency.

The Committee also recognises that quality of water deteriorates as it moves down a water race and may impact on the receiving environment. The Committee considers that the quality of water being discharged is another important consideration in the assessment and long-term management of water races in the Ruamāhanga whaitua.

40 See Gyopari 2017, http://www.gw.govt.nz/assets/Managed-Aquifer-Recharge-Exploration-Scenario-Modelling-Summary-Paper-27-July-2017.pdf

Recommendation 107

Greater Wellington works with territorial authorities and landowners to collect information and develop long-term management options (in conjunction with Recommendations 9 and 11) for all water races in the Ruamāhanga whaitua. The information should be collected and assessed in the order that water races come up for consent renewal.

Recommendation 108

Greater Wellington develops a policy indicating that water races requiring resource consent before appropriate long-term management options have been developed shall get short-term consent until the long-term status of the water race is decided. Appropriate information for developing long-term management options for each water race may include, but is not limited to:

- The hydrology of the water race and the interaction with surrounding groundwater and surface water (how much water is in the water race, how much is lost, how much is discharged)
- How much water is used and what it is used for
- Water quality
- Social values, ecological values, mana whenua values, heritage values and economic value
- The efficiency of water use and options for increasing efficiency
- The areas of management overlap and opportunities for better integration (regional consents and district bylaws).

8.5.4 Equity

The Committee is mindful of equity issues between urban and rural uses of water and the role that everyone in the community plays in using water efficiently and with care (e.g. Recommendations 11 and 12). The Committee considers it appropriate to provide industries that use water from a community drinking water supply with time to ensure that they have provisions and mechanisms in place for when water is not available from the community drinking water supply.

Recommendation 109

Greater Wellington amends the date in the relevant provisons of the PNRP for water used by industry from a community drinking water supply to be authorised below the minimum flow, from the existing approach of seven years from the notification of the PNRP to seven years from the date of notification of the Ruamāhanga whaitua plan change.

9. List of recommendations

9 List of recommendations

Recommendations from Chapter 3: Whaitua implementation and Māori

Recommendation 1

Greater Wellington will:

- Support mana whenua as active partners in the management of the Ruamāhanga whaitua
- Work in partnership with mana whenua to develop a management structure that includes a permanent role for hapū/marae at the FMU level
- Work in partnership with mana whenua to establish and resource a kaitiaki support structure that ensures that Ruamāhanga whaitua hapū and marae are enabled to participate fully in FMU and catchment community planning, including:
  - Identification of indicators
  - Monitoring programme
  - Kaitiaki training
  - Development of matāuranga Māori
- Ensure that sufficient funding and dedicated resourcing to enable mana whenua participation are available as soon as the implementation of an FMU/freshwater objective framework begins
- Establish operative roles for mana whenua and hapū/marae in the management of water quality and quantity and river management activities in the Ruamāhanga whaitua
- Support hapū/marae to develop their own indicators for each FMU, including one for Ruamāhanga as a whole. This process to start as soon as the implementation of an FMU/freshwater objective framework begins
- Include hapū/marae indicators in reporting on progress towards meeting freshwater objectives
- Establish and support the process for mana whenua analysis and interpretation of hapū/marae indicators
- Ensure that hapū/marae are informed through multiple channels of any new resource consent applications or renewals of existing consents within their FMUs, and that their input to the consent process is supported
- Encourage and work with mana whenua on the development and inclusion of mātauranga Māori innovative regulatory and non-regulatory approaches to achieving improved water quality
- Include PNRP Schedule B, Ngā Taonga Nui a Kiwa, which specifies the relationship of Wairarapa mana whenua with Te Awa Tapu o Ruamāhanga in the Ruamāhanga whaitua chapter
- Include PNRP Schedule C, Sites of significance to Wairarapa mana whenua within the Ruamāhanga whaitua in a specific schedule in the Ruamāhanga whaitua chapter

Recommendations from Chapter 4: Freshwater objectives for the Ruamāhanga Whaitua

Recommendation 2

The Ruamāhanga whaitua chapter of the PNRP includes all the objectives for mauri, natural form and character and habitat, fish and mahinga kai, sediment, and water quality and aquatic ecosystem health as set out in sections 4.3.1, 4.3.2 and 4.3.3 and Tables 8, 9, 10, 11 and 12 in Appendix 3.

Recommendation 3

The PNRP includes a policy that describes how the periphyton objectives in this WIP will be achieved by the following approaches:

- Achieving the in-stream nutrient criteria for periphyton set out in Table 1
- Achieving the nutrient targets for diffuse sources in Table 2 and for point-source load reductions in Table 4
- Achieving the sediment load reductions in Table 3
- Undertaking extensive riparian planting for the purpose of creating suitable shading for streams to reduce temperatures and photosynthetic active radiation
- Ensuring that any consented in-stream works and activities maintain or restore flushing flows suitable to avoid nuisance periphyton build-up

Recommendation 4

The PNRP includes a policy that describes how the macroinvertebrate community health objectives (indicated by the MCI) in this WIP will be achieved by the following approaches:

- Achieving the in-stream nutrient criteria for the management of periphyton in Table 1
- Achieving the nutrient targets for diffuse-source and point-source loads in Table 2 and Table 4
- Achieving the sediment load reductions in Table 3
- Undertaking extensive riparian planting to reduce water temperatures, reduce fine sediment inputs from stream bank erosion, increase organic matter input (as a food source) and provide habitat for adult insects to colonise from

- Retaining and improving the natural character of water bodies, such as riffles, pools and runs
- Ensuring that any consented in-stream works and activities are managed to minimise the release of deposited fine sediment
- Progressively reducing the use, frequency and extensiveness of mechanical in-stream disturbances in flood protection, drainage and gravel-extraction activities
- Greater Wellington facilitating, and implementing the findings of, research to identify innovative approaches to improve macroinvertebrate community health, as sought by Recommendation 9 of this WIP

Recommendations from Chapter 5: Overarching themes

Recommendation 5

The Ruamāhanga whaitua integrated land and water management system should:

- Seek to be a comprehensive, catchment-wide system that increases ecological and social health and wellbeing as well as improving water use reliability
- Create resilience to the pressures of changing weather systems under climate change
- Empower communities to identify and implement suitable processes and management options in their sub-catchments in order to contribute to the whaitua-wide approach

Recommendation 6

In order to see the effective implementation of all the objectives, limits and policy packages described in this WIP, the Committee supports:

- A programme of actions where rural and urban catchments have a collective responsibility to make change and improve water quality
- A mainly non-regulatory approach to staying within discharge limits for diffuse contaminants
- An emphasis on the use of integrated planning tools (sub-catchment groups, farm planning tools and user groups), supported by education and incentives
- Regulation of point-source discharges of contaminants, land use activities and water takes
- Seeking means for promoting and ensuring continuous improvement and innovation across all sectors and communities
- Collecting and making available information on resource use in the whaitua as a way of enabling better decision-making at all scales

Recommendation 7

Greater Wellington, along with iwi and other partners, develops a coherent FMU implementation framework that results in effective and successful managing to limits at an FMU scale, in both rural and urban environments, to achieve freshwater objectives.

Recommendation 8

Greater Wellington resources the Freshwater Management Unit Implementation Framework sufficiently to support the development of an implementation work programme.

Recommendation 9

Greater Wellington ensures that, in preparing the Ruamāhanga whaitua plan change to the PNRP, it works with communities and the Ruamāhanga Whaitua Committee to ensure that the NPS-FM is appropriately given effect to, including in accordance with the freshwater objectives approach described in NPSFM Policy CA2 and recognition of the 2017 amendments to the NPS-FM in relation to Te Mana o te Wai (NPS-FM Objective AA1) and mātauranga Māori.

Recommendation 10

Innovation in land and water management practice in the Ruamāhanga whaitua should be encouraged and actively facilitated by Greater Wellington, including by:

- Including a policy in the Ruamāhanga whaitua chapter of the PNRP, to be considered in resource consent processes, that recognises the value of innovative practice in the achievement of the objectives of the Ruamāhanga whaitua
- Avoiding resource consent conditions that would prevent trialling of alternative management approaches where change and future proofing are known drivers, while also recognising the need to mitigate risk
- Taking opportunities for ongoing plan changes to provide for innovative practice
- Actively reviewing the effectiveness of the implementation of Greater Wellington operational activities and planning practices and of the recommendations in this WIP in order to promote continued improvement and learning, and to ease bottlenecks
- Ensuring that management processes within Greater Wellington reflect a desire to support innovation. This may include internally rewarding “bright ideas” and establishing/fostering internal practices that support and reward innovation

Recommendation 11

The Committee recommends that:

- GMP be emphasised and innovation fostered as part of every farm plan and by the operational practices of Greater Wellington and territorial authorities in the Ruamāhanga whaitua
- Industry guidelines are the primary source of GMP guidance
- Sub-catchment groups, communities and industry bodies help to develop and apply appropriate GMP specific to the identified requirements of FMUs
- All sectors, including the three waters sector, actively design and progressively implement GMP, not just the primary sector
- As Greater Wellington cannot implement GMP on its own, it develops partnerships with industry, stakeholders and communities for supporting the implementation and adoption of GMP, with the critical role of industry recognised

Recommendation 12

The Committee recommends that water use efficiency be improved among all water users in the Ruamāhanga whaitua, including by:

- Local councils (as suppliers of water) improving water conservation by residential, commercial and industrial users, establishing appropriate demand management strategies during water shortages, improving resilience and reducing demand in issuing of consents for new builds and subdivisions, and investigating opportunities for water re-use
- Group and community water suppliers appropriately managing demand during water shortages and supporting improved resilience of supply
- Irrigation users meeting at least 80% efficiency of application and further improving practices through recognised programmes
- Greater Wellington recognising that exceptions to the "80% efficiency of application" requirement may be appropriate where the financial return from a less efficient water application can be shown to be high (i.e. the water use is highly economically efficient) or where there are meaningful benefits for the environment in a less efficient water use, effectively offsetting the benefits of being 80% efficient
- Greater Wellington and territorial authorities working together to develop long term plans for the management of water races in the Ruamāhanga whaitua that meet the objectives of this WIP and provide for the values of the water bodies and communities
- Increasing education opportunities across types of water users

Recommendation 13

All people of the whaitua need to be involved in efforts to ensure that water is used efficiently and with care, and the burden of change in order to improve water quality should be borne across communities.

Recommendation 14

Greater Wellington establishes as an urgent priority, and actions, a monitoring plan as required by Policy CB1 of the NPS-FM for the monitoring of each FMU.

Recommendation 15

Greater Wellington establishes as an urgent priority, and operates, a freshwater quality accounting system as required by the NPS-FM (Policy CC1). The existing water take accounting system should be upgraded so that it is compatible with the quality system and is accessible to the public and water users.

Recommendation 16

Greater Wellington requires the provision of information on contaminant inputs, sources and/or losses and mitigation activities from resource users, as appropriate to the issues, suitable for the development, operation and use of fit for purpose freshwater accounting.

Recommendation 17

Greater Wellington develops a suitable monitoring programme(s) to establish in-river sediment loads and/or concentrations, including confirming relationships to sediment loads off land and the effectiveness of mitigations. Greater Wellington requires the progress of actions to mitigate sediment loss, including riparian planting and hill-slope erosion practices, to be regularly reported.

Recommendation 18

Greater Wellington establishes a data protocol and reporting plan to ensure that all aggregated data collected is publicly available and provided in a fit for purpose and transparent manner.

Recommendation 19

Greater Wellington supports community monitoring and the wider integration of monitoring results to support FMU outcomes.

Recommendation 20

Greater Wellington undertakes a review of flow monitoring sites in the Ruamāhanga whaitua. Where necessary, to ensure that the network is fit for purpose in implementing this WIP, it makes changes to the network, including the establishment of new sites.

Recommendation 21

Greater Wellington establishes a social and economic monitoring and assessment framework with indicators agreed by the community. Greater Wellington includes social and economic monitoring in the monitoring plan for the Ruamāhanga whaitua.

Recommendation 22

Greater Wellington undertakes a full review of the land and water management system at the next regional plan review (10 years) and makes appropriate changes to the plan.

Recommendations from Chapter 6: Managing rivers and lakes in the Ruamāhanga whaitua

Recommendation 23

Greater Wellington includes in the PNRP a policy or policies that identifies that "river and lake management" is for the health of the water body itself, recognising:

1. That the mauri of the water sustains the mauri of the people
2. The critical importance of providing for the habitat and natural character of rivers and lakes in achieving the Ruamāhanga freshwater objectives
3. The extensiveness and importance of small streams, wetlands and backwaters (in braided rivers) in the Ruamāhanga whaitua in providing healthy native fish habitat and bird habitat and the conditions for mahinga kai species, places and activities to thrive.

Recommendation 24

Greater Wellington includes in the PNRP an overarching policy to improve, across the Ruamāhanga whaitua, riparian vegetation of streams, rivers and lakes for erosion and sediment control, bank stabilisation, temperature management (via shading) and control of algae, and to support other ecosystem health, mahinga kai and indigenous biodiversity outcomes.

Recommendation 25

Greater Wellington plans and implements the Committee's vision for healthy rivers and lakes in the Ruamāhanga whaitua by:

1. Ensuring that the river and lake management functions of the Council achieve freshwater objectives and targets in each FMU
2. Working with mana whenua and communities in co-creating what river and lake management for the health of the river looks like within each FMU.

Recommendation 26

Greater Wellington identifies and implements methods for further enabling mana whenua participation in land and water resource management, including with papa kāinga, marae and hapū (as appropriate), to ensure that the values of mana whenua are appropriately reflected in freshwater planning and regulatory processes and in flood protection strategic and operational planning and implementation.

Recommendation 27

Greater Wellington includes in the PNRP a policy promoting the restoration of rivers, lakes and wetlands to achieve the Ruamāhanga freshwater objectives, which supports activities in the beds of rivers, lakes and wetlands when these activities are undertaken for such restoration purposes.[41]

Recommendation 28

Greater Wellington reviews current planning and implementation activities relevant to the health of lakes and rivers in order to:

1. Identify any changes necessary to planning, governance, investment and practice to deliver the Ruamāhanga whaitua objectives through river and lake management
2. Identify new multidisciplinary systems to deliver integrated river and catchment management
3. Progressively implement the findings of this review work.

"Activities" could include institutional delivery structures, the alignment of future relevant land and water programmes and investments, and the application of GMP in operational and capital expenditure works.

41 Note the connection to Recommendation 9 in relation to consenting processes recognising the value of innovative practice

Recommendation 29

Greater Wellington seeks and takes opportunities to enhance the natural form and character, aquatic ecosystem health and mahinga kai of rivers, streams, lakes and wetlands across the Ruamāhanga whaitua, including by:

1 Aligning the planning and operation of flood management activities (e.g. floodplain planning) with the Ruamāhanga whaitua objectives and policies

2 Identifying and implementing management options to enhance natural character and to achieve the Ruamāhanga freshwater objectives when undertaking operational works (e.g. willow removal and gravel extraction)

3 Aligning and supporting farm planning and farm plan implementation with the Ruamāhanga whaitua objectives

4 Investing in riparian planting for shading and stream bank erosion management and in wetland restoration[42]

5 Supporting and undertaking the restoration of native fish spawning habitat, including in water bodies affected by flood management activities.

Recommendation 30

Greater Wellington includes a policy in the PNRP to restore the health of Wairarapa Moana by 2080, including to provide for mahinga kai, support native fish populations and restore the health of the Wairarapa Moana wetlands.

Recommendation 31

Greater Wellington commits to the restoration of the health of Wairarapa Moana, including Lake Wairarapa and Lake Ōnoke, by undertaking research, investigations and experiments in management approaches, strategic planning and changes to operational activities to progressively improve the lake health and to reach the objectives of this WIP by 2080 at the latest.

Recommendation 32

Greater Wellington undertakes feasibility studies of "in-lake" management options for the purposes of providing for the community values of Wairarapa Moana and achieving the freshwater objectives identified in this WIP. Options to investigate include:

- Rerouting the Ruamāhanga River into Lake Wairarapa, particularly at flows below the median flow, with higher flows bypassing the lake
- Alternative management regimes for the lake level gates at Lake Wairarapa
- Alternative management regimes for Lake Ōnoke, including in relation to the timing, location and operation of lake mouth openings
- Experimenting with alternative management options, such as temporarily holding Lake Wairarapa at higher levels than current practice, as a means of testing proof of concepts for potential broader application

All such feasibility studies of in-lake management options should be completed within 10 years of the issuing of this WIP (i.e. by 2028). Experimentation should ensure an appropriate consideration of the WCO. Effective and early engagement with the Ruamāhanga whaitua community and broader public as part of any such feasibility work will help to underpin successful experimentation and the robust identification of management choices for future implementation.

Recommendation 33

Greater Wellington investigates further options for restoring the health of Wairarapa Moana, including restoring the Ruamāhanga River flow into Lake Wairarapa, including to:

- Mitigate the impacts of wave action
- Reduce the re-suspension of sediments in order to improve clarity
- Create conditions suitable for macrophytes to survive and thrive
- Remove nutrients and sediments
- Restore the health of mahinga kai species
- Enhance the health of wetlands

42 Note the connection to Recommendation 38 in relation to sediment targets from managing stream bank erosion

Recommendation 34

Greater Wellington recognises and supports research being undertaken by external groups, mana whenua and the whaitua community on means to improve the health of Lake Wairarapa and Lake Ōnoke, and actively considers the application of new knowledge to the management of activities affecting the lakes, including through planning, consent practice and operational management practices.

Recommendation 35

Greater Wellington actively informs and works with external agencies, including the Department of Conservation, to link the management of nonnative fisheries and the commercial harvest of native fish species with achieving the Ruamāhanga whaitua objectives and to deliver on the needs of catchment communities.[43]

Recommendations from Chapter 7: Managing contaminants in the Ruamāhanga whaitua – discharges and land uses

Recommendation 36

Greater Wellington sets water quality limits and targets for nutrients and sediment loads as rules in the PNRP for each FMU within the Ruamāhanga whaitua, in accordance with Tables 2 and 3. Targets should be expressed as percentage reductions (from the limits) in the Ruamāhanga whaitua plan change.

Recommendation 37

Greater Wellington sets water quality limits and targets for *E. coli* concentrations as rules in the PNRP for each FMU within the Ruamāhanga whaitua, in accordance with the four attribute states in Table 8 in Appendix 3.

Recommendation 38

Progressively reduce sediment loads in the five FMUs producing the greatest sediment load off nonnative land, as modelled under the baseline (current state), in accordance with the targets (to be achieved by 2050) set in Table 3. These "top 5" FMUs are:

- Taueru
- Huangarua
- Eastern hill streams
- Whangaehu
- Kopuaranga

Recommendation 39

As a priority for implementation in the "top 5" FMUs, Greater Wellington works with communities to establish and implement farm plans on properties where they do not presently exist.

Recommendation 40

Progressively reduce sediment loss from net bank erosion in all non-"top 5" FMUs in the Ruamāhanga whaitua in accordance with the targets (to be achieved by 2050) set in Table 3.

Recommendation 41

Greater Wellington reviews progress in achieving the targets (set in Table 3) 10 years after the notification of the Ruamāhanga whaitua plan change, including describing the extent of mitigation work undertaken and the modelled and/or monitored impacts on water quality in rivers, streams and lakes in the whaitua.

Recommendation 42

Across the whaitua, Greater Wellington supports and drives improved management of critical source areas and high-risk land uses in line with GMP, including through working with industry partners.

Recommendation 43

In the "top 5" FMUs, Greater Wellington undertakes further sub-FMU scale planning with local communities to establish the locations of highest priority in which to undertake sediment mitigation works in order to achieve the targets in Table 3.

Recommendation 44

Greater Wellington aligns the planning, funding and support of sediment mitigation activities, including both riparian restoration and hill-slope erosion and sediment control, with the identified priority areas and targets and the suitable mitigation approaches.

Recommendation 45

Greater Wellington promotes the uptake of sediment mitigation through connections with new research into sediment mitigation measures, practices and adoption mechanisms, and Greater Wellington, industry and community extension services to enable the uptake of constantly improving practice.

43 See also Recommendation 61

Recommendation 46

Greater Wellington reviews the need for a nutrient allocation regime 10 years after the Ruamāhanga whaitua plan change, or by 2029. NOTE: Grandparenting would not be considered a suitable allocation regime if one were to be implemented.

Recommendation 47

Greater Wellington and industry promote and support the implementation of farm planning as a primary tool of management at a farm scale.

Recommendation 48

Greater Wellington further incentivises and promotes the adoption of farm planning and the activation and review of existing farm plans.

Recommendation 49

Greater Wellington and iwi partners and industry work together to promote and implement GMP in both rural and urban contexts. Appropriate GMP for the Ruamāhanga catchment should be defined.

Recommendation 50

GMP should be emphasised as part of farm planning.

Recommendation 51

Greater Wellington reviews the land use rules structure including for break-feeding, cultivation, and livestock exclusion, to ensure that the requirements are clear to resource users when resource consent is required.

Recommendation 52

Greater Wellington actively promotes and enforces the requirements of the permitted activity rules for break-feeding, cultivation and livestock exclusion.

Recommendation 53

Greater Wellington provides a new rule for land use changes where a new land use results in an increase in contaminant load as a discretionary activity in the PNRP. A land use change that results in a decrease in contaminant load shall be a permitted activity.

Recommendation 54

Greater Wellington expands its support for extensive, whaitua-wide riparian planting for the management of stream bank erosion and for in-stream benefits (e.g. shade to reduce periphyton), including through:

- Priority in farm planning design and implementation
- Increasing funding for riparian planting, as well as improving access to and awareness of the funds
- Producing plants (e.g. at Akura nursery) or assisting communities to produce plants fit for such a programme

Recommendation 55

Greater Wellington includes a rule in the PNRP for wastewater discharges to meet the target allocations for nutrients in Table 4. Target allocations are to be met by 2040.

Recommendation 56

Greater Wellington ensures that the nutrient allocations for wastewater discharges in Table 4 are reviewed and changed appropriately when plan reviews occur, including to recognise ongoing changes to and improvements in GMP.

Recommendation 57

Greater Wellington works with territorial authorities to ensure that wastewater is discharged appropriately to land by 2040, recognising that direct discharges to water may occasionally be acceptable but only in exceptional circumstances and only at high flows (e.g. three times the median flow).

Recommendation 58

Greater Wellington works with territorial authorities on a suitable permitted activity rule for the irrigation of wastewater to farm land. This should include conditions on the standard of the discharged effluent, discharge rates and timing, and any restrictions on where this irrigation should occur.

Recommendation 59

Greater Wellington introduces discharge standards for all point-source discharges.

Recommendation 60

Urban stormwater is managed in accordance with GMP and progressive improvement and the PNRP policies and rules.

Recommendation 61

Greater Wellington, along with iwi and other partners, supports the formation and coordination of catchment communities in both urban and rural environments.

Recommendation 62

Greater Wellington supports and contributes to the continued development of the Wairarapa Catchment Communities/Pūkaha to Palliser project, which aims to bring catchment community groups together and "make it easier" for them to achieve desired outcomes for their communities, whether they are environmental, social, cultural or economic outcomes.

Recommendation 63

Greater Wellington supports and contributes to the development of a multi-agency delivery platform that will effectively respond and deliver resources effectively and efficiently to the needs of catchment communities. This agency coordinated response will enable communities to make changes ahead of regulation and support innovation.

Recommendation 64

Greater Wellington writes a compliance plan with the community for compliance with rules in the PNRP, including targets and limits.

Recommendation 65

Greater Wellington implements good compliance systems e.g. strategic compliance across activities (prioritising compliance on higher risk activities).

Recommendation 66

Greater Wellington undertakes a prioritisation exercise to determine the further investigations that need to be completed in the catchment to better understand effects and/or to establish causality to inform future management. The priorities identified in the following recommendation should also be included.

Recommendation 67

The following investigations should be considered priorities as part of the implementation of Recommendation 66:

- Establish sedimentation rates (and gather other information on the impacts of sediment on lake health and river health) for Lake Ōnoke, including to establish a relationship between catchment loads and lake health
- Complete a further investigation, including via modelling, of sediment loads lost from land use activities, including to identify how loads are changing over time
- Complete a further investigation of contaminant pathways through groundwater, including soil vulnerability and attenuation processes

Recommendation 68

Greater Wellington advocates for, and actively seeks out, alternative funding models for mitigation measures in order to promote successful and extensive implementation.

Recommendation 69

Greater Wellington should actively seek capital from central government and promote external capital investment, such as carbon offsetting programmes, in assisting landowners in extensive uptake of sediment mitigations across the whaitua.

Recommendations from Chapter 8: Flows and water allocation in the Ruamāhanga whaitua

Recommendation 70

To improve water supply reliability, the Ruamāhanga whaitua integrated land and water management system should:

- Integrate multiple management options for water retention, including attenuation, storage and harvesting at a range of scales, and efficient use in the long and short terms, rather than be dependent on any one mechanism
- Actively promote attenuation of water in soils, wetlands, lakes and groundwater systems across the catchment
- Ensure an equitable approach to improved water storage and water use efficiency by both rural and urban users

Recommendation 71

Greater Wellington includes in the PNRP a policy that recognises the importance of the role of attenuation of water in soils, wetlands and lakes and their riparian margins in the whaitua to support groundwater recharge and wetland restoration and help build resilience in communities.

Recommendation 72

Greater Wellington includes in the PNRP a policy that recognises the benefits of multiple mechanisms (such as storage, harvesting, attenuation and aquifer recharge) that increase resilience and water reliability of supply.

Recommendation 73

Greater Wellington includes in the PNRP a policy, or amends existing policy, to provide for circumstances where water may be taken at higher flows for purposes wider than storage e.g. aquifer recharge.

Recommendation 74

Greater Wellington further investigates integrated solutions to water reliability. These should include integrating storage, harvesting, attenuation and managed aquifer recharge, and facilitate pilot projects to prove feasibility.

Recommendation 75

Greater Wellington requires users of water to manage their take and use in a more equitable manner and to ensure GMP, including to:

- Seek efficiency gains when consents are renewed for all water use activities
- Promote small-scale storage on urban and rural properties in order to increase resilience and to encourage everyone to take part in improving water use efficiency
- Require takes from directly connected groundwater to reduce and cease at times of low flows in rivers in the same way that surface water takes are managed
- Require community supply takes to do more to reduce take at minimum flows, while protecting the ability to take water for people's health needs
- Reduce water race takes at minimum flows to only the water required to provide for people's domestic needs and stock drinking needs

Recommendation 76

Greater Wellington investigates policy options in the PNRP to provide for "non-consumptive" takes. Consideration will need to be given to:

- The volume of the take and discharge
- Ensuring that the efficiency of the water use is maximised in order to return a similar amount of water to the source
- Maintaining the quality of the discharge in relation to the quality of the source water
- The distance between the abstraction and discharge points
- Any net ecological benefits of the use of the water

The efficiency and quality requirements of this policy would come into effect five years after the plan change. Non-consumptive takes do not include irrigation.

Recommendation 77

Greater Wellington includes in the PNRP the following water allocation limits for the Kopuaranga River:

1 Increase the minimum flow from 270L/s to 280L/s.

2 Cap the amount of water available to be allocated through consents at the existing consented use. (Existing consented use at June 2018 is 150L/s)

Recommendation 78

Greater Wellington includes in the PNRP the following water allocation limits for the Waipoua River:

1 Increase the minimum flow from 250L/s to 340L/s over time as follows:

   a Five years after plan change (or in 2024), increase the minimum flow to 300L/s.

   b 10 years after plan change (or in 2029), increase the minimum flow to 340L/s.

3 Retain the current step down level at which takes shall reduce at 300L/s until the first minimum flow increase in 1 above occurs.

4 Cap the amount of water available to be allocated through consents at the existing consented use. (Existing consented use at June 2018 is 116L/s)

Recommendation 79

Greater Wellington includes in the PNRP the following water allocation limits for the Waingawa River:

1 Remove the existing PNRP "lower" minimum flow of 1,100L/s.

2 Increase the minimum flow to the existing PNRP[44] "higher" minimum flow of 1,700L/s over 10 years as follows:

   a Five years after plan change (or in 2024), increase the minimum flow to 1,400L/s for all takes for community and group water supplies and water races.

   b 10 years after plan change (or in 2029), increase the minimum flow to 1,700L/s for all takes.

3 Retain the efficient use and unused water policies in the PNRP to work towards reducing the consented allocation in line with the allocation amount specified in the PNRP (920L/s).

Recommendation 80

Greater Wellington combines the Upper Ruamāhanga and Middle Ruamāhanga catchment management units into a single water allocation management unit through a change to the PNRP.

Recommendation 81

Greater Wellington includes in the PNRP the following water allocation limits for the Upper/Middle Ruamāhanga catchment:

1 Increase the minimum flow level from 2,400L/s to 3,250L/s over time as follows:

   a No change for 10 years.

   b 10 years after plan change (or in 2029), increase to 2,700L/s.

   c 15 years after plan change (or in 2034), increase to 2,970L/s.

   d 20 years after plan change (or in 2039), increase to 3,250L/s.

5 Retain the current stepdown level at which takes shall reduce at 2,700L/s until the first minimum flow increase in 1 above occurs.

6 Cap the amount of water available to be allocated through consents at the existing consented use. (Existing consented use at June 2018 is 1,910L/s.)

Recommendation 82

Greater Wellington includes in the PNRP the following water allocation limits for the Waiōhine River:

1 Remove the existing PNRP "lower" minimum flow of 2,300L/s.

2 Retain the "higher" minimum flow level of 3,040L/s.

3 Cap the amount of water available to be allocated through consents at the existing consented use. (Existing consented use at June 2018 is 950L/s).

Recommendation 83

Greater Wellington includes in the PNRP the following water allocation limits for the Tauherenīkau River:

1 Remove the existing "lower" PNRP minimum flow of 1,100L/s.

2 Retain the existing "higher" PNRP minimum flow of 1,300L/s.

3 Cap the amount of water available to be allocated through consents at the existing consented use. (Existing consented use at June 2018 is 234L/s)

Recommendation 84

For the Lower Ruamāhanga catchment, Greater Wellington retains the existing PNRP minimum flow and allocation amounts.

Recommendation 85

Greater Wellington changes the provisions of the PNRP to ensure that in 10 years' time (or in 2029) those takes classified as Category A groundwater must cease their take when the nearby river or stream reaches its minimum flow.

Recommendation 86

Greater Wellington undertakes further investigations to ensure that those groundwater takes classified as Category A do have a direct connection with nearby river, stream or lake.

44 Schedule R of the PNRP

Recommendation 87

Greater Wellington undertakes targeted investigations into the Parkvale Stream, Booths Creek, Mākōura Stream, Kuripuni Stream and Tauanui and Tūranganui Rivers to determine the specific minimum flow requirements and allocation limits for each river or stream, within three years of the plan notification or by 2022.

In the interim, Greater Wellington includes in the PNRP the following minimum flows and allocation limits:

1 For Parkvale Stream and Booths Creek, retain the current allocation limits and minimum flows in the PNRP.

2 Separate the Mākōura and Kuripuni Streams from the Upper Ruamāhanga limits currently in the PNRP and set allocation limits at the current consented allocation and minimum flow at 100L/s based on the management point Colombo Road on the Mākōura Stream.

3 Separate the Tauanui River from the Lower Ruamāhanga limits currently in the PNRP, and set an allocation limit at the current consented allocation and minimum flow of 30L/s based on the management point Iraia on the Ruakokoputuna Stream (correlations indicate that this represents 90% of MALF in the Tauanui and Tūranganui).

4 Set the allocation limit for the Tūranganui River at the current consented allocation and set a minimum flow of 30L/s based on the management point Iraia on the Ruakokoputuna Stream (correlations indicate that this represents 90% of MALF in the Tauanui and Tūranganui).

5 Separate the Huangarua River from the Lower Ruamāhanga PNRP limits (upstream of the Ruamāhanga River confluence), retain the existing PNRP allocation of 110L/s and set a minimum flow of 30L/s based on the management point Iraia on the Ruakokoputuna Stream (the headwaters of the Huangarua River).

Recommendation 88

Greater Wellington includes in the PNRP the following minimum flows and allocation amounts for small streams and rivers in the Ruamāhanga whaitua:

1 Retain the current allocation limits and minimum flows in the PNRP for the Papawai and Otukura Streams.

2 Separate the Makahakaha Stream from the Middle Ruamāhanga PNRP limits (upstream of the Ruamāhanga Category A groundwater boundary) and set the allocation limit at the current consented allocation and the minimum flow at 90% of MALF.

3 Separate the Taueru River (upstream of the Kourarau Stream confluence) from the Middle Ruamāhanga PNRP limits, and set the allocation at the current consented allocation and the minimum flow at 65L/s at the upstream confluence.

4 Separate the Whangaehu River from the Upper Ruamāhanga PNRP limits (upstream of the Poterau Stream confluence), and set the allocation at the current consented allocation and the minimum flow at 18L/s at the Whangaehu River at the Waihi management site.

5 For the streams and their tributaries that drain directly to Lake Wairarapa or the South coast, retain the existing default provisions in the PNRP (90% MALF minimum flow, 30% MALF allocation limit).

6 For all other tributary streams of the main stem Ruamāhanga River that are not listed elsewhere (primarily in the Eastern hill and Valley floor streams water allocation management units), separate from the Lower Ruamāhanga PNRP limit and set default allocation limits of 30% MALF and default minimum flows of 90% MALF.

Recommendation 89

Greater Wellington establishes fit for purpose information about the size and nature of groundwater resources, particularly in the Pirinoa Terraces, Parkvale, Waiōhine and Waingawa parts of the Ruamāhanga whaitua.

Recommendation 90

Greater Wellington includes in the PNRP a policy to ensure that a precautionary approach is taken to the issuing of resource consents for groundwater takes where information on the nature of the resources is limited.

Recommendation 91

Greater Wellington implements the new minimum flow levels in resource consents for the Ruamāhanga whaitua using the following methods:

Implementing minimum flow levels in resource consents		
New consents	Existing consents	
	Expire within five years of whaitua plan change	Expire more than five years after whaitua plan change
At consent application	At consent renewal	At consent review, five years after whaitua plan change

Recommendation 92

Greater Wellington uses the review of resource consent conditions (RMA section 129) and water shortage directions (RMA section 329), especially where adverse effects are occurring. This includes recognising that when adverse effects are occurring in a particular river or stream, water shortage directions may be issued to further restrict both consented and permitted water use.

Recommendation 93

Greater Wellington amends the permitted activity rule, or introduces a new permitted activity rule, in the PNRP to ensure that users have certainty that water can be taken for reasonable domestic use and animal drinking water (provided the taking does not, or is not likely to, have adverse effects on the environment).

Recommendation 94

Greater Wellington identifies in the PNRP, using narrative and (possibly) numbers (unit/volume/day), the meaning of domestic and stock water use, e.g.:

- Water for an individual's reasonable domestic needs is the amount sufficient to provide for hygiene, sanitary and domestic requirements
- Water for the reasonable needs of a person's animals for drinking water is the amount sufficient to provide for the animals' health and welfare

Recommendation 95

Greater Wellington amends the relevant permitted activity[45] rule in the PNRP to:

- Limit take to 5m^3/day for surface and groundwater takes, regardless of property size
- Ensure that the water allowed under this permitted activity excludes use for which a person has resource consent i.e. a take under the permitted activity cannot be used to provide an extra 5m^3 of water for irrigation if a person has a consent for irrigation
- Cease permitted take at minimum flows
- Retain the ability for Greater Wellington to require metering
- Ensure that users have the ability to use water under this rule in addition to water available under Recommendation 93

Recommendation 96

Greater Wellington collects better information on water take and use volumes, including for permitted activity takes, in order to provide for more transparent accounting of water use and better management into the future and to ensure that the requirements of the NPS-FM are met. Methods to obtain information on permitted activities could include surveys, modelling and metering of takes where adverse effects are observed or in areas of high demand.

Recommendation 97

Greater Wellington introduces a new rule to the PNRP to provide for the use and diversion of rainwater from a roof to a tank as a permitted activity.

Recommendation 98

In order to help meet minimum flow requirements, the Committee strongly supports the use of rainwater tanks and encourages territorial authorities to require rainwater tanks in new subdivisions to promote the efficient use of water.

Recommendation 99

Greater Wellington amends the relevant permitted activity rule[46] in the PNRP to ensure that where takes are from surface water bodies, water may be taken below minimum flow levels but it must be reduced to the minimum amount necessary in order to operate dairy sheds safely.

45 Rule R136 of the PNRP

46 Rule R137 of the PNRP

Recommendation 100

Territorial authorities inform and raise awareness of water conservation in their constituencies, such as on their websites. Information promoting and encouraging water conservation can extend to all sectors of the community, such as households, businesses, industry, agriculture and recreational facilities, including information on re-using greywater.

Recommendation 101

Greater Wellington requires group and community water suppliers to provide water conservation plans as part of resource consent applications to take water, which include how use will be managed at times of water shortage when restrictions are being placed on other consented water uses (e.g. during summer low flow periods).

Recommendation 102

Greater Wellington supports community water suppliers' moves to manage their networks through metering water users (recognising that some already do so).

Recommendation 103

Greater Wellington supports steps by community water suppliers to improve water supply resilience by increasing the number of water sources, including water storage, particularly where a single source is relied on.

Recommendation 104

Greater Wellington retains the provisions in the PNRP requiring an irrigation application efficiency of 80% in demand conditions that occur in nine out of 10 years, as verified by a field validated model that assesses crop water use, soil water holding capacity, rainfall variability and evapo-transpiration.

Recommendation 105

Greater Wellington and industry reinforce and promote best practice when users are measuring and reporting on their water use. The "Blue Tick Accreditation Programme" championed by Irrigation New Zealand is suitable practice for monitoring and reporting on water takes.

Recommendation 106

Greater Wellington explores options for transferring the taking and use of water (including sharing) from one location to another with the intention of making it easier for users, including by changing consenting status (e.g. from discretionary to controlled activity)

Recommendation 107

Greater Wellington works with territorial authorities and landowners to collect information and develop long-term management options (in conjunction with Recommendations 9 and 11) for all water races in the Ruamāhanga whaitua. The information should be collected and assessed in the order that water races come up for consent renewal.

Recommendation 108

Greater Wellington develops a policy indicating that water races requiring resource consent before appropriate long-term management options have been developed shall get short-term consent until the long-term status of the water race is decided. Appropriate information for developing long-term management options for each water race may include, but is not limited to:

- The hydrology of the water race and the interaction with surrounding groundwater and surface water (how much water is in the water race, how much is lost, how much is discharged)
- How much water is used and what it is used for
- Water quality
- Social values, ecological values, mana whenua values, heritage values and economic value
- The efficiency of water use and options for increasing efficiency
- The areas of management overlap and opportunities for better integration (regional consents and district bylaws)

Recommendation 109

Greater Wellington amends the date in the relevant provisons of the PNRP for water used by industry from a community drinking water supply to be authorised below the minimum flow, from the existing approach of seven years from the notification of the PNRP to seven years from the date of notification of the Ruamāhanga whaitua plan change.

10. Appendices

Appendix 1: Summary of current state and freshwater objectives for rivers and lakes in the Ruamāhanga whaitua

Table 5: Summary of water quality, algae and macroinvertebrate current state and freshwater objectives for rivers in the Ruamāhanga whaitua (following page).

Current states were established using monitoring data, modelled data from the Collaborative Modelling Project (CMP), or expert advice and best knowledge where there was neither monitoring data nor a CMP modelling output point. FMUs with existing monitoring points and that therefore use monitoring data are shown in the "current state" column as the letter of the band; FMUs with CMP modelling output points only are shown with the letter of the band and an asterisk (*); FMUs where expert advice was used to establish the likely current state (and therefore inform the objective setting) are shown with a hyphen (-).

Table 5: Summary of water quality, algae and macroinvertebrate current state and freshwater objectives for rivers in the Ruamāhanga whaitua

River	NOF attributes								Non-NOF attributes		When by?	FMU group
	E. coli	*E. coli*	Periphyton	Periphyton	Ammonia toxicity	Ammonia toxicity	Nitrate toxicity	Nitrate toxicity	MCI	MCI		
	Current state	Objective	Current state	Objective	Current state	Objective	Current state	Objective	Current state	Objective		
Tauanui River	D*	A	C/D*	B	A*	A	A*	A	Fair*	Good	2040	Aorangi rivers
Tūranganui River	B*	B	C/D*	B	A*	A	A*	A	Fair*	Good	2040	Aorangi rivers
Taueru River	C	C	D*	C	A	A	B	A	Good	Good	2040	Eastern hill rivers
Makahakaha Stream	A*	A	-	B	A*	A	B*	A	Fair*	Good	2040 (periphyton 2030)	Eastern hill rivers
Huangarua River	B	B	C	B	A	A	A	A	Fair	Good	2080	Eastern hill rivers
Eastern hill streams	-	B	-	B	-	A	-	A	-	Fair	Maintain	Eastern hill streams group
Ruamāhanga - Wardells	C*	C	B*	B	B*	A	A*	A	Fair*	Fair	2040	Main stem Ruamāhanga River
Ruamāhanga - Gladstone Bridge	D	C	B	B	B	A	A	A	Fair*	Fair	2040	Main stem Ruamāhanga River
Ruamāhanga - Waihenga	A	A	B	B	B*	A	A*	A	Fair*	Fair	2040	Main stem Ruamāhanga River
Ruamāhanga - Pukio	B	B	-	B	A*	A	A*	A	Good*	Good	Maintain	Main stem Ruamāhanga River
Ruamāhanga - upstream of confluence with Lake Wai outlet	B*	B	-	B	A*	A	A*	A	Fair*	Fair	Maintain	Main stem Ruamāhanga River
Kopuaranga River	D	C	D	C	A	A	A	A	Fair	Good	2040	Northern rivers
Whangaehu River	D	C	-	C	A	A	A	A	Fair*	Good	2040	Northern rivers
Parkvale Stream	E	C	B	B	B	A	B	A	Fair*	Good	2040	Valley floor streams group
Otukura Stream	D*	C	-	B	B*	A	B*	A	-	Fair	2040	Valley floor streams group
Valley floor streams	-	C	-	B	-	A	-	A	-	Good	2040	Valley floor streams group
Upper Ruamāhanga River	D	C	A	A	A	A	A	A	Fair	Good	2040	Western hill rivers
Waipoua River	B	A	B*	A	A	A	B	A	Fair	Good	2040	Western hill rivers
Waingawa River	A	A	A	A	A	A	A	A	Good	Good	Maintain	Western hill rivers
Mangatarere Stream	D	B	C	B, then A	B	B (top of band)	B	A	Fair	Good	2040 (2080 for MCI)	Western hill rivers
Waiōhine River	A	A	A	A	A	A	A	A	Fair	Good	2080	Western hill rivers
Tauherenīkau River	A	A	A*	A	A	A	A	A	Fair	Good	2040	Western hill rivers
Western lake streams	-	A	-	A	-	A	-	A	-	Good or better	Maintain	Western hill rivers
South coast streams	-	A	-	A	-	A	-	A	-	Fair	Maintain	South coast streams group

Table 6: Summary of water quality, algae, macrophyte and trophic level current state and freshwater objectives for lakes in the Ruamāhanga whaitua

Lake	NOF attributes										Non-NOF attributes						When by?	FMU group
	E.coli	E.coli	Phyto-plankton	Phyto-plankton	Total nitro-gen	Total nitro-gen	Total phos-phorus	Total phospho-rus	Am-monia toxic-ity	Am-monia toxic-ity	Trophic level index	Trophic level index	Total sus-pended sedi-ment	Total sus-pended sedi-ment	Macro-phytes	Macro-phytes		
	Now	Objec-tive	Now	Objective	Now	Objec-tive	Now	Objec-tive	Now	Objec-tive	Now	Objec-tive	Now	Objec-tive	Now	Objective		
Lake Wairarapa	A	A	D	C	C	C	D	C	A	A	Very poor	Poor	Poor	Fair	D	C	2080	Lakes
Lake Ōnoke	B/C	A	B	B	C	B	B	B	A	A	Poor	Average	Poor	Fair	D	C	2040	Lakes

Appendix 2: Water quantity limits for the major quantity FMUs in the Ruamāhanga whaitua

Table 7: Water quantity limits for the major quantity freshwater management units in the Ruamāhanga whaitua

Limits would take affect from the time of plan notification, with exceptions for the Waipoua and Upper Ruamāhanga (see footnotes).

“Health needs of people” refers to the amount of water needed to provide adequately for people’s hygiene, sanitary and domestic requirements.

47 The requirement to cease take will not take effect for 10 years

48 The requirement to cease take will not take effect for 10 years

49 The Waipoua River minimum flow will be progressively implemented over 10 years

50 The Upper/Middle Ruamāhanga River extends from the headwaters to the confluence with the Waiōhine River

51 The Upper Ruamāhanga River increase in minimum flow will be progressively implemented over 20 years

Table 7: Water quantity limits for the major quantity freshwater management units in the Ruamāhanga whaitua

Water quantity FMU	Objective (habitat protection)	Limits										
			Minimum flow 1					Minimum flow 2				
		Allocation (L/s)	Flow (L/s)	What happens to different types of consented takes at these flows?				Flow (L/s)	What happens to different types of consented takes at these flows?			
				Surface water takes (excluding community supply and water races)	Category A groundwater takes (excluding community supply and water races)[47]	Community supply takes	Water races		Surface water takes (excluding community supply and water races)	Category A groundwater takes (excluding community supply and water races)[48]	Community supply takes	Water races
Kopuaranga	90%	150	280	Cease	Cease							
Waipoua[49]	90%	130	340	Cease	Cease	Reduce to health needs of people						
Waingawa	90%	1,200	1,900	Reduce by 50%	Reduce by 50%	No action	No action	1,700	Cease	Cease	Reduce to health needs of people	Reduce to health needs of people and stock drinking needs
Upper/Middle Ruamāhanga [50, 51]	90%	1,925	3,250	Cease	Cease		Reduce to health needs of people and stock drinking needs					
Mangatarere [top row is upper catchment and bottom row is lower catchment]	90%	475	330	Reduce by 50%	Reduce by 50%		Reduce	240	Cease	Cease	Reduce to health needs of people	Reduce to health needs of people and stock drinking needs
	90%		270	Reduce by 50%	Reduce by 50%	No action	No action	200	Cease	Cease	Reduce to health needs of people	Reduce to health needs of people and stock drinking needs
Waiōhine	90%	1,005	3,040	Cease	Cease	Reduce to health needs of people	Reduce to health needs of people and stock drinking needs					
Lower Ruamāhanga	90%	2,445	9,200	Reduce by 50%	Reduce by 50%	No action		8,500	Cease	Cease	Reduce to health needs of people	
Tauherenīkau	90%	235	1,300	Cease	Cease		Reduce to health needs of people and stock drinking needs					

Appendix 3: Numeric freshwater objectives for river and lake FMUs in the Ruamāhanga whaitua

Table 8: Numeric freshwater objectives for river freshwater management units: *E. coli*

See the note to Table 5 for interpretation. Links to the relevant technical reports used to translate the Committee's work into numeric objectives are available here: http://www.gw.govt.nz/ruamahanga-technical-reports.

FMU group	River freshwater management unit	Monitoring point	NOF attributes						Freshwater objectives to be met by?
			E. coli						
			Current state	Freshwater objective					
			NOF band	NOF band	% exceedances		Concentration (mg/L) ≤		
					≥540cfu/100mL	≥260cfu/100mL	Median	95th percentile	
Aorangi rivers	Tauanui River	TBC	D*	A	<5%	<20%	127	505	2040
	Tūranganui River	TBC	B*	B	5-10%	20-30%	66	565	Maintain
Eastern hill rivers	Taueru River	Taueru River at Gladstone Bridge	C	C	10-20%	30-34%	99	1,171	Maintain
	Makahakaha Stream	TBC	A*	A	<5%	<20%	51	100	Maintain
	Huangarua River	Huangarua River at Ponatahi Bridge	B	B	5-10%	20-30%	68	921	Maintain
Eastern hill streams	Eastern hill streams	TBC	-	B	5-10%	20-30%	68	921	Maintain
Main stem Ruamāhanga River	Ruamāhanga – Wardells	Ruamāhanga at Wardells	C*	C	10-20%	30-34%	105	994	Maintain
	Ruamāhanga – Gladstone Bridge	Ruamāhanga at Gladstone Bridge	D	C	10-20%	30-34%	33	1,098	2040
	Ruamāhanga – Waihenga	Ruamāhanga at Waihenga Bridge	A	A	<5%	<20%	33	375	Maintain
	Ruamāhanga – Pukio	Ruamāhanga at Pukio	B	B	5-10%	20-30%	40	875	Maintain
	Ruamāhanga – upstream of confluence with Lake Wai outlet	Ruamāhanga at Boat Ramp	B*	B	5-10%	20-30%	130	900	Maintain
Northern rivers	Kopuaranga River	Kopuaranga River at Stuarts	D	C	10-20%	30-34%	130	1,200	2040
	Whangaehu River	Whangaehu River at 250 metres from confluence	D	C	10-20%	30-34%	130	1,200	2040

Table 8: Numeric freshwater objectives for river freshwater management units: *E. coli* (continued)

FMU group	River freshwater management unit	Monitoring point	NOF attributes						Freshwater objectives to be met by?
			E. coli						
			Current state	Freshwater objective					
			NOF band	NOF band	% exceedances		Concentration (mg/L) ≤		
					≥540cfu/100mL	≥260cfu/100mL	Median	95th percentile	
Valley floor streams	Parkvale Stream	Parkvale Stream at Renalls Weir	E	C	10-20%	30-34%	130	1,200	2040
	Otukura Stream	Otukura Stream	D*	C	10-20%	30-34%	20	1,200	2040
	Valley floor streams (to Lake Wai and to Ruamāhanga)	TBC	-	C	10-20%	30-34%	20	1,200	Maintain
Western hill rivers	Upper Ruamāhanga River	Ruamāhanga River at Double Bridges	D	C	10-20%	30-34%	13	183	2040
	Waipoua River	Waipoua River at Colombo Road Bridge	B	A	<5%	<20%	34	540	2040
	Waingawa River	Waingawa River at South Road	A	A	<5%	<20%	13	183	Maintain
	Mangatarere Stream	Mangatarere River at State Highway 2	D	B	5-10%	20-30%	48	218	2040
	Waiōhine River	Waiōhine River at Bicknells	A	A	<5%	<20%	15	129	Maintain
	Tauherenīkau River	Tauherenīkau River at Websters	A	A	<5%	<20%	19	210	Maintain
	Western lake streams	TBC	-	A	<5%	<20%	19	210	Maintain
South coast streams	South coast streams	TBC	-	A	<5%	<20%	19	210	Maintain

Table 9: Numeric freshwater objectives for river freshwater management units: ammonia and nitrate toxicity

See the note to Table 5 for interpretation. Links to the relevant technical reports used to translate the Committee's work into numeric objectives are available here: http://www.gw.govt.nz/ruamahanga-technical-reports.

FMU group	River freshwater management unit	Monitoring point	NOF attribute								Freshwater objectives to be met by?
			Ammonia (toxicity)				Nitrate (toxicity)				
			Current state	Freshwater objective			Current state	Freshwater objective			
			NOF band	NOF band	Concentration (mg/L) ≤		NOF band	NOF band	Concentration (mg/L) ≤		
					Median	95th percentile			Median	95th percentile	
Aorangi rivers	Tauanui River	TBC	A*	A	0.006	0.043	A*	A	0.13	0.33	Maintain
	Tūranganui River	TBC	A*	A	0.009	0.046	A*	A	0.15	0.61	Maintain
Eastern hill rivers	Taueru River	Taueru River at Gladstone	A	A	0.005	0.044	B	A	0.71	1.41	2040
	Makahakaha Stream	TBC	A*	A	0.006	0.019	B*	A	0.73	1.50	2040
	Huangarua River	Huangarua River at Ponatahi Bridge	A	A	0.005	0.014	A	A	0.22	0.66	Maintain
Eastern hill streams group	Eastern hill streams	TBC	-	A	0.005	0.014	-	A	0.22	0.66	Maintain
Main stem Ruamāhanga River	Ruamāhanga – Wardells	Ruamāhanga at Wardells	B*	A	0.011	0.050	A*	A	0.54	1.24	2040
	Ruamāhanga – Gladstone Bridge	Ruamāhanga at Gladstone Bridge	B	A	0.005	0.050	A	A	0.31	0.96	2040
	Ruamāhanga – Waihenga	Ruamāhanga at Waihenga Bridge	B*	A	0.005	0.040	A*	A	0.50	0.84	2040
	Ruamāhanga – Pukio	Ruamāhanga at Pukio	A*	A	0.005	0.030	A*	A	0.33	0.94	Maintain
	Ruamāhanga – upstream of confluence with Lake Wai outlet	Ruamāhanga at Boat Ramp	A*	A	0.009	0.035	A*	A	0.39	0.98	Maintain
Northern rivers	Kopuaranga River	Kopuaranga River at Stuarts	A	A	0.005	0.024	A	A	0.82	1.17	Maintain
	Whangaehu River	Whangaehu River at 250m from Confluence	A	A	0.005	0.050	A	A	0.47	1.50	Maintain

Table 9: Numeric freshwater objectives for river freshwater management units: ammonia and nitrate toxicity (continued)

FMU group	River freshwater management unit	Monitoring point	NOF attribute								Freshwater objectives to be met by?
			Ammonia (toxicity)				Nitrate (toxicity)				
			Current state	Freshwater objective			Current state	Freshwater objective			
			NOF band	NOF band	Concentration (mg/L) ≤		NOF band	NOF band	Concentration (mg/L) ≤		
					Median	95th percentile			Median	95th percentile	
Valley floor streams group	Parkvale Stream	Parkvale Stream at Renalls Weir	B	A	0.012	0.050	B	A	1.00	1.50	2040
	Otukura Stream	Otukura Stream	B*	A	0.005	0.050	B*	A	1.00	1.30	2040
	Valley floor streams (to Lake Wai and to Ruamāhanga)	TBC	-	A	0.005	0.050	-	A	1.00	1.30	Maintain
Western hill rivers	Upper Ruamāhanga River	Ruamāhanga River at Double Bridges	A	A	0.005	0.019	A	A	0.09	0.43	Maintain
	Waipoua River	Waipoua River at Colombo Rd Bridge	A	A	0.005	0.008	B	A	0.63	1.41	2040
	Waingawa River	Waingawa River at South Rd	A	A	0.005	0.023	A	A	0.06	0.22	Maintain
	Mangatarere Stream	Mangatarere River at State Highway 2	B	B (top of band)	0.028	0.128	B	A	0.99	1.50	2040
	Waiōhine River	Waiōhine River at Bicknells	A	A	0.005	0.015	A	A	0.34	0.85	Maintain
	Tauherenīkau River	Tauherenīkau River at Websters	A	A	0.005	0.009	A	A	0.04	0.14	Maintain
	Western lake streams	TBC	-	A	0.005	0.009	-	A	0.04	0.14	Maintain
South coast streams group	South coast streams	TBC	-	A	0.005	0.009	-	A	0.04	0.14	Maintain

Table 10: Numeric freshwater objectives for rivers freshwater management units: periphyton and macroinvertebrate community index

See the note to Table 5 for interpretation. Links to the relevant technical reports used to translate the Committee's work into numeric objectives are available here: http://www.gw.govt.nz/ruamahanga-technical-reports.

FMU group	River freshwater management unit	Monitoring point	Periphyton			Macroinvertebrate community health*				Freshwater objectives to be met by?
			Current state	Freshwater objective		River class	Current state	Freshwater objective		
			NOF band	NOF band	Chl a (mg/m2)		Band	Band	Band	
Aorangi rivers	Tauanui River	TBC	C/D*	B	>50 and <120	4	Fair*	Good	≥110 and <130	2040
	Tūranganui River	TBC	C/D*	B	>50 and <120	4	Fair*	Good	≥110 and <130	2040
Eastern hill rivers	Taueru River#	Taueru River at Gladstone Bridge	D*	C	>120 and <200	3	Good	Good	≥105 and <130	2040
	Makahakaha Stream#	TBC	-	B	>50 and <120	5	Fair*	Good	≥100 and <120	2030
	Huangarua River#	Huangarua River at Ponatahi Bridge	C	B	>50 and <120	4	Fair	Good	≥110 and <130	2080
Eastern hill streams group	Eastern hill streams^	TBC	-	B	>50 and <120	3/6	-	Fair	≥80 and <105	Maintain
Main stem Ruamāhanga River	Ruamāhanga – Wardells	Ruamāhanga at Wardells	B*	B	>50 and <120	4	Fair*	Fair	≥90 and <110	Maintain
	Ruamāhanga – Gladstone Bridge	Ruamāhanga at Gladstone Bridge	B	B	>50 and <120	4	Fair*	Fair	≥90 and <110	Maintain
	Ruamāhanga – Waihenga	Ruamāhanga at Waihenga Bridge	B	B	>50 and <120	4	Fair*	Fair	≥90 and <110	Maintain
	Ruamāhanga – Pukio	Ruamāhanga at Pukio	-	B	>50 and <120	4	Good*	Good	≥110 and <130	Maintain
	Ruamāhanga – upstream of confluence with Lake Wai outlet	Ruamāhanga at Boat Ramp	-	B	>50 and <120	4	Fair*	Fair	≥90 and <110	Maintain

Table 10: Numeric freshwater objectives for rivers freshwater management units: periphyton and macroinvertebrate community index (continued)

FMU group	River freshwater management unit	Monitoring point	Periphyton			Macroinvertebrate community health*				Freshwater objectives to be met by?
			Current state	Freshwater objective		River class	Current state	Freshwater objective		
			NOF band	NOF band	Chl a (mg/m2)		Band	Band	Band	
Northern rivers	Kopuaranga River	Kopuaranga River at Stuarts	D	C	>120 and <200	5	Fair	Good	≥100 and <120	2040
	Whangaehu River#	Whangaehu River at 250 metres from confluence	-	C	>120 and <200	3	Fair*	Good	≥105 and <130	2040
Valley floor streams group	Parkvale Stream	Parkvale Stream at Renalls Weir	B	B	>50 and <120	5	Fair*	Good	≥100 and <120	2040
	Otukura Stream	Otukura Stream	-	B	>50 and <120	6	-	Fair	≥80 and <105	Maintain
	Valley floor streams (to Lake Wai and to Ruamāhanga)	TBC	-	B	>50 and <120	6	-	Good	≥100 and <120	Maintain
Western hill rivers	Upper Ruamāhanga River	Ruamāhanga River at Double Bridges	A	A	≤50	4	Fair	Good	≥110 and <130	2040
	Waipoua River	Waipoua River at Colombo Road Bridge	B*	A	≤50	4	Fair	Good	≥110 and <130	2040
	Waingawa River	Waingawa River at South Road	A	A	≤50	4	Good	Good	≥110 and <130	Maintain
	Mangatarere Stream	Mangatarere River at State Highway 2	C	B, then A	>50 and <120	4	Fair	Good	≥110 and <130	2080
	Waiōhine River	Waiōhine River at Bicknells	A	A	≤50	4	Fair	Good	≥110 and <130	2080
	Tauherenīkau River	Tauherenīkau River at Websters	A*	A	≤50	4	Fair	Good	110 and <130	2040
	Western lake streams^	TBC	-	A	≤50	1/2	-	Good or better	Class 1: ≥120 and <130 Class 2: ≥105 and < 130	Maintain
South coast streams group	South coast streams^	TBC	-	A	≤50	1/2	-	Fair	Class 1: ≥110 and <120 Class 2: ≥80 and <105	Maintain

Table 11: Numeric freshwater objectives for lake freshwater management units for NOF attributes: *E. coli*, total nitrogen and total phosphorus

Lake FMU	Monitoring site	NOF attributes													Freshwater objectives to be met by?
		E. coli						Total nitrogen			Total phosphorus				
		Current state	Freshwater objective					Current state	Freshwater objective		Current state	Freshwater objective			
		NOF band	NOF band	% exceedances		Concentration (mg/L)		NOF band	NOF band	Concentration (mg/L)	NOF band	NOF band	Concentration (mg/L)		
				≥540cfu/ 100mL	≥260cfu/ 100mL	Median	95th percentile			Median			Median		
Lake Wairarapa	Lake Wairarapa Site 2	A	A	<5%	<20%	65	300	C	C	>500 and ≤800	D	C	>20 and ≤50		2080
Lake Ōnoke	Lake Ōnoke 1	B/C	A	<5%	<20%	130	540	C	B	>160 and ≤350	B	B	>10 and ≤20		2040

Table 12: Numeric freshwater objectives for lake freshwater management units: ammonia toxicity, phytoplankton, trophic level index, total suspended sediment and macrophytes

Lake FMU	Monitoring site	NOF attributes								Non-NOF attributes						Freshwater objectives to be met by?
		Ammonia toxicity				Phytoplankton				Trophic level index		Total suspended sediment		Macrophytes		
		Current state	Freshwater objective			Current state	Freshwater objective			Current state	Freshwater objective	Current state	Freshwater objective	Current state	Freshwater objective	
		NOF band	NOF band Median	Concentration (mg/L) 95th percentile		NOF band	NOF band Annual median	Concentration chlorophyll a (mg/m3) Annual max		Trophic level index category		Narrative state		Estimated band[52]		
Lake Wairarapa	Lake Wairarapa Site 2	A	A	0.005	0.023	D	C	>5 and ≤12	>25 and ≤60	>5 Supertrophic	4-5 Eutrophic	Poor	Fair	D	C	2080
Lake Ōnoke	Lake Ōnoke 1	A	A	0.010	0.040	B	B	>2 and ≤5	>10 and ≤25	4-5 Eutrophic	2-3 Ogliotrophic	Poor	Fair	D	C	2040

52 C = 20-50% Ecological communities are moderately impacted from natural condition

D = <20% Ecological communities significantly impacted by reduced macrophyte cover due to loss of habitat, food sources and less sediment stabilisation. Macrophytes have limited ability to buffer nutrient loads and there is a high risk of a regime shift to a persistent, degraded state