Waimakariri Water Zone Committee

Draft Zone Implementation Programme Addendum

SEPTEMBER 2018

WAIMAKARIRI LAND&WATER SOLUTIONS PROGRAMME

WAIMAKARIRI DISTRICT COUNCIL

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Waimakariri Zone Committee

The Waimakariri Water Zone Committee is a joint committee of the Waimakariri District Council and Environment Canterbury.

The Committee is made up of local residents – the members in 2018 are:

David Ashby

Grant Edge

Carolyne Latham

Gary Walton

Judith Roper-Lindsay

Cameron Henderson

Michael Blackwell

Cherie Williams – Ngāi Tūāhuriri Rūnanga representative

Arapata Reuben – Ngāi Tūāhuriri Rūnanga representative

Sandra Stewart – Councillor, Waimakariri District Council

Claire McKay – Councillor, Environment Canterbury

With support from:

Technical support has been led by the strategy, planning and science sections of Environment Canterbury, with support from Waimakariri District Council staff l and specialist advisers

Mō tātou, ā, mō kā uri ā muri ake nei

For us and our children after us

PROVIDING FEEDBACK

THE ZONE COMMITTEE IS SEEKING YOUR FEEDBACK TO EXPAND OUR UNDERSTANDING OF FRESHWATER ISSUES AND HOW BEST TO ADDRESS THESE ISSUES.

Please provide your feedback by visiting **www.ecan.govt.nz/waimakariri-water** or email **waimakaririzone@ecan.govt.nz**

To provide direct feedback see us at one of the community workshops held in September and October 2018 or post your written feedback to:

Meredith Macdonald,
Environment Canterbury,
PO Box 345, Christchurch 8140.

FOR MORE INFORMATION VISIT: www.ecan.govt.nz/waimakariri-water

CONTENTS

PART A – INTRODUCTION

A1. THE CANTERBURY WATER MANAGEMENT STRATEGY (CWMS)

The Canterbury Water Management Strategy (CWMS) was developed by the Canterbury Mayoral Forum in 2008 as a collaboration between Canterbury's 10 territorial authorities and Environment Canterbury.

The aim of the strategy is: "To enable present and future generations to gain the greatest social, economic, recreational and cultural benefits from our water resources within an environmentally sustainable framework."

Canterbury Water Management Strategy – Targets

A set of 10 targets provides the strategy with a direction and balance, while ensuring all aspects are advanced in parallel. The strategy also establishes first and second order priorities , as below:

- First order priorities: environment, customary use, community supplies and stock water.
- Second order priorities: irrigation, renewable electricity generation, recreation and amenity

Achieving continued economic production and environmental quality are also key to the strategy, as it is for the Resource Management Act (RMA) and the National Policy Statement for Freshwater Management 2017 (NPS-FM).

The CWMS established 10 zone committees across Canterbury , largely defined by territorial authority boundaries. The zone committees implement the strategy through collaboration, assessment, and decision making. Each zone committee has developed a detailed 'Zone Implementation Programme' and works closely with their local community. Although Zone Implementation Programmes are not statutory documents there is a very clear expectation and commitment for the programmes to be implemented, resourced, and given effect to through both regulation and on the ground actions.

The Zone Implementation Programme 'Addendum' (ZIPA) builds on the original Zone Implementation Programme and provides recommendations to guide both the sub-region plan change to section 8 (Waimakariri) of the Canterbury Land and Water Regional Plan (LWRP), and actions to be advanced within the Waimakariri Water Zone and the Waimakariri District Plan. These recommendations, the sub-region plan change, and the programme of actions are collectively referred to as the Waimakariri Land and Water Solutions Programme.

For more information on the CWMS go to:
https://www.ecan.govt.nz/your-region/plans-strategies-and-bylaws/canterbury-water-management-strategy/

The National Policy Statement for Freshwater Management

The NPS-FM sets out the direction for freshwater quality and quantity management in New Zealand. Regional councils must give effect to the requirements of the NPS-FM when developing statutory plans and plan changes. The NPS-FM requires freshwater quality to be maintained (where it is of good quality),or improved over time (where it does not meet the requirements of the NPS-FM), and includes a national objectives framework for achieving this. The NPS-FM also requires engagement with iwi, hapū, and the community in setting freshwater outcomes, and enables different methods and timeframes to be set. This document has provided the basis for the committee's recommendations in terms of the freshwater outcomes and timeframes.

For more information on the NPS-FM go to:
http://www.mfe.govt.nz/fresh-water/national-policy-statement/about-nps

A2. IMPLEMENTATION OF THE RECOMMENDATIONS

The recommendations will be implemented through a sub-region plan change to section 8 of the LWRP, and importantly through practical actions in priority areas and catchments. The zone committee wants actions delivered in a coordinated way through non-statutory catchment management plans. The development of these plans and the practical actions that follow requires funding from a variety of sources.

The LWRP sets out the planning framework for the management of land and water resources in Canterbury and is one method for implementing the CWMS.

Plan Change 5 (PC5) to the LWRP addresses water quality issues throughout the Canterbury region. When made operative it will introduce new definitions, policies, rules, limits and schedules which require farming activities to operate at "Good Management Practice". PC5 provides both the foundation and starting point for managing nutrient losses from farming within the Waimakariri Water Zone.

The Waimakariri River Regional Plan (WRRP) also has legal effect in part of the Waimakariri Water Zone, and manages water quantity, water quality and works in river and lake beds. Having two regional plans managing freshwater in the same zone adds unnecessary complexity for the regulator and plan user. This process provides an opportunity to create a simpler framework by incorporating the part of the WRRP that applies to the Waimakariri sub-region into section 8 of the LWRP.

The Waimakariri District Council will also consider the zone committee's recommendations when developing work programmes, budgets and reviewing their district plan.

PART B. OVERVIEW OF THE WAIMAKARIRI WATER ZONE

B1. CATCHMENT & COMMUNITY PROFILE – AN OVERVIEW

The Waimakariri Water Zone (Maps B1 & B2) encompasses

- The Ashley River/Rakahuri catchment and Ashley Estuary (Te Aka Aka);
- The catchments of the northern tributaries of the Waimakariri River;
- The Loburn Fan;
- The Ashley-Waimakariri Plain and associated groundwater zones (Ashley, Eyre, and Cust);
- A network of spring-fed streams and lagoons near the coast and
- Hill and high country in the north-western portion.

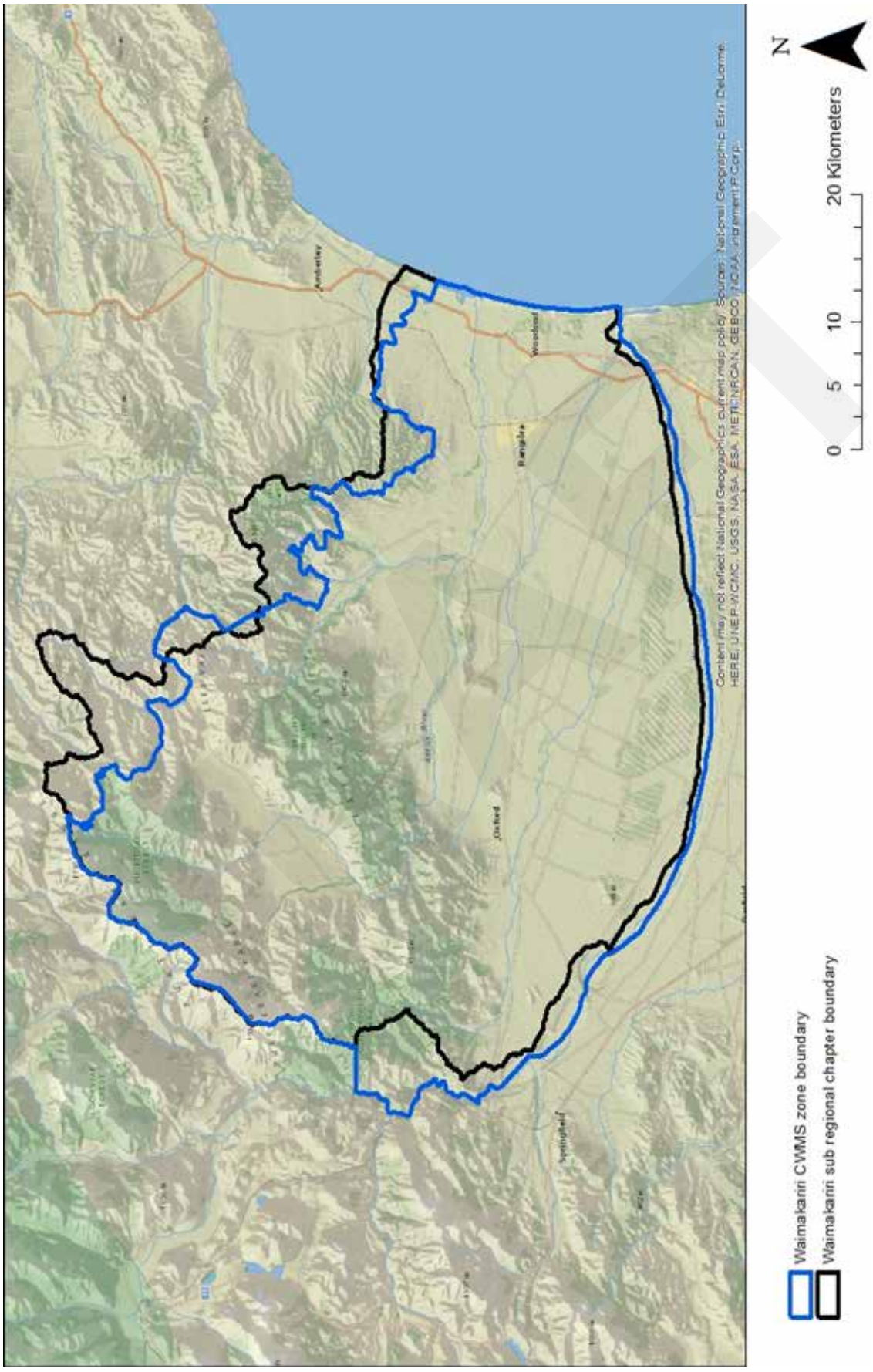
Much of the land east of Rangiora, where the spring-fed streams are located, is reclaimed swamp which is still subject to poor drainage, occasional flooding and an extensive land drainage network.

Waimakariri Water Zone

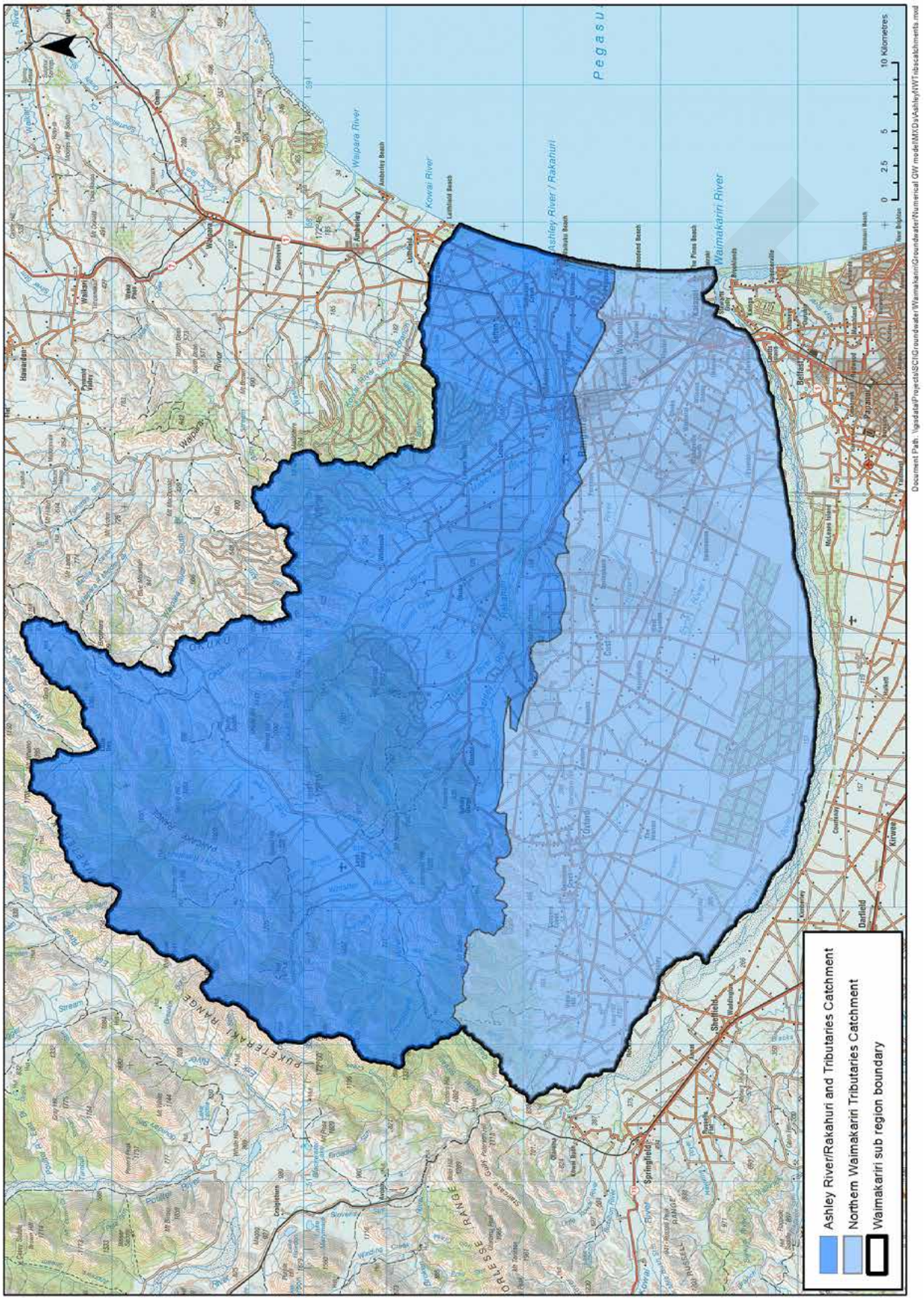
The Waimakariri Water Zone boundaries are similar to those of the Waimakariri District Council. The zone lies north of the Waimakariri River and extends from Pegasus Bay in the east to the Puketeraki Range in the west.

Much of the land to the eastern part of the water zone is subject to poor drainage and occasional flooding. The rivers, streams, lagoons and wetlands have always been important places and a food basket for Ngāi Tūāhuriri. The water zone is part of the Rūnanga's takiwā.

MAP B1. WAIMAKARIRI WATER ZONE BOUNDARIES



MAP B2. ASHLEY RIVER/RAKAHURI TRIBUTARIES AND NORTHERN WAIMAKARIRI TRIBUTARIES CATCHMENTS



Topography

The topography of the zone ranges from hills and mountains, as high as 1800m, in the northwest to flat coastal plains in the southeast. Alluvial sand and gravel deposits dominate the plains with finer-grained estuarine deposits along the coast. Light and very light soils are found between the Eyre River and Waimakariri River. The Loburn Fan, areas along the Cust River and the coastal plain are characterised by heavier soils. Hardpan soils which promote run-off to surface water are found to the north of the Ashley River/Rakahuri, the Mairaki Downs and the hill-country near Oxford.

Water Quality

Surface water quality and aquatic ecosystems are generally degraded due to sediment and high nitrate concentrations (e.g. Silverstream at Island Road and Harpers Road). However, many areas still support important ecological values, particularly the upper catchments of spring-fed streams like Silverstream and Cust River / Cust Main Drain. Te Aka Aka is a sensitive environment at the bottom of the Ashley River/Rakahuri catchment and has high cultural, social and environmental values. There has been historical habitat loss around the margins of the estuary and high concentrations of sediment and nitrogen promote macroalgae growth with potential for eutrophication.

The Waimakariri – Ashley Plain is prone to extended dry periods with high evapotranspiration, especially during north-westerly winds. Irrigation demand is high in the summer months when evapotranspiration is well above the average rainfall and there is a large soil moisture deficit. Flow in the rivers and streams fluctuates seasonally. Flow has also changed over the years with an increase in base flow (no rainfall input) in some lowland streams since the start of the WIL scheme in 2000 and long-term declines in the Ashley River/Rakahuri flow, probably due to drier climatic conditions. There is a complex pattern of flow gain and loss across the plains east of the foothills in the Ashley River/Rakahuri and Cust River/Cust Main Drain. These water bodies, together with the Eyre River, lose water to permeable alluvial gravels as they leave the foothills. These losses recharge the groundwater system and resurface as lowland stream flow.

Water Quantity

Water allocation is currently governed by two regional plans; the LWRP and WRRP. One of the key differences between these plans is the method for calculating the effects of pumping groundwater on nearby streams. The LWRP method quantifies the cumulative effect of abstraction on river flow over an irrigation season (pumping an average rate for 150 days and a maximum rate for 7 days) and is applied throughout most of Canterbury. The WRRP method estimates the effect of shallow groundwater takes if pumped at an average rate over 30 days. The LWRP method is a more defensible calculation of the depletion effect on rivers and generally provides a higher level of protection. But transition to the LWRP method will mean that more groundwater takes in the area covered by the WRRP will be classified as stream depleting. These newly identified stream depleting takes may see a reduction in reliability of supply as they will have a minimum flow imposed at times of low flow, whereas previously the abstraction would have been unrestricted.

Water Allocation

The Waimakariri Water Zone has been divided into Surface Water Allocation Zones (SWAZs) which provide a water management regime using minimum flow and allocation limits. There are some SWAZs that are above, at or near their allocation limit and several where the current minimum flow does not provide adequate protection for some aquatic species.

There are five Groundwater Allocation Zones (GAZ) – Ashley, Cust, Eyre River, Loburn and Kowai. The Kowai GAZ straddles the boundary with the Hurunui CWMS Water Zone. Although groundwater allocation has increased significantly in the last decade, allocated volume in the Ashley, Cust, Loburn and Kowai GAZs is currently under the allocation limit. The Eyre River GAZ is fully allocated.

Approximately 70% of the allocated groundwater is used for agriculture with 25% used for community water supply. Long-term groundwater trends are steady or increasing in some areas, likely due to leaking water races and irrigation on the plains and declining in others (e.g. the Ashley GAZ), probably due to drier climate conditions and increased groundwater abstraction.

Groundwater quality is generally good and mostly meets drinking water standards without treatment. There are notable exceptions to this; with high nitrate concentrations found in shallow private water supply wells near Cust, Ashley and Eyreton. Also, groundwater provides the transport pathway for nitrate to spring-fed streams.

Biodiversity

Waimakariri District/Zone has diverse terrestrial and aquatic habitats supporting common and rarer plants and animals, including threatened species. The vegetation and habitats are:

The upper Ashley River/Rakahuri, including Lees Valley, supports:

- intact indigenous forest;
- remnant patches of beech and mixed podocarp forest;
- shrubland and grassland/herbfield vegetation;
- open rocky habitats at higher altitudes and in river gorges;
- springs and streams which are the source of the Ashley River/Rakahuri;
- springs and streams which are the source of some northern Waimakariri tributaries;
- wetlands.

The dry plains (roughly west of State Highway 1) support:

- three larger remnants of dry shrubland/grassland;
- scattered dry shrubland remnants on private property, including corners of paddocks, along fence lines and associated with exotic vegetation (such as under riparian willows).
- spring fed lowland streams with, in places, riparian planting
- the braided reaches of the Ashley River/Rakahuri

The coastal plains (roughly east of State Highway 1) support:

- coastal dune and wetlands remnants; in some places (e.g. near Pegasus and Tūhaitara Coastal Park) revegetation has actively increased indigenous plant cover and indigenous fauna populations;
- spring fed lowland streams with, in places, riparian planting
- Ashley Estuary (Te Aka Aka) - an extensive estuarine area supporting many indigenous plants and animals.

Several nationally threatened plant and animal indigenous species are located within the zone, as well as many locally rare species (that is, not common within the High or Low Plains Ecological Districts).

The rivers, streams, lagoons and the wetlands of the Waimakariri have always been an important place and food basket for Ngāi Tahu and Ngāi Tūāhuriri.

The Ashley River/Rakahuri and Saltwater Creek Estuarine areas are recognised by the International Union for Conservation of Nature (IUCN) as a wetland of "international significance".

Social

The current estimated population for the Waimakariri District is 59,300. Approximately 77% of the District's population lives in the south-east, south of the Ashley River/Rakahuri and east of Two Chain Road area. The Oxford township provides the focal point for social activity for the rural community to the south-west and west of the District. There are smaller social "hubs", often based around schools and sports facilities, throughout the District that provide the basis for maintenance of community cohesion at a local level.

The age distribution for the District differs significantly from that of Canterbury, with few younger adults living in the area, and a higher percentage of residents aged 40 years and over. There has been a slight increase in percentage of non-European children (from 11% in 2000 to 19% in 2017).

There has been a strong increase in local employment between 2000 and 2017 with a proportionally lower increase in agricultural employment. Approximately 40% of the workforce travels to Christchurch to work.

Dairy farming has been a feature of farming in the District since the 1890s with a significant increase occurring with the irrigation provided by the Waimakariri Irrigation Limited scheme.

While the community as a whole has an interest in the measures proposed in this draft ZIP Addendum, it is the people involved with the management of the farms who will have to comply with the proposed changes and some may find this challenging.

Recreation

There are many recreational opportunities in the Waimakariri Water Zone including large areas of public land such as Tūhaitara Coastal Park, Waimakariri and Ashley Regional Parks and Department of Conservation's estate to the west of the zone. The Waimakariri District Council's Ashley Gorge and Silverstream Reserves, Northbrook Ponds and Kaiapoi Lakes are also important recreation areas.

Ashley Gorge and the upper Okuku River are valued for white water kayaking. The Waimakariri and Kaiapoi rivers and Pegasus Lake are used extensively for rowing, dragon-boating and mana-waka paddling. The Waimakariri Yacht and Power Boat Club is based at Kairaki, and there are opportunities for small boat sailing on Pegasus Lake.

Fishing is another significant activity from the Waimakariri River to the Ashley River/Rakahuri. The Kaiapoi River is another important waterway for whitebait, trout and salmon fishing, with some salmon raised at the Silverstream hatchery finding their way back into the Kaiapoi River.

Economy

The largest sectors in the Waimakariri Water Zone economy are construction and retail trade, and these are proportionately larger than both the Canterbury and national averages. Agriculture is also an important part of the economy (top 5) and is similarly overrepresented in the zone. Growth has been strong since the Canterbury earthquake sequence – driven by construction and population growth.

Land use

Approximately 103,490 ha (40% of the land area) is used to farm sheep, deer, and beef. Dairy and dairy support account for 38,000 ha (16% of land area). There are also many small block holdings (lifestyle blocks) encompassing approximately 29,000 ha (12% of land area). In total, there are approximately 37,000 ha of irrigated land in the Waimakariri zone with three irrigation schemes: Waimakariri Irrigation Limited (WIL), Loburn Irrigation Company and the Moy Flat scheme.

B2. NGĀI TŪĀHURIRI VALUES

Mihi

Ko o matou whakaaro ki te whenua	*Our thoughts are to the land*
Nga roto, nga awa, te moana	*To the lakes, the rivers and the sea*
Hei here I a tātou	*That bind us together*
O nga tupu tupunga	*To preserve well-being of the vines*
o Te Aka O Tu Whenua	*Of Tu Whena (land and water)*
Hei whakato whakatipu	*That gave rise to*
I nga mahinga kai a te Iwi	*The people's food gathering places*
Ko matou Tūmanako	*Our hopes are that*
Te tatau o te Mātauranga	*The doors of knowledge*
o nga whakaaro	*And the doors thought*
Hei here ai a Iwi,	*That have held our people*
a mana	*and our authority captive*
Kawhakapuakina	*Will be opened*
Kia marino ai te wai	*That the waters of these thoughts*
O te whakaaro kotahi	*Be calmed and settled as one thought*
Kia tau ki uta	*That this canoe of hope*
Tēnei waka tūmanako	*That this canoe of love*
Tēnei waka aroha	*May reach shore safely*
Kia tau te rangimarie	*And that peace may prevail amongst us*
Tēnei te tangi	*This is the call*
O nga whakatupuranga	*Of the rising generations*
O Ngāi Tahu Whānui	*Of Ngāi Tahu people*
Kia koutou, nga tangata	*To you, the people*
O nga marae maha	*Of the many marae*
Kia ora tātou e tu nei	*Greetings to you all*

Ngāi Tūāhuriri contend that the Crown's right to govern, as gifted in Article the First, is totally dependent on the honouring of Article the Second. That is, the recognition and protection of the Tribe's resource ownership authority rights, including the rights to use and have access to those resources.

Ngāi Tūāhuriri maintain that they did not alienate their resources or taonga by signing the Treaty of Waitangi. As the Crown had not acquired the ownership of the Tribe's water, fisheries, and mahinga kai-food and other resources, Ngāi Tūāhuriri maintain that these taonga still belong to them.

This Ngāi Tūāhuriri position has been reinforced by Te Runanga o Ngai Tahu who have taken it to be the Ngai Tahu position on Freshwater, that position is;

- Ngāi Tahu have rights, interests, obligations and responsibilities in the flow and quality of water in our takiwā.

- Ngāi Tahu has ownership over freshwater and will continue to exercise tino rangatiratanga in our takiwā.
- Ngāi Tahu shall accept a Governing Body which reflects the Treaty Partnership.
- That Governing Body shall lead policy and regulatory development to achieve Freshwater aspirations.
- Freshwater royalties or taxes (or similar) shall be used to meet that Governing Body's obligations, responsibilities and aspirations in Freshwater.

The Waimakariri Zone Committee acknowledges that the rights and interests of iwi have not been resolved and that this creates considerable uncertainty in New Zealand's freshwater management system. The Waimakariri Zone Committee is of a view that leaving iwi rights and interests unresolved will create considerable risks to the long-term durability of any freshwater management framework.

The Waimakariri Zone Committee urges the Crown to prioritise work with iwi to reach agreement on how to resolve the rights and interests of iwi in freshwater.

Recommendation:

That Environment Canterbury and the Waimakariri District Council, along with Local Government NZ, work together with Ngāi Tūāhuriri and Ngāi Tahu to lobby central government (the Crown) to prioritise the resolution of iwi rights and interests in freshwater.

Note: The zone committee did not reach consensus on this recommendation. While there was general support for the above recommendation, an alternate view queried if this was part of the zone committee's scope for this ZIP Addendum.

B3. ZONE COMMITTEE VISION, PRINCIPLES AND ROLE

Zone Committee Vision

Mō tātou, ā, mō kā uri ā muri ake nei
For us and our children after us

The Waimakariri Water Zone Committee has had this Ngāi Tahu whakatoki as an expression of commitment since it was formed in 2010. Along with Ngāi Tūāhuriri Rūnanga, and many others in our community, the zone committee is committed to achieving improved water management outcomes for the Waimakariri Water Zone within a generation.

Zone Committee Principles

A 'whole of waterway' approach is taken to integrate management from the mountains to the sea – Ki Uta Ki Tai. The zone committee wish to see activities integrated across agencies and groups working together using an outcome-based approach.

Kaitiakitanga is integrated into each pathway with actions to address water quality and quantity concerns and provisions for improved customary use and the involvement of Rūnanga in water management weaved through this document.

The pathways and recommendations in this ZIP Addendum represent an integrated approach to water management and should not be considered in isolation. The zone committee recognises the need for an integrated approach to water quality, quantity, and land management.

The collaborative approach used in the development of the Canterbury Water Management Strategy and by the zone committee in developing this Solutions Programme must be carried through to the implementation of the recommendations.

The Role of the Waimakariri Water Zone Committee

The Waimakariri Water Zone Committee was formed in 2010 as a joint committee of Waimakariri District Council and Environment Canterbury. The zone committee has representatives from the two councils, Ngāi Tūāhuriri Rūnanga, and the wider community.

The zone committee's role is to develop and facilitate enduring water management solutions that give effect to the Canterbury Water Management Strategy's vision, principles and targets. The zone committee's initial priority was to complete the Waimakariri Zone Implementation Programme (ZIP), which it completed in 2012. This draft ZIP Addendum (2018) builds upon the original ZIP, including the community outcomes, which provide a sustained focus for the Waimakariri Water Zone and community.

The zone committee's role is to facilitate community-based solutions, while balancing cultural, economic, environmental & social values for the water zone. The zone committee, like the Canterbury Water Management Strategy, is focused on collaboration and seeks to reach decisions by consensus. In developing these draft recommendations, the zone committee hasn't always reached consensus. Where a divergence of views occurred, it has been noted.

What Does Success Look Like?

The zone committee's measure of success is based on improvements measured against Canterbury Water Management Strategy targets, while achieving the community outcomes of this Zone Implementation Programme Addendum (see section B5).

The zone committee appreciates time will be an important factor in achieving these targets and outcomes. The initial steps need to focus on halting declining trends in water quality where they have been identified in the water zone . The zone committee is committed to what can be achieved in a generation and the following graphic illustrates what success can look like, relative to the targets of the Canterbury Water Management Strategy.

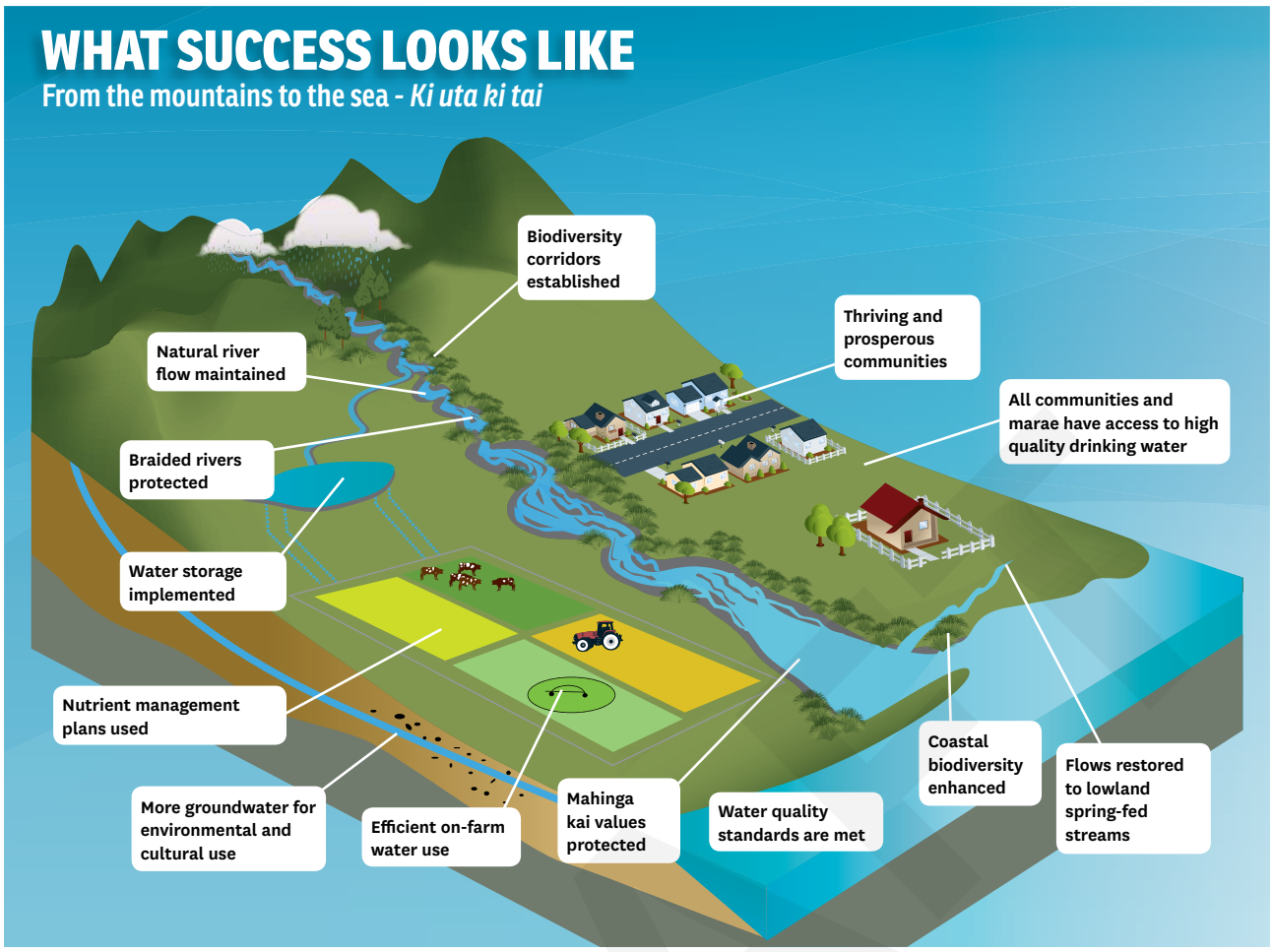


Figure B.1 The Canterbury Water Management Strategy – What Success Looks Like

B4. WAIMAKARIRI WATER ZONE – COMMUNITY OUTCOMES

These community outcomes were affirmed by the zone committee, based community feedback gathered from a series of community meetings held in 2014/15 and 2016.

They provide a primary focus for this Solutions Programme and align with the original priority outcomes of the Zone Implementation Programme developed with the community in 2011.

The narratives for each outcome represent the zone committee's vision and 'measures of success'.

Outcome 1 – The water quality and quantity of spring-fed streams maintains or improves mahinga kai gathering and diverse aquatic life

Narrative: The habitat, flow and water quality in the spring fed streams supports abundant and diverse aquatic life (including native flora and fauna). Spring fed streams contain safe and plentiful kai for gathering. The flow and visual appearance of the spring fed streams meet aesthetic values and promotes customary use. Plant and animal pest species are managed or eliminated.

Outcome 2 – The Ashley River/Rakahuri is safe for contact recreation, has improved river habitat, fish passage, and customary use; and has flows that support natural coastal processes

Narrative: The river meets national standards for swimmable contact recreation. The habitat and fish passage along the river are improved to encourage more customary use and mahinga kai gathering. Braided river bird populations are protected, and numbers improved. The river mouth and estuary are healthy and functioning.

Outcome 3 – The Waimakariri River as a receiving environment is a healthy habitat for freshwater and coastal species, and is protected and managed as an outstanding natural landscape and recreation resource

Narrative: Flow and water quality are maintained to support and enhance aquatic life. The river mouth is healthy and functioning. The natural braided characteristics of this alpine river are recognised for aesthetic and amenity values. Recreational opportunities, along and on the river, are sustained.

Outcome 4 – The zone has safe and reliable drinking water, preferably from secure sources

Narrative: Community drinking and domestic supplies meet New Zealand drinking water standards .

Outcome 5 – Indigenous biodiversity in the zone is protected and improved

Narrative: Protect and improve the indigenous biodiversity, habitat or ecosystems. Plant and animal pest species are managed or eliminated.

Outcome 6 – Highly reliable irrigation water, to a target of 95%, is available in the zone

Narrative: Irrigation water (from both surface and groundwater) reliably supplies water to meet demand when operating within flow and allocation regimes. 100% of the irrigated area can be irrigated 95% of the time. The effects of climate change are considered in the planning and effective long-term management of water and land. Opportunities for water storage are considered.

Outcome 7 – Optimal water and nutrient management is common practice

Narrative: All land and water users' practise management that maximises water use efficiency and minimises inputs of nutrients and pollutants to water. Industry agreed Good Management Practices and Farm Environment Plans are adopted as everyday farm management tools.

Outcome 8 – There is improved contribution to the regional economy from the zone

Narrative: The zone has thriving, and vibrant communities supported by a sustainable local economy based on diverse and productive land and water use. Integrated and sustainable management of the effects of flooding, earthquakes and climate change protects assets and amenities and builds resilience in communities and ecosystems.

Interzone Groundwater Outcome

Outcome 9 – Land and freshwater management in the Waimakariri Water Zone will, over time, support the maintenance of current high-quality drinking water from Christchurch's aquifers

In response to the initial findings of the technical investigations of the groundwater movement between the Waimakariri and Christchurch West Melton water zones, this outcome was also agreed by the zone committee in 2018 as part of development of the Waimakariri Land and Water Solutions programme.

PART C. LAND AND WATER SOLUTIONS PROGRAMME

C1. WHAT IS THE WAIMAKARIRI LAND AND WATER SOLUTIONS PROGRAMME?

The Waimakariri Land and Water Solutions Programme is a first step in setting a direction for water management in the Waimakariri Water Zone. This solutions programme:

- Provides focus and direction for achieving community outcomes for water management in the Waimakariri Water Zone for the next 50 years.
- Sets out a staged approach to achieving community outcomes for water management on a 10 – 20 – 50-year timeframe with regular 10 years reviews to incorporate new information and lessons learned.
- Establishes a monitoring framework to review progress as part of this staged approach.
- Provides recommendations to inform the planning provisions of the Waimakariri chapter of the Canterbury Land and Water Regional Plan.
- Provides a programme of actions to 2030.

WAIMAKARIRI
LAND & SOLUTIONS PROGRAMME

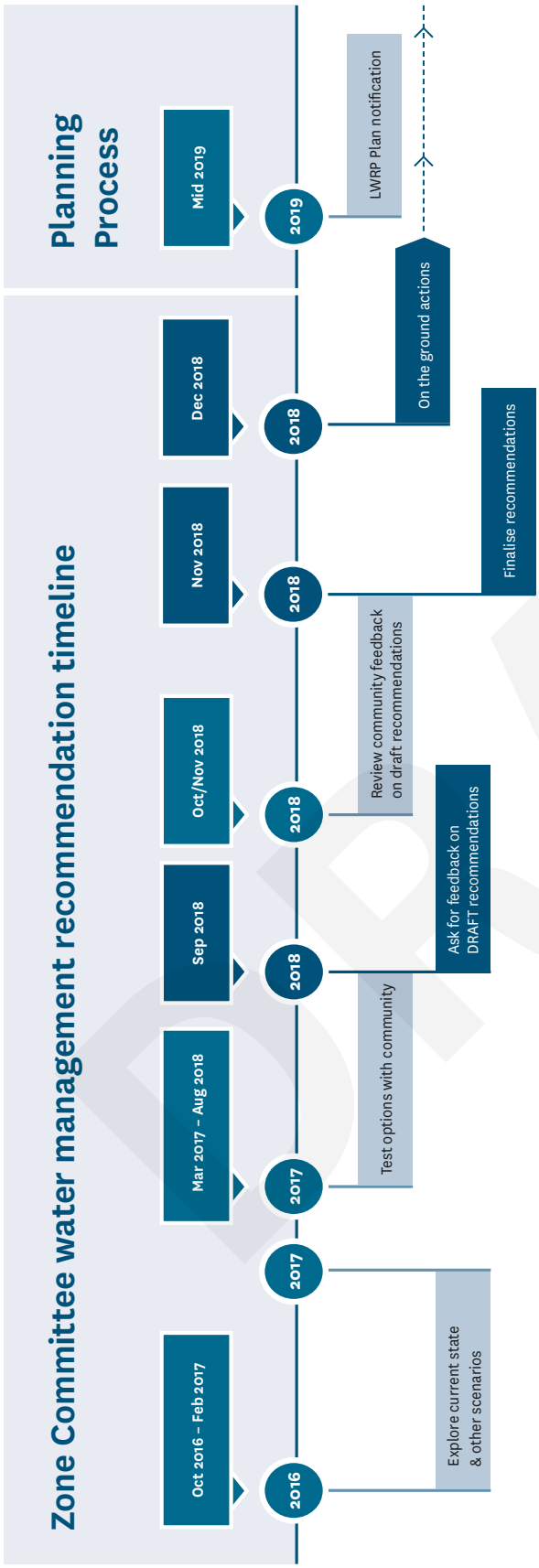


Figure 3.1 – Waimakariri Solutions Programme Timeline

C2. CURRENT STATE AND FUTURE PATHWAYS – TECHNICAL OVERVIEW

Current State Assessment – overview

Environment Canterbury undertook a technical assessment programme from 2015 to 2017 to better understand key biophysical elements (water quality, water quantity, biodiversity and instream ecosystems) and their corresponding influence on cultural, social, recreational and economic values within the Waimakariri Water Zone. These 'current state' assessments focussed on taking a 'snapshot' of these key elements and associated values. The assessments also looked for any historical trends.

As part of the current state assessment two scenarios, 'current pathways' and 'alternative pathways' were also assessed. The 'current pathways' scenario considered likely outcomes assuming no changes to current land-use. The alternative pathways scenario looked at how changing land-use management may impact on environmental, cultural, social, recreational and economic outcomes. Understanding these interactions has informed the Waimakariri land and water solutions programme's development and supported the zone committee to develop the draft ZIP Addendum recommendations.

Current State Assessment – Reports

In 2016 and 2017 Environment Canterbury produced technical assessments for the Waimakariri Water Zone on the following:

- Groundwater quality and quantity
- Water quality and ecology
- Hydrology
- Biodiversity
- Cultural health and water management
- Ashley Estuary (Te Aka Aka) ecology and water quality
- Socio-economic profile
- Recreation
- Economic

To view these reports and more information on the current state assessment for the Waimakariri Water Zone, go to: www.waimakariri-water.nz

Current state key findings

The key findings of the current state technical reports are provided below and discussed in detail in the rest of this overview.

Ngāi Tūāhuriri values

- Many streams and rivers no longer sustain mana whenua values
- Mana whenua are particularly concerned about Cam River/Ruataniwha, Ashley River/Rakahuri, Little Ashley Creek, and Taranaki Creek

Social / Recreational / Economic

- The zone has a unique mix of land uses
- Water supplies for agriculture (irrigation and stockwater) are important for the local economy
- There are close links between Waimakariri and Christchurch City

Environmental

- Changes in land cover since human settlement
- Some areas could be described as water short, normally
- Vulnerable to drought, particularly multi-year dry periods
- Most wetlands have been drained
- Ashley Estuary (Te Aka Aka) is a significant and sensitive environment at the bottom of the catchment
- High sediment loads in many streams and rivers
- Nitrogen concentrations are high in some streams
- Drinking water quality is generally good, but nitrate concentrations are elevated in some wells
- Flows in the Ashley River/Rakahuri have declined over the last few decades. Water levels in wells and flows in spring-fed streams near the Ashley River/Rakahuri have also declined.
- Groundwater levels in Silverstream area and flows in Silverstream are declining
- Groundwater recharge from Waimakariri Irrigation Limited and stockwater race network water losses and inefficient irrigation have offset a large increase in groundwater abstraction

Current Pathways Scenario Assessments – Key Findings

The second stage of the Current State assessment was to explore scenarios based on what might happen if the current state (2016/17) was projected into the future, assuming current land management rules and practices are unchanged. This scenario has been referred to as the Current Pathways scenario. Key findings included:

Ngāi Tūāhuriri values

- Many streams and rivers will fail to sustain Ngāi Tūāhuriri values

Ecology – stream health

- Sea level rise resulting in saltwater intrusion in lowland tidal waterways, coastal retreat and loss of coastal habitat
- Continued overland flow of contaminants (phosphorus, sediment and E. coli)
- Increase in stormwater contaminants
- Continued habitat loss in freshwater and coastal waterbodies

Biodiversity

- Continued decline in extent of high biodiversity value habitats, especially for indigenous forest, broadleaved indigenous hardwood scrub, kanuka and herbaceous freshwater wetland vegetation.
- Projected increase of low biodiversity value habitats such as high producing grassland, orchards and urban areas.

Nitrates

- A groundwater model was used to evaluate the possible range of future nitrate concentrations in water supply wells and surface water bodies. The model was developed collaboratively between Environment Canterbury staff and a panel of external experts and was reviewed by expert panel members on completion. A thorough analysis of the uncertainty around modelled nitrate projections was undertaken, in recognition of the fact that modelled estimates of future water quality outcomes are uncertain.
- Current Pathways modelling results have highlighted the potential for significant nitrate concentration increases in surface water and groundwater in some areas within the Waimakariri Water Zone (e.g. Silverstream and some deep-water supply wells) because of the time it takes for groundwater to travel from the source area (i.e. nitrates already "in the post")
- Groundwater modelling and other investigations undertaken in 2016-2017 concluded that groundwater in the Waimakariri Water Zone is likely to flow under the Waimakariri River and into the Christchurch aquifer system. The Waimakariri Water Zone Committee has made recommendations for nutrient management in their zone, to "play their part" in maintaining the high quality of water in the Christchurch aquifers.
- Permitted activity rules in Plan Change 5 of the LWRP could offset any nitrate reduction gains from Good Management Practice (GMP) and cause significant increases in nitrogen discharges to some sensitive water bodies e.g. Ashley Estuary (Te Aka Aka).

Stream flows

- Reduction in flows, especially Silverstream, Ohoka Stream and Cust Main Drain due to improved irrigation efficiency and increased groundwater abstraction within current allocation limits

Groundwater quantity

- Decrease in water supply well reliability and spring-fed stream flows due to potential increases in groundwater abstraction and improved irrigation efficiency

Possible climate change effects

- Increase in the frequency, duration and severity of droughts causing increased stress on water resources and impacts on stream health
- An increase in evapotranspiration with associated increase in groundwater abstraction, depending on rainfall
- Further flow decreases in the Ashley River/Rakahuri, increasing length and duration of dry reaches in the river and causing reduced flows in the spring-fed streams sustained by losses from the river
- Less snowfall (affects flows in alpine rivers such as the Waimakariri River)
- The potential for less winter rainfall with more rainfall in summer and autumn.

Economic assessment

- Population is expected to increase from current (59,300) to an estimated 97,000 in 2048
- Small increase in agricultural productivity associated with growth in irrigated area, but overall economic gain is offset by removal of productive land into lower producing small-block holdings, and to a lesser extent by the impacts of lower reliability and costs associated with achieving clean drinking water.

C3. PROGRAMME EVALUATION AND MONITORING

The Waimakariri Water Zone Committee is committed to evaluating progress made in implementing the Land and Water Solutions Programme. Various recommendations in this document focus on monitoring and building collective knowledge of the issues, and possible solutions, to improving water management in the Waimakariri Water Zone.

The Water Zone Committee will also develop a 5-year work programme to oversee and evaluate progress in implementing these recommendations. To align with the Land and Water Solutions Programme over the next decade the following approach is proposed:

2019-2021 Solutions Programme – Establishment stage

This will include:

- Initial catchment management plans underway
- Identified actions which can be implemented immediately underway
- Engagement and, where possible, establishment of Water User Groups
- Funding plan for implementation of the programme prepared.

2021-2025 Solutions Programme – 5-year priorities stage 1

- A set of priorities to be achieved by 2025 will be prepared and monitored over a five-year period, to 2025.

2026-2030 Solutions Programme – 5-year priorities stage 2

- Based on a review of progress made to 2025, a revised set of priorities will be prepared to direct progress over the following 5 years, to 2030.

PART D. DRAFT RECOMMENDATIONS

KEY RECOMMENDATION AREAS – DRIVERS OF CHANGE

The following key recommendation areas provide the structure for the solutions programme ZIP Addendum. They are the drivers of change required to achieve community outcomes and address water management issues for the Waimakariri Water Zone.

The zone committee developed the following key recommendation areas in response to issues identified by the current state and future pathways assessments, and overarching community outcomes. This solutions programme is focused on:

1. **Improving Stream Health**
2. **Protecting and Enhancing Indigenous Biodiversity**
3. **Reducing Nitrates**
4. **Managing Surface Water Quantity**
5. **Managing Groundwater Quantity**

D1. RECOMMENDATIONS – IMPROVING STREAM HEALTH

D1.1 Key Issues

The key issues for improving stream health within the zone are:

- There is a need for adequate habitat protection for waterways and riparian habitats that contribute to stream health.
- There is a need for improved data on ecological health in waterways, the influence of specific land uses, and an improved monitoring regime to set priorities and management targets.
- The lowland /plains reaches of waterways in the zone are generally in poor ecological health due to a variety of factors.
- Poor ecological health results in low cultural and recreational values.
- The ecological health of hill country waterways needs to be protected from adverse effects of natural and induced bank erosion, and potential effects of forestry operations.
- There is a need to protect and establish healthy populations and habitats of indigenous plant and animal species across the zone.

D1.2 Rationale

The zone committee proposes a wide range of tools for protecting and improving stream water quality and ecological health. These include practical actions, planning mechanisms, education and support, engagement with industry bodies and extra monitoring effort. Nitrates and stream flows are clearly relevant to stream health and are addressed separately in later sections of this document.

Catchment Management Plans

The zone committee views non-statutory catchment management plans as a critical tool to assist in delivering outcomes on the ground and taking a holistic view of management. The committee will prioritise two catchments to be addressed in the first year following ratification of the ZIPA, and develop plans with support from Environment Canterbury, landowners, Ngāi Tūāhuriri Rūnanga, Waimakariri District Council, farming industry and other organisations. Plans will build on existing initiatives to set out visions for the waterways and identify new actions, lead partners, and funding.

Supporting Good Management Practice

PC5 to the LWRP introduces Good Management Practices (GMP) on-farm into the planning framework through policies, rules and targets in Farm Environment Plans for consented farming activities. It also introduces management plans and targets for farms that do not need resource consent. The zone committee sees Farm Environment Plans and Management Plans as the cornerstone for managing contaminant losses to waterways and for improving biodiversity, stream ecology and mahinga kai through education and support to farmers and landowners.

There are over 3,500 smaller lifestyle properties in the zone, most of which are classified as permitted activities in the Land and Water Regional Plan because of their small size. Collectively these properties can have a cumulative impact on water quality and stream health if not managed well. The zone committee wants to extend a pilot education programme targeted at small block holders and promote the development of Lifestyle Block Management Plans.

Improving environmental monitoring

State of the environment (SOE) monitoring is key to understanding the state and trends of water quality and

ecosystem health in the Waimakariri Water Zone. A successful monitoring programme will include the establishment of a robust and representative network of monitoring sites across a variety of catchment types and areas.

Protecting aquatic biodiversity

The Waimakariri Water Zone contains numerous aquatic species of high ecological, cultural and recreational value. However, many years of land use development has resulted in many species or populations becoming lost or threatened. At risk species include the threatened Canterbury mudfish, lamprey, freshwater mussels, longfin eel and kōura. A key factor contributing to the loss of these species has been habitat loss or degradation.

Stream surveys and investigations have identified numerous barriers to migratory fish passage throughout the zone. These include flood and tide gates, weirs, and culverts. The remediation of such barriers is important to ensuring that the recruitment of individuals into the middle and upper reaches of catchments is allowed.

Protecting natural waterbody character and ecosystem function

Many waterways in the Waimakariri Water Zone have been extensively modified. Spring-fed plains streams have been affected by stream realignments, channel straightening, bank modifications and more. Protecting the natural character of streams can have multiple long-term aesthetic and ecosystem benefits.

Coastal waterbodies

Coastal waterbodies are highly valued ecosystems. They are culturally important and serve as nursery, feeding and resting grounds for a variety of migratory fish species and birds. Located at the bottom of river catchments, they act as basins which capture upstream contaminant inputs. The Ashley Estuary (Te Aka Aka) and tidal reaches of spring-fed plains streams have been particularly affected by habitat degradation associated with excessive sediment deposition. Managing upstream contaminant losses to protect coastal waterbodies downstream is a critical component of any good catchment management plan. Developing a robust monitoring programme for tidal-freshwater and estuarine waterbodies will improve the current poor understanding of ecosystem state and trends. The extent and characteristics of tidally influenced waterbodies are expected to shift with climate change and rising sea levels.

Ashley River/Rakahuri and Saltwater Creek catchment

The zone committee identifies the Ashley River/Rakahuri as an important natural landscape feature. As such, the committee believes it should be safeguarded in its upper-catchment above the gorge, which is an area that has undergone less land use intensification relative to downstream. The Ashley River/Rakahuri (and to a lesser extent the Okuku River) affords many characteristics of an alpine braided river, as defined under the Land and Water Regional Plan. The zone committee wishes its braided river values to be protected.

The braided nature of the Ashley River/Rakahuri channel becomes constrained by terrestrial weed (e.g. gorse, willows, and broom) growth in the mid-catchment and requires extensive weed control to protect its braided river character and bird nesting habitat. The effects of forestry practices in the upper hill-fed catchments of the Okuku and Makerikeri Rivers has caused concern amongst community members, however, limited monitoring makes determining the real effects of such practices downstream difficult.

Spring-fed tributaries of the lower Ashley River/Rakahuri catchment are highly valued by both Ngāi Tūāhuriri and local community. The degradation of these streams is typical of that displayed by most spring-fed waterways in the Waimakariri Water Zone with excessive deposited sediment and poor habitat quality. Water quality in these streams has flow-on effects to downstream aquatic environments, especially the Ashley Estuary (Te Aka Aka).

Northern Waimakariri Tributaries area

Many issues in the Waimakariri Water Zone are centred around the spring-fed tributaries that flow into the Kaiapoi River and eventually the main stem of the Waimakariri River. Unlike other catchments in the zone, the Cam River/Ruataniwha and Kaiapoi River flow through substantial urban populations. For this reason, these waterways receive stormwater inputs that can greatly affect instream water quality. One significant change was the Rangiora sewer ponds ceasing to discharge into the Southbrook, and thus into the Cam River/Ruataniwha, in 2006.

Streams in the Northern Waimakariri Tributaries area are highly valued for their amenity and recreation values, and there is significant scope to rehabilitate degraded reaches of streams. This work has already begun in places such as the Cam River/Ruataniwha catchment. A growing urban population, community education and environmental awareness programmes will also create positive changes in these streams.

Aligned with Community Outcomes

- The water quality and quantity of spring-fed streams maintains or improves mahinga kai gathering and diverse aquatic life
- The Ashley River/Rakahuri is safe for contact recreation, has improved river habitat, fish passage, and customary use; and has flows that support natural coastal processes
- The Waimakariri River as a receiving environment is a healthy habitat for freshwater and coastal species, and is protected and managed as an outstanding natural landscape and recreation resource
- Indigenous biodiversity in the zone is protected and improved
- Optimal water and nutrient management is common practice

D1.4 Draft Recommendations – Improving stream health

Cross-outcome recommendations

Rec 1.1

That Environment Canterbury and the Waimakariri District Council support the Waimakariri Water Zone Committee to prioritise catchments and develop at least two Catchment Management Plans per year. These plans will provide specific catchment management actions, monitoring, and prioritising to support the implementation of ZIP Addendum recommendations.

Rec 1.2

That Environment Canterbury and the Waimakariri Water Zone Committee support industry groups to provide sector, and catchment-specific support to landowners implementing Good Management Practice (GMP), including:

a. sub-catchment groups working to reduce contaminant losses.

b. increasing education and awareness of the Farm Environment Plan audit and accreditation process amongst wider community.

c. educating and supporting landowners to protect catchment-specific ecological, biodiversity and Ngāi Tūāhuriri values by:

   - Preparing catchment management plans to implement on-the-ground waterway remediation projects at sites identified as priorities.
   - As part of the Land and Water Regional Plan – Plan Change 5, Farm Environment Plans and Management Plans identify any areas of significant indigenous biodiversity, as identified by District Council or Department of Conservation, and methods of complying with any District Plan rules.
   - Providing workshops in vulnerable hotspots (i.e. high value or high contaminant loss) areas.

Rec 1.3

That Environment Canterbury promotes the use of Lifestyle Block Management Plans and provides workshops to engage with small block owners to educate and incentivise them to minimise contaminant losses and enhance waterways on their properties.

Monitoring and Research

Rec 1.4

That Environment Canterbury implement a comprehensive waterway monitoring plan for the Waimakariri Water Zone, including:

a. Monitoring sites for water quality and ecological health of waterways:

   - Kaiapoi River and Silverstream sub catchments
   - Cam River/Ruataniwha and tributaries
   - Ohoka Stream
   - Cust River and Cust Main Drain
   - Taranaki Creek, Waikuku Stream, and Little Ashley Creek
   - Ashley River/Rakahuri Gorge
   - Saltwater Creek

b. State of the Takiwā monitoring, including the health and wellbeing of mahinga kai species including:

   - Tuna (freshwater eels)
   - Īnanga (whitebait species)
   - Kākahi (freshwater mussels)
   - Kanakana (lamprey)
   - Kōura (freshwater crayfish)
   - Tuangi (cockles)
   - Pātiki (flounder)

c. Measuring diversity and distributions of freshwater fish, invertebrates and aquatic vegetation throughout the zone.

d. Identifying critical sources areas and measuring deposited sediment extent and character, particularly in spring-fed plains streams (Cam and Kaiapoi rivers) and the Ashley River/Rakahuri – Saltwater Creek Estuary.

e. Including important bathing sites in Schedule 6 of the Land and Water Regional Plan and assess primary recreational water quality at:

   - Ashley River/Rakahuri at Gorge
   - Ashley River/Rakahuri at Rangiora-Loburn Bridge
   - Ashley River/Rakahuri at State Highway 1
   - Kaiapoi River at Kaiapoi township

f. Continue information sharing and integrate monitoring programmes between organisations, and promote community-based monitoring of waterways (citizen science) and education initiatives

g. Investigate the ecosystem health of hill country waterways to identify issues and catchment-specific management options as required.

h. Support ongoing research into emerging contaminants, including endocrine disruptors, in the Waimakariri Water Zone.

i. Investigate tidal waterbodies related to:

   a. Sediment deposition and salt water intrusion in:
      - Ashley River/Rakahuri – Saltwater Creek Estuary
      - Tidal reaches of Kaiapoi River, Saltwater Creek and Taranaki Creek
   b. Aquatic habitat shifts associated with climate change and sea level rise, including changes in īnanga spawning areas.

Rec 1.5

That Environment Canterbury and Waimakariri District Council investigate the impact of wilding pines on downstream freshwater ecosystems by monitoring streams and rivers with wilding pines in their catchments.

Rec 1.6

That Environment Canterbury and Waimakariri District Council investigate the impact of commercial forestry practices on downstream freshwater ecosystems by monitoring streams and rivers with production forestry in their catchments.

Rec 1.7

That Environment Canterbury and the Waimakariri District Council support further research into factors that influence and/or control toxic cyanobacteria growth in the Ashley River/Rakahuri.

Rec 1.8

That Environment Canterbury and the Waimakariri District Council support a robust monitoring programme that measures and reports regularly on water quality in urban streams and rivers.

Protecting and enhancing aquatic biodiversity

Rec 1.9

That Environment Canterbury remove or retrofit barriers to fish passage where:

a. Barriers are not important for protecting vulnerable non-migratory native fish populations from predation by introduced fish species, or

b. Tide and flood-gates impede fish migration (including the maintenance and operation of gates on the following waterways):
   - Taranaki Creek
   - Silverstream
   - Cam River/Ruataniwha
   - Waikuku Stream
   - Courtenay Stream
   - Kairaki Creek

Rec 1.10

That Environment Canterbury work with Ngāi Tūāhuriri to identify the types of activities and controls needed to protect the aquatic habitat of the threatened Canterbury mudfish and amend plan provisions to ensure protection at sites including the following:

- Tutaepatu Lagoon
- Taranaki Creek
- Eyre River tributaries
- Coopers Creek tributaries
- Mounseys Stream tributaries

Rec 1.11

That Environment Canterbury work with Ngāi Tūāhuriri to identify the locations and types of activities and controls needed to protect the habitat of important indigenous species including:

- Freshwater crayfish/kōura
- Freshwater mussels/kākahi
- Lamprey/kanakana

Protecting and enhancing aquatic ecosystem health

Rec 1.12

That Environment Canterbury resource and support catchment management plans implementing on the ground projects targeted at rehabilitating the freshwater or estuarine habitats of threatened species or species of high value to Ngāi Tūāhuriri.

Rec 1.13

That Environment Canterbury support further work on the issue of lost ecological and cultural values resulting from waterway realignment and advise of relevant changes from a future region-wide plan change.

Rec 1.14

That Environment Canterbury support catchment management plans that promote bank stabilisation and reduce sediment inputs to spring-fed plains waterways including, but not limited to:

- Cam River/Ruataniwha
- Taranaki Creek
- Silverstream

Rec 1.15

That Environment Canterbury and Waimakariri District Council ensure waterway and drain clearing management activities follow best practice guidelines to minimise contaminant losses to downstream waterbodies and loss of aquatic life in drains, while maintaining flood carrying capacity.

Rec 1.16

That Environment Canterbury ensure rules excluding intensively farmed stock from waterbodies be extended to include:

- All springheads that permanently or intermittently contain water; and
- All open drains and other artificial watercourses, (including but not restricted to irrigation canals and water races) with surface water in them that directly discharge into a stream, river or lake.

Rec 1.17

That Environment Canterbury ensure rules excluding stock from waterbodies include non-intensively farmed cattle (including dryland cattle) from spring-fed waterways and their tributaries on the plains, drains and artificial watercourses.

Rec 1.18

That Environment Canterbury develop guidance on preventing horse access to waterways.

Rec 1.19

That Environment Canterbury and the Waimakariri District Council support landowners with education and guidance on appropriate riparian set back distances and plantings for different situations, including on potential linkages along the waterways and other parts of the catchment and for managing critical source areas.

Rec 1.20

That Environment Canterbury and the Waimakariri District Council work with the forestry sector to identify high risk periods over the next 5 years when earthworks and harvesting will take place within the Waimakariri zone so resources can be targeted to ensure potential environmental effects are mitigated or avoided.

Ngāi Tūāhuriri values and aquatic ecosystems

Rec 1.21

That Ngāi Tūāhuriri, Te Rūnanga o Ngāi Tahu, Environment Canterbury, and Waimakariri District Council work together to identify areas and waterways of high cultural value and options for protecting those values including providing for mahinga kai and the protection of wāhi tapu and wāhi taonga within the Waimakariri Zone.

Rec 1.22

That Environment Canterbury prioritise on the ground projects for Taranaki Creek, given its significant value to Ngāi Tūāhuriri and proximity to Kaiapoi Pā, particularly those related to:

- reducing and removing sources and legacies of deposited fine sediment
- improving the quality of habitat for mahinga kai species
- removing barriers to native fish passage
- removal of invasive fish species

Ashley River/Rakahuri and Saltwater Creek catchment

Rec 1.23

That Environment Canterbury and the Waimakariri District Council recognise the Ashley River/Rakahuri for its important natural landscape values, braided river characteristics, and braided river bird (nesting) habitat.

Rec 1.24

That Environment Canterbury provide funding for projects to address key environmental issues in the River, particularly the removal of woody weeds above the confluence with the Okuku River.

Rec 1.25

That Environment Canterbury and the Waimakariri District Council recognise the Upper Ashley/Rakahuri catchment, including Lees Valley, for its high natural landscape and ecosystem values, and protect its waterways from degradation by:

- avoiding increased contaminant losses to waterways
- preventing the removal or degradation of any existing wetlands
- preventing the expansion of wilding pines

Urban waterways

Rec 1.26

That Environment Canterbury and the Waimakariri District Council support public education and awareness initiatives aimed at improving the water quality and health of urban waterways

Project support

Rec 1.27

That Environment Canterbury and the Waimakariri District Council support projects that have enduring benefits for improved stream health, Ngāi Tūāhuriri values, and improved recreational amenity in the North Waimakariri catchment.

Rec 1.28

That Environment Canterbury and the Waimakariri District Council prioritise on the ground projects in the Cam River/ Ruataniwha and Silverstream, including but not limited to:

- Reducing and removing sources and legacies of deposited fine sediment.
- Improving the quality of habitat for mahinga kai.
- Removing barriers to native fish passage.

D2. RECOMMENDATIONS – PROTECTING AND ENHANCING INDIGENOUS BIODIVERSITY

D2.1 Issues

- Indigenous habitats and ecosystems across the zone have been highly modified by rural and urban land and water uses; this includes terrestrial, freshwater and estuarine environments. Modification continues, but through a lack of base-line information there is little data on rates of change at a catchment or site level.
- Various nationally and locally rare plant and animal species occur in the zone, but there is no comprehensive information about abundance or distribution.
- There is increasing awareness about protection of significant indigenous vegetation and habitats. However, many species occur in isolated remnants which require an integrated approach to indigenous biodiversity management (for example, through a catchment or landscape plan)
- Plant and animal pests threaten indigenous biodiversity values in many parts of the zone.

- Indigenous plants are used for planting in riparian areas and on other areas of private land. Landowners carrying out indigenous biodiversity protection and enhancement work on riparian (and terrestrial habitats) often work in isolation. Better biodiversity outcomes could be achieved if:
  - ecological connections with riparian reaches up and downstream have already been described, and biodiversity and critical source management targets set (for example through a catchment or landscape plan)
  - landowners could access good biodiversity information, support, advice and plant material.
- The links between cultural, landscape and amenity values are not well documented in this zone, which makes integrated management difficult to achieve.
- The effects of the earthquakes and of climate change create uncertainty about biodiversity change.

D2.2 Rationale

The Current State assessment highlighted the need for short and longer-term actions to protect and enhance indigenous terrestrial, freshwater and estuarine biodiversity in the zone. The zone committee's recommendations seek to:

- Protect significant biodiversity values.
- Integrate indigenous biodiversity management into wider aspects of land and water management by all land owners and managers.
- Integrate indigenous biodiversity values and management within the proposed catchment management plans.
- Create a "vision" for indigenous biodiversity which integrates investigations and actions.
- Develop a strong regulatory and voluntary framework for indigenous biodiversity management in the zone.
- Engage and support private landowners to work with Ngāi Tūāhuriri, Environment Canterbury, Waimakariri District Council, DOC and stakeholders on indigenous biodiversity action.
- Gather data and information to help prioritise actions and set regulation.

Aligned Community Outcome

- Indigenous biodiversity in the zone is protected and improved

D2.3 Draft Recommendations – Protecting and enhancing Indigenous Biodiversity

Cross-outcome recommendations

Rec 2.1

The Zone Committee recommends that Environment Canterbury and the Waimakariri District Council integrate indigenous biodiversity in a whole of waterway, Ki Uta Ki Tai, approach to managing catchments.

Rec 2.2

The Waimakariri Water Zone Committee endorses and supports the implementation of the Canterbury Regional Biodiversity Strategy as it applies in the Waimakariri Water Zone. In particular:

a. The zone committee endorses the vision, goals, targets, and actions of Canterbury Regional Biodiversity Strategy:

b. The zone committee recommends that Environment Canterbury support the appointment of a regional co-ordinator for the Canterbury Regional Biodiversity Strategy

c. The zone committee recommends that Waimakariri District Council increase its biodiversity capability and capacity

Rec 2.3

The zone committee recommends that in implementing the Canterbury Biodiversity Strategy, at the water zone level, including the development of a Waimakariri Biodiversity Strategy to enable the following actions:

- Developing and illustrating a vision for indigenous biodiversity (and related values) across the zone
- Mapping indigenous habitats, vegetation and, as appropriate, threatened plant and animal species in the zone
- Identifying actions for protection and enhancement of indigenous habitats, vegetation types and plant and animal species
- Identifying priority sites, waterways, springheads, wetlands, reaches or locations for protection
- Identifying priority habitats and vegetation for management actions
- Setting targets for biodiversity protection and enhancement in the zone

Rec 2.4

That Environment Canterbury and the Waimakariri District Council consider climate change and sea level rise impacts on indigenous biodiversity in the Waimakariri Water Zone.

Protecting and enhancing ecosystem health

Rec 2.5

That Environment Canterbury and the Waimakariri District Council integrate indigenous biodiversity and instream ecological values into Council's planning and operational activities, including in work carried out by consultants or contractors.

Ngāi Tūāhuriri values and indigenous biodiversity

Rec 2.6

The Zone Committee endorses the Land and Water Solutions Programme projects such as "Te Aka Aka Connections" to reconnect coastal ecosystems between the Lower Ashley River/Rakahuri, the estuary and Te Aka Aka Fenton Reserve and recommends Environment Canterbury and the Department of Conservation work with and support Ngāi Tūāhuriri Fenton Reserve Trustees

in restoring the Te Aka Aka Fenton Reserve to provide for mahinga kai benefits for Ngāi Tūāhuriri Rūnanga.

Ashley River/Rakahuri and Saltwater Creek

Rec 2.7

The zone committee recommends that Environment Canterbury and the Waimakariri District Council work with Ngāi Tūāhuriri, landowners, agencies and stakeholders to protect and enhance the indigenous biodiversity and landscape values in the Lees Valley/Upper Ashley sub-catchment, Lower Ashley sub-catchment and the Ashley River/Rakahuri.

Protecting and enhancing terrestrial and aquatic indigenous biodiversity

Rec 2.8

That Environment Canterbury and the Waimakariri District Council work with community groups to address indigenous biodiversity protection and enhancement (e.g. kānuka / dry grassland habitat on the plains, braided riverbed birds) such as:

- Provision of administrative support;
- Provision of financial assistance; and
- Endorsing projects

Rec 2.9

That Environment Canterbury and the Waimakariri District Council, together with Ngāi Tūāhuriri, DOC and other agencies assist landowners/land managers by:

- Establishing a free biodiversity advisory service (e.g. advice on appropriate plant sources or riparian planting)
- Advising on indigenous biodiversity management as part of farm management planning within catchment plans
- Publicising positive biodiversity actions, events and news
- Promoting and raising awareness of biodiversity values and protection or enhancement opportunities.
- Investigating the development of a system to ensure appropriate sources of plant material for revegetation and enhancement projects.
- Promoting and advising on appropriate wetland habitat and waterway protection.
- Investigating the current role and opportunities through small block management for indigenous biodiversity management

Rec 2.10

That Environment Canterbury and the Waimakariri District Council review consenting options to support landowners to undertake indigenous biodiversity initiatives including, but not restricted, to:

- habitat protection and enhancement
- predator control of high values sites
- revegetation projects

Rec 2.11

That Environment Canterbury and the Waimakariri District Council review options to support landowners to undertake indigenous biodiversity initiatives on marginal land and setbacks.

Coastal habitats and ecosystems

Rec 2.12

The zone committee recognises the importance of the tidal reaches of waterways as īnanga habitat (e.g. the Kaiapoi River) and recommends that Environment Canterbury and the Waimakariri District Council support the development of habitat at īnanga spawning sites and riparian planting.

Rec 2.13

The Waimakariri Water Zone Committee acknowledges the Ashley Estuary (Te Aka Aka) as a taonga within the Waimakariri Zone and recommends the establishment of a working group comprising representatives of Ngāi Tūāhuriri, Environment Canterbury, Waimakariri District Council, Department of Conservation, Fish and Game and other agencies to develop a strategy and programme to protect and enhance Ngāi Tūāhuriri, biodiversity and recreational values in the face of current pressures, climate change and rising sea levels.

Rec 2.14

That Environment Canterbury undertake a programme of investigations and monitoring in the Ashley Estuary (Te Aka Aka) to provide information for the working group's deliberations. The programme should include:

- Determination of eutrophication susceptibility. This requires determining the flushing potential, the dilution potential, nutrient inputs and nutrient load susceptibility
- Development and implementation of a programme to assess current trophic state and to monitor trophic state over time (important considerations are location of sites, parameters to be measured, frequency of sampling, seasonality of sampling)
- Annual mid-summer broad-scale monitoring to assess the occurrence of macro-algae.
- Monthly water quality monitoring for ecosystem health at the site near the estuary mouth.
- Five-yearly monitoring of sediment quality at two sites – present site adjacent to Saltwater Creek and downstream from SH1 and a site in proximity to where Taranaki Creek flows into the Ashley Estuary (Te Aka Aka).
- Monitoring of cockles and pipis from sites in the estuary to assess for E. coli concentrations in shellfish flesh.
- Establish stations at various locations in the estuary and begin to monitor sedimentation.
- Annual monitoring of the sediments and macrobiota at one site within the estuary.
- Baseline surveys of the fish and bird populations of this estuary.

D3. RECOMMENDATIONS – REDUCING NITRATES

D3.1 Key Issues

Nitrates are one of the key contaminants that affect the quality of groundwater and surface water. They have been identified as a key issue for the Waimakariri Water Zone, most significantly in the Kaiapoi River catchment.

Nitrates are currently likely to exceed the nitrate drinking water standard in an estimated 100 private drinking water wells in the water zone (see Map X5). This could increase to over 400 wells based on modelling of current trends. Some community water supply wells may need to be treated, or alternative sources found, to address nitrate issues in the future.

Groundwater Investigations – Northern Waimakariri Catchment

Modelling indicates nitrates in groundwater sourced from a portion of the North Waimakariri catchment may travel under the Waimakariri River towards Christchurch aquifers (See Map X6).

This groundwater travel may result in nitrate levels in deep groundwater in the Christchurch aquifer slowly increasing over 50 to 100 years. Any increase in nitrates is likely to be to levels below the maximum acceptable value defined in the New Zealand Drinking Water Standards.

Waimakariri River northern tributaries

Of greatest concern for the water zone committee are the high and upward trends in nitrate concentrations in the Silverstream.

High but declining trends have been assessed in the Cust Main Drain and Ohoka Stream, with moderate and low nitrate concentrations assessed for Courtenay Stream and Cam River/Ruataniwha, respectively (See Map X7).

Nitrate concentrations in streams and groundwater could increase in the future due to increased irrigation efficiency, particularly if the additional water made available by more efficient irrigation is used to irrigate more land.

Ashley River/Rakahuri Catchment

Ashley River/Rakahuri at the gorge currently experiences minor cyanobacteria and algal blooms. Increased nitrate losses could intensify nuisance growths through this highly valued habitat and recreational area.

Ashley Estuary (Te Aka Aka) is rated as highly to very highly susceptible to macroalgal eutrophication based on modelling of current nitrogen loads. This places significance stresses on the aquatic ecosystem.

National Limits for Nitrate

The following table provides an overview of the nitrate limits the Water Zone Committee, Environment Canterbury and the Waimakariri District Council must address.

Drinking Water Standard		
½ Maximum Allowable Value (MAV) – 5.65 mg/L		*Drinking Water Standards for New Zealand 2005 (revised 2008)*
Maximum Allowable Value (MAV) – 11.3 mg/L		
Biodiversity and Ecosystem Health – Nitrate Toxicity Limits		
6.9 mg/L	Protect 80% aquatic species from chronic effects of nitrate toxicity. National bottom line for nitrate toxicity.	*National Policy Statement for Freshwater Management (updated 2017)*
3.8mg/L	Protects 90% aquatic species from chronic effects of nitrate toxicity.	
2.4 mg/L	Protects 95% aquatic species from chronic effects of nitrate toxicity.	
1.0 mg/L	Protect 99% aquatic species from chronic effects of nitrate toxicity.	
Ngāi Tūāhuriri Values		
1.0 mg/L	Cultural Opportunity Mapping Assessment and Response (COMAR) - Current State report	

Table 3.1 New Zealand Nitrate Limits

D3.2 Rationale

1. Approach to managing nitrates in groundwater and surface water

The committee considers that management of land and water use is the main mechanism by which nitrate targets in groundwater and surface water should be achieved. Although other measures such as stream augmentation and managed aquifer recharge may play a part in the future, the feasibility of these measures have not yet been proven to the point at which they can be "banked upon" as part of the nitrate solution for the Waimakariri Water Zone.

2.Science information

Measured nitrate concentrations in some surface and groundwater bodies within the zone currently exceed the plan limits recommended by the committee. Furthermore, modelling results indicate that in future, for some streams and aquifers, nitrate concentrations currently below the zone committee's recommended limits for those waterbodies are likely to increase above the plan limits at least for a time (lag effect).

The zone committee has based its recommendations on the best scientific and economic information currently available. The committee recognises that the nitrate contamination of both surface and groundwater operates within a complex system and that information and understanding needs to continue to evolve. The committee, however, acknowledges there is enough information on which to act now. Inaction is not an option and could ultimately come at a significant cost to current and future generations.

The zone committee recognises that model-based projections of future water quality are often associated with a high degree of uncertainty. This uncertainty has been evaluated and carefully considered by the committee when making recommendations about nitrate management in the zone. The committee has generally chosen to use the median nitrate concentration from the modelled range to determine the nitrate loss reductions required to meet their recommended limits. Use of the median value recognises that the likelihood of the true value being greater than this value is the same as the likelihood of the true value being less than this median value. By using the median value, the committee considers that the likelihood of excessive economic impacts on farming (where the true future concentration proves to be less than the modelled value) is balanced against the likelihood of excessive environmental impacts (where the true future concentration proves to be greater than the modelled value). In the case of community water supply wells, the committee recommends that the 95th percentile model results should be used to determine the nitrate loss reductions required to meet their recommended limits for these wells. Use of the 95th percentile provides a greater level of certainty that the nitrate limits will be achieved.

3. Nitrate limits

The zone committee considered a range of possible nitrate plan limits from 1.0 mg/L to 6.9 mg/L nitrate-N for most rivers and streams, with lower limits in the Ashley River/Rakahuri and Waimakariri River. The effects of different limits on stream health and associated Ngāi Tūāhuriri values were considered. Economic and social impacts were also considered, particularly when the zone committee looked at how quickly limits could be achieved.

For community drinking water supplies and private wells the committee considered the New Zealand Drinking Water Standards and ½ MAV threshold that alerts operators to a possible emerging problem. A precautionary limit of 3.8 mg/L was also considered and eventually recommended as the limit guiding nitrate reductions for the source area potentially associated with the Christchurch aquifer (See Map X6).

The zone committee has recommended plan limits that are challenging but feasible, given current knowledge and tools available. The limits also meet requirements in the National Policy Statement for Freshwater Management.

Some of the recommended plan limits represent a compromise and do not go as far as the zone committee might ideally prefer. So, for some waterbodies, the zone committee has identified future goals. These are nitrate concentrations that are not recommended as plan limits for this sub-region plan change (due to uncertainty about a feasible pathway) but which could eventually be achievable. The zone committee expects the future goals listed in this ZIP Addendum to be revisited by Environment Canterbury during the 10-year plan review, and where possible, included in a future plan change as plan limits.

Specific timeframes for achieving plan limits are needed for this sub-region plan change. The zone committee wants to see the limits achieved as quickly as possible, but it wants to avoid over-promising and under-delivering. For this reason, the timeframes should be based on the number of stages of on-farm nitrate loss reductions necessary to achieve the limits.

This should not be read as an endorsement of long timeframes for achieving limits. The zone committee is looking for potential future mitigations such as managed aquifer recharge to allow nitrate plan limits to be achieved much more quickly. It also expects to see faster improvements across a broad range of water quality, habitat and mahinga kai indicators through implementation of on-farm GMPs, and through practical actions under catchment management plans.

4. Priority management areas

The zone committee understands that whilst elevated nitrate concentrations are influencing stream health and Ngāi Tūāhuriri values across much of the zone, sediment, phosphorus and E. coli are having a more significant adverse impact in some waterways. These three contaminants can be transported into surface water bodies by runoff from farm land, lifestyle blocks and in urban stormwater. Careful runoff management is required to address them. The committee has therefore defined a Nitrate Priority Management Area (Map X8), which encapsulates land where special measures are required to manage nitrate as the first priority, and a Runoff Management Area (Map X8), where sediment, phosphorus and/or E. coli. are likely to be having a greater overall adverse impact than nitrate and hence careful management of runoff is top priority.

5.Direction of travel for the Nitrate Priority Management Area

The zone committee recognises that nitrate concentrations will increase in some water bodies if we continue current land management practices within the Nitrate Priority Management Area. The zone committee has heard the community and Ngāi Tūāhuriri Rūnanga voice their desire to improve water quality to levels that sustain ecosystem health and customary values and practices (i.e. collection of abundant and safe mahinga kai) as quickly as possible.

The zone committee has tried to find a balance between moving as fast as possible toward ecosystem health and cultural outcomes while at the same time providing for a future that supports the communities and lifestyles of Waimakariri and giving due consideration to the uncertainty around modelled projections of future nitrate concentrations.

The zone committee has also considered how best to avoid unreasonable impacts on low nitrate loss farming activities. Initially, the zone committee consulted on the idea of a nitrate loss rate "floor" below which further reductions beyond baseline GMP are not required. Unfortunately, OVERSEER® version changes make this option difficult to implement. So, the zone committee is considering a simpler approach where low nitrate emitters outside the Nitrate Priority Management Area are not required to achieve reductions below baseline GMP.

6. A staged approach to setting and achieving limits in the Nitrate Priority Management Area

The committee recommends an approach that sets out nitrate reductions to be achieved in stages over time that will ultimately achieve nitrate concentrations that support ecosystem health, and that restore Ngāi Tūāhuriri values. The committee is very conscious of the significant changes to land and water management being signalled in these recommendations and acknowledge that landowners will need time to make necessary adjustments to their farm practices and, in many instances also to their on-farm capital investments. To provide certainty, the baseline GMP operative at the notification of this plan change is a fixed starting point for the recommended first stage and any future reductions.

The committee is also aware that nitrates are already in the system and hence concentrations may increase for the next decade or two, despite actions being taken by current landowners now.

The committee recognises that for some waterbodies, planning provisions alone will not achieve ecosystem health and Ngāi Tūāhuriri objectives within a generation. Other actions (e.g. riparian fencing and planting) need to begin immediately and new tools and techniques need to be developed and trialled to see whether they are effective in the Waimakariri Water Zone. These include techniques being developed by the University of Canterbury CAREX research programme, managed aquifer recharge and research on soil nitrate attenuation. The committee has therefore recommended a package of regulatory and non-regulatory actions to achieve the required water quality and mahinga kai outcomes.

The committee has set out a series of 10-year steps that coincide with anticipated review periods of the Waimakariri section of the Land and Water Regional Plan as well as land use consent renewals in the zone. This approach provides an opportunity to adapt the steps in response to new information, tools and management practices.

The committee believes that it has set challenging but achievable steps.

Some water bodies may require more steps and more time will be needed as there is a substantial gap between projected nitrate concentrations and the recommended plan limit. Nitrate limits for other waterbodies, such as the Cam River/Ruataniwha, will be achievable more quickly.

The zone committee would like to see the limits it is recommending achieved sooner than the multi-decadal dates likely to be set in the plan for some waterbodies and will be actively working with others to make this happen.

The zone committee supports land use consents with a 10-year duration and common expiry dates that align with anticipated plan reviews. This will facilitate better management of nitrate losses within the zone and allow for new information to inform the setting of future stages of nitrogen reductions.

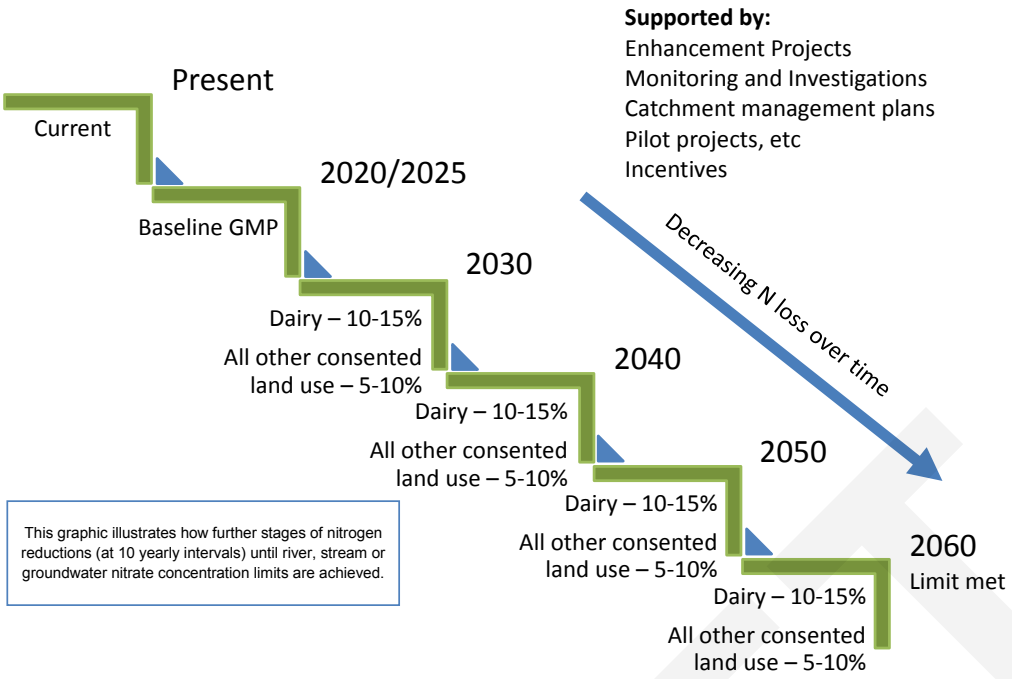


Figure 3.2 Proposed Staged Approach to Nitrate Reductions

7. What does Baseline Good Management Practice (Baseline GMP) look like?

Good Management Practices are the practices described in the document "Industry-agreed Good Management Practices relating to water quality" dated 18 September 2015.

The Baseline Good Management Practice Loss Rate is the average nitrogen loss rate below the root zone, as estimated by the Farm Portal , for farming activity carried out during the nitrogen baseline period (2009-2013) as if it were operated at good management practice.

Under Plan Change 5 farms in red nutrient zones which require resource consent are generally required to adhere to their "Baseline GMP" nitrogen loss limit from 2020. In orange nutrient zones, farms can apply for resource consent to exceed their Baseline GMP Loss Rate.

8. Nutrient allocation zones

The Waimakariri Water Zone is already subject to "nutrient allocation zones" established during the development of the original Land and Water Regional Plan:

- A narrow area adjacent to the Waimakariri River is classified "green" (least restrictive nutrient management rules, allows for some intensification)
- Much of the Northern Waimakariri Tributaries area is classified "red" (most restrictive), including most of the source area modelled as contributing groundwater flow below the Waimakariri River towards Christchurch
- The Ashley/Rakahuri catchment is "orange" (similar to red but slightly less restrictive).

The zone committee received very detailed technical information that was not available when the nutrient allocation zones were set during the development of the Land and Water Regional Plan. In response to that information, the zone committee recommends a precautionary approach by managing risks associated with green and orange zone rules.

Using Plan Change 5 red nutrient zone rules as a foundation for the whole zone would better manage the risks from permitted and consented increases in nitrate loss and better protect the ecological health of rivers and the Ashley Estuary (Te Aka Aka), which is susceptible to even small increases in nitrogen load.

The zone committee also recommends adjusting the Waimakariri sub-region boundary in the Land and Water Regional Plan to take in part of the green nutrient zone bordering the Waimakariri River that is currently within the Central Canterbury Alpine Rivers section of the plan (See Map B2). This area would then be subject to the restrictions recommended for the Nitrate Priority Management Area.

9. Runoff priority management area

The Zone Committee has recommended farmers in the Runoff Priority Management Area (see Map X6) are not required to go beyond Baseline GMP reductions. Actions required to improve stream health through runoff management in this area are discussed in Section D1.

Aligned with Community Outcomes

- The water quality and quantity of spring-fed streams maintains or improves mahinga kai gathering and diverse aquatic life.
- The Ashley River/Rakahuri is safe for contact recreation, has improved river habitat, fish passage, and customary use; and has flows that support natural coastal processes.
- The Waimakariri River as a receiving environment is a healthy habitat for freshwater and coastal species and is protected and managed as an outstanding natural landscape and recreation resource.
- Indigenous biodiversity in the zone is protected and improved.
- Optimal water and nutrient management is common practice.
- There is improved contribution to the regional economy from the zone.

D3.3 Draft Recommendations – Reducing nitrates

Direction of Travel

Rec 3.1

That Environment Canterbury reflect in the Waimakariri section of the Land and Water Regional Plan a staged approach over time to nitrate reduction in the Waimakariri Water Zone.

Rec 3.2

The requirements for landholder water quality management actions in the Waimakariri Water Zone should be optimised to deliver the greatest overall water quality benefit. Two management units are proposed for this purpose: a Nitrate Priority Management Area and a Runoff Priority Management Area.

Rec 3.3

The Waimakariri Water Zone Committee proposes Baseline GMP as the starting point for nitrate reductions from 1 July 2020 (or 2025 for consent held until this date). Baseline GMP is the average nitrogen loss rate, estimated by the Farm Portal, for the farming activity carried out during the baseline period of 2009-2013, if operated at good management practice.

Rec 3.4

Dairy in the Nitrate Priority Management Zone should achieve a 10-15% beyond Baseline GMP reduction by 2030

Note: the zone committee did not reach consensus on this recommendation with the majority having a preference for the above recommendation. An alternate view was for a 25% beyond Baseline GMP reduction by 2030.

Rec 3.5

All other consented farming activities should achieve a 5-10% beyond Baseline GMP reduction by 2030.

Rec 3.6

The nitrate loss reductions in recs 3.4 and 3.5 above should be repeated every 10 years until the nitrate reductions necessary to achieve the plan limits have been met, or until the science information available at that time shows that the plan limit is likely to be met in the future without the need for further reductions.

Rec 3.7

The zone committee encourage industry and local authorities to provide incentives to achieve nutrient reductions greater than the recommended reductions in this draft ZIP Addendum.

Rec 3.8

The zone committee recommends the plan change includes policy criteria that allow for and guides consideration of extensions to the 2030 target date for beyond baseline GMP reductions in exceptional circumstances.

Rec 3.9 All farms located within the Runoff Priority Management Area should ensure farming practices reduce overland flow losses of phosphorus, sediment and E. coli.

Low Nitrate Emitters

Rec 3.10 The zone committee recommend that farmers in the Runoff Priority Management Area are not required to achieve beyond Baseline GMP reductions.

Permitted Activity Threshold

Rec 3.11 The Waimakariri Water Zone Permitted Activity winter grazing allowances should be reduced across the whole Waimakariri Water Zone to minimise the potential for further nitrate increases in streams and groundwater. The following winter grazing PA property size thresholds should be implemented:

Property sizes:

- less than 5 ha do not require consent for winter grazing;
- Between 5 ha and 1,000 ha can use up to 5% of property size for winter grazing without triggering a consent requirement; and
- greater than 1,000 ha can use up to 50 ha for winter grazing without triggering a consent requirement.

Rec 3.12

That Environment Canterbury runs an education campaign (including workshops) promoting the management plan requirements, and proactively checks compliance with those requirements to confirm that the good farming practice actions are being implemented. The committee could seek resources to be allocated for this task in the next Long-Term Plan Review.

Waimakariri Sub-region Boundary

Rec 3.13

The zone committee recommends that the Waimakariri sub-region plan boundary in Section 8 of Land and Water Regional Plan is amended to incorporate land bordering the Waimakariri River which contributes groundwater flow and nitrates to Christchurch deep aquifers. This land, which is currently within the Central Canterbury Alpine Rivers (Section 12) of the Land and Water Regional Plan and classified as a green nutrient allocation zone, should be subject to plan provisions determined for the Nitrate Priority Management Area.

Nutrient Allocation Zone Rules

Rec 3.14

Plan Change 5 nutrient allocation zone rules for red zones are used as a foundation for managing nutrients across the whole Waimakariri Water Zone, combined with amendments to the permitted activity winter grazing consent thresholds, and additional nitrate loss reductions in the Nitrate Priority Management Area described in other recommendations.

Nitrate Limits for Community Drinking Water Supplies

Rec 3.15

That Environment Canterbury reflect in the Waimakariri section of the Land and Water Regional Plan the nitrate limits in the drinking water supply wells of Waimakariri Water Zone as set out in the table below

1. Private water supply well areas are shown in Map X5, appended

Drinking Water Source	Current concentration (mg/L)	Current Pathways concentration (mg/L)	Recommended Plan Limit (mg/L)	Future goal (mg/L)	Notes
Individual Waimakariri District Council community water supply wells	0.02 – 9.0	1.9 (Waikuku) to 8.1 (Mandeville)	5.65	-	*Limit applies to all water samples collected from community water supply wells*
Private water supply wells	0.05 – 26.0 (individual wells) 0.8 – 5.2 (averages across water supply well areas)	1.3 (Waikuku) to 8.4 (Swannanoa)	5.65	-	*50% of all samples collected from each private water supply well area1 in any year should meet the limit*
Christchurch community supply wells (deep) – long term 50 to 100 years	0.05 – 2.6 (individual wells >80 m deep) 0.6 (average of all wells >80 m deep)	4.7 (deep aquifer, central Christchurch)	3.8	1.0	*Average nitrate concentration in all samples collected from wells > 80 m deep should meet the limit*

Table 3.2 Community Drinking Water Supplies – Nitrate-N Limits

Nitrate Limits for Private Well supplies

Rec 3.16

That Environment Canterbury, Waimakariri District Council and Canterbury District Health Board work together to raise awareness of health impacts from high nitrates in drinking water.

Rec 3.17

Environment Canterbury and Waimakariri District Council should consider provision of guidance and information regarding a minimum depth for new water supply wells, to provide better protection against microbial contamination.

Nitrate Limits for Streams and Rivers

Rec 3.18

That Environment Canterbury reflect in the Waimakariri section of the Land and Water Regional Plan the nitrate limits in the streams and rivers of the Waimakariri Water Zone as set out in the tables below.

Ashley / Rakahuri catchment – Stream/River	Current concentration (mg/L)	Current Pathways concentration (mg/L)	Recommended Plan Limit (mg/L)
Saltwater Creek	0.7	0.8	1.0
Waikuku Stream	1.2	1	1.0
Taranaki Creek	1.2	1.1	1.0
Little Ashley Creek	N/A	N/A	***1.0***
Ashley River/Rakahuri at Gorge	***0.2***	***0.2***	***0.2***
Ashley River/Rakahuri at SH1	***0.3***	***0.3***	***0.3***

Table 3.3 Ashley/Rakahuri Catchment – Nitrate-N Limits

North Waimakariri catchment – Stream/River	Current concentration (mg/L)	Current Pathways concentration (mg/L)	Recommended Plan Limit (mg/L)	Future goal (mg/L)
Silverstream at Harpers Rd	9.4	13.8	6.9	***3.8***
Silverstream at Island Rd	5.4	9.5	6.9	***3.8***
Courtenay Stream	3.1	4.7	3.8	-
Ohoka Stream	4.5	7.0	***3.8***	-
Cust Main Drain	***4.7***	***6.2***	***3.8***	-
Cam River/Ruataniwha	***1.5***	***1.2***	***1.0***	-
Waimakariri River at SH1	***0.2***	***N/A***	***0.2***	***0.1***

Table 3.4 Northern Waimakariri Tributaries – Nitrate-N Limits

Monitoring

Rec 3.19

That Environment Canterbury makes sufficient resources available to enable significant improvements to continue to be made in the understanding of the Waimakariri Water Zone groundwater system and its connection with the Christchurch aquifer and spring-fed streams. The outcome of this work should be an updated assessment of the direction of travel and likely future nitrate concentrations provided to the committee, partners and stakeholders in 2025.

The key areas for improvement of understanding include;

a. Lag times between land use change and nitrate concentration changes in wells and spring-fed streams
b. Past and present rates of nitrate discharge to ground within the zone and trends in nitrate concentrations
c. Transport pathways between land and key receptors such as spring-fed streams, community water supply wells and the Christchurch aquifer system, so that recharge zones can be defined with more certainty
d. Nitrate attenuation in groundwater
e. The effectiveness of actions (regulatory and non-regulatory) being taken.
f. Nitrate discharges to Ashley Estuary (Te Aka Aka)

Review in 2032

Rec 3.20

That Environment Canterbury commences a review of the Waimakariri section of the Land and Water Regional Plan in 2030 to incorporate new information and understanding of how social, cultural, economic and environmental systems have responded and whether we are on track to meet the plan nitrate limits.

Rec 3.21

That farming land use consents are granted for a duration of 10 years and have common expiry dates to align with plan review stages.

Adapt

Rec 3.22

That Environment Canterbury works with the Waimakariri community and Ngāi Tūāhuriri Rūnanga, to respond accordingly to new information, emerging opportunities and technology, and review the Waimakariri section of the Land and Water Regional Plan at least once every 10years.

Innovation

Rec 3.23

That Environment Canterbury continues to work with sector and research groups to encourage the further development

of tools and techniques to reduce nitrate leaching.

Rec 3.24

The zone committee is supportive of investigation and implementation of on the ground actions to address nitrate issues. These actions could include Managed Aquifer Recharge, targeted stream augmentation, woodchip bioreactors, and others. A zone-wide options study to assess the feasibility, costs and measures required to implement appropriate actions should be completed by the end of 2019, and this will inform the development of sub-catchment management plans. Rules in the Land and Water Regional Plan should be assessed to ensure they are suitably enabling of these activities in the Waimakariri area.

Rec 3.25

The zone committee wish to explore a funding stream and management structure to deliver the significant improvements in stream health and mahinga kai diversity and abundance for the Waimakariri Water Zone over the next 5-10 years. The option of Targeted Rating Districts should be explored by Environment Canterbury. Industry and government funding partners should also be sought.

Rec 3.26

That Environment Canterbury works with others to increase the scale of managed aquifer recharge trials that have proven to be effective.

Rec 3.27

That Environment Canterbury works with sector groups to include new-proven practices within Good Management Practice guidance and Farm Environment Plans.

D4. ECOMMENDATIONS – MANAGING SURFACE WATER QUANTITY

D4.1 Key Issues

The surface water resource of the Waimakariri Water Zone is a diverse mixture of small spring-fed streams near the coast, and larger hill-fed rivers which drain the front ranges adjacent to the Ashley-Waimakariri Plains. This diversity of resource gives rise to a wide range of issues to be managed.

In addition, there are two regional plans which address the management of different parts of the zone. Currently the requirements of these plans do not align, and this adds a layer of complexity to the current issues. Notwithstanding these complexities, there are four key issues which need to be considered.

Environmental Flow Regime requirements in a diverse Zone

In setting environmental flow regimes for the Waimakariri Water Zone, the committee's recommendations for minimum flows and allocation limits must balance the available technical information on effects with the needs of water users. In recommending new minimum flows and allocation limits, the committee has taken into consideration flows for – cultural, indigenous and introduced ecology, recreation, reliability for abstractors, other (e.g. amenity dilution, non-consumptive takes). The way in which these contributing factors is accounted for differs depending on whether the water way is spring-fed, or hill-fed.

Spring-fed streams

The water resource in catchments which rely on spring-fed streams is a product of groundwater levels in the surrounding area. Flow in these spring-fed streams tends to decline as groundwater levels decline during summer, hence water users tend to experience declining reliability as the summer progresses. Relatively large rainfall events are required to increase flows for a sustained period.

Naturally such streams have high base flows, but limited flow variability. Minimum flows are important to ensure that sufficient water remains in the waterway during the summer months, to provide a refuge for fish, and to moderate the increase in water temperature caused by shallow flow in summer months.

Hill-fed streams

The water resource in catchments which rely on hill-fed streams is a product of rainfall and runoff from the surrounding hills. The hill catchments for rivers such as Ashley River/Rakahuri and Cust River sit east of the Southern Alps/Kā Tiritiri o te Moana. They therefore receive less rainfall than rivers such as the Waimakariri River, both in terms of total amount and frequency of storms. As such these rivers tend to be flashy, with flows increasing quickly after rainfall and decreasing quickly once the rainfall has stopped. A lack of storage in lakes and wetlands adds to the flashy nature of the catchment.

These rivers can be challenging for water users to establish reliable water supplies and storage can often be required, particularly for consents which allow high flow water to be taken.

Stream depleting groundwater abstractions

Groundwater abstraction can influence flows in nearby streams, an effect referred to as stream depletion. The magnitude of this effect is dependent on the rate of pumping from the groundwater, the distance from the waterbody and characteristics of the aquifer being pumped. If groundwater is closely linked to surface water, the effect can be mitigated at times of low flow by ceasing abstraction. This means that low flows in streams can receive some protection by turning off stream depleting groundwater abstractions.

To quantify the stream depletion effect the Land and Water Regional Plan sets a methodology which calculates the

depletion effect if the take was pumped at its average rate for 150 days (and maximum rate for 7 days). This calculation quantifies the cumulative effect of a season's worth of abstraction and is applied throughout most of Canterbury.

The Waimakariri River Regional Plan has an older methodology to calculate stream depletion effect calculated over 30 days of pumping. Both methodologies indicate how connected a groundwater take is to river or stream and are used to define whether a groundwater take requires a minimum flow and should be treated in the same way as surface water abstractions.

The 150-day stream depletion test is a more accurate estimate of the stream depletion effect and consequently provides a higher level of protection to rivers and streams. It also means that more groundwater abstractions in the part of the zone currently managed by the WRRP, are counted as being stream depleting. These newly identified stream depleting groundwater abstractions will have a reduction in reliability of supply as they will have minimum flows imposed on them at times of low flow. Previously these abstractions would have been unrestricted even when nearby streams were experiencing low flows.

The zone committee supports the Land and Water Regional Plan rules on stream depletion applying to the whole Waimakariri Water Zone. Particularly as an outcome of the plan change process is that the Waimakariri River Regional Plan no longer applies within the zone.

Over allocation

Six Surface Water Allocation Zones are overallocated, which means that consents have been issued which equate to more than the allocation limit set for the catchment (Table 4.1).

North Waimakariri catchment – Stream/River	Allocation limit	Total water allocated	Over-allocation	
Ashley River/Rakahuri (A block)	700 L/s	1,095 L/s	395 L/s	***56 %***
Saltwater Creek*	408 L/s	505 L/s	97 L/s	***24 %***
Waikuku Stream*	460 L/s	983 L/s	523 L/s	***114 %***
Taranaki Creek*	61 L/s	275 L/s	***214 L/s***	***351 %***
Cust River	***290 L/s***	***366 L/s***	***76 L/s***	***26 %***
Cust Main Drain	***690 L/s***	***804 L/s***	***114 L/s***	***17 %***

* - The allocation limit for these waterways has been incorrectly calculated. See D4.2 for further details

Table 4.1 – Overallocation against current plan limits

The issue of over-allocation has occurred for several reasons which include ongoing development of limits which are applied to existing water rights and the improving understanding of how stream-depleting groundwater takes are connected to surface waterways.

Over-allocation increases the potential effects of water abstraction and to prevent these effects it should be recovered. This is backed-up by the National Policy Statement for Freshwater Management, which requires overallocation be addressed.

Spring-fed waterways and their dependence on groundwater

4,600 L/s of the current allocation block system (82 % of the total block system) comes from spring-fed waterways. These are generally located east of Mandeville and flow to the Ashley River/Rakahuri or Kaiapoi River. The flow rate in these spring-fed streams is dependent on the groundwater level in the aquifers feeding the streams. In turn, the groundwater levels are dependent on inflows from alpine/hill-fed rivers, land-surface recharge induced by rainfall and land surface recharge induced by irrigation and the conveyance of irrigation water through leaky races.

Due to these connections, the flow in spring-fed streams is sensitive to changes in the three main inputs.

Groundwater modelling has tested the effects of reduced rainfall on the plains resulting from reduced irrigation losses because of efficiency gains made by implementing Plan Change 5. Spring-fed waterways close to the Ashley or Waimakariri Rivers are relatively insensitive to these changes, as much of their flow comes from losses out of these major rivers. The spring-fed rivers further away from the main rivers are more sensitive to these changes, with modelled reduction in flow up to 16 %. The Cust River and Cust Main Drain are particularly sensitive to this issue.

Given the likelihood that these changes will occur in the future it is prudent that users reliant on spring-fed waterways consider how their operations would continue under reduced water availability. Similarly, the zone committee needs to consider what management recommendations are required to protect the wider values associated with the spring-fed watercourses in a future with lower spring-flows.

D4.2 Rationale

Setting the Environmental Flow Regime

The environment flow regime used to manage water use in the Waimakariri Water Zone at present is relatively simple. It has three main components which are applied to each of the 16 Surface Water Allocation Zones (SWAZ), these components being:

1. A minimum flow – This is the river flow (in litres per second) below which all abstractions must cease
2. An allocation limit – The total amount of water (in litres per second) that is available to be taken from a river, and
3. Partial restrictions – These reduce water takes as the river approaches its minimum flow, to prevent the minimum flow from being breached because of abstraction

The zone committee has determined that this type of regime be continued, but each of the component parts be reconsidered to make sure they contribute towards the committee's community outcomes.

There are currently areas of the zone which are not covered by SWAZ, and therefore not covered by a published environmental flow regime. At present any application to take water in these areas is dealt with on a case by case basis with the applicant required to demonstrate how the take will avoid effects on the environment.

The zone committee has determined that these gaps need to be infilled, either by extending existing SWAZ, or by creating new SWAZ.

Minimum flows

The zone committee have examined each of the existing minimum flows in terms of how they contribute towards meeting the values held for each SWAZ. Where this was found to be deficient, options for a new minimum flow were considered. To assist the zone committee in choosing a new minimum flow, studies were provided which detail the ecological and cultural minimum flows. These documents define, in isolation from all other factors, the most appropriate minimum flow for ecological, or cultural purposes. The zone committee also considered other information sources, such as economic assessments and water-user feedback, before making its minimum flow recommendations.

Allocation limits

As with minimum flows, the zone committee has examined each of the existing allocation limits in terms of how they contribute towards meeting the values held for each SWAZ. There are less robust metrics by which to judge appropriate allocation levels than there are for minimum flows. Notwithstanding this, the zone committee has reviewed available ecological estimates and weighed these against the current amount of water allocated, the potential for future demand, and the economic effects of removing water from the allocation system.

The zone committee were also asked, via the cultural assessment (COMAR), to consider opportunities to provide an allocation for mahinga kai purposes in catchments where water was unallocated within the existing limits. The zone committee have recommended such an allocation be provided for the Cam River/Ruataniwha, and from the Ashley River/Rakahuri B and C blocks.

Partial restrictions

Partial restrictions require the gradual or stepped reduction of water use, as the river approaches its minimum flow. This prevents the river from being drawn below its minimum flow by consent holders taking their full entitlement. Such restrictions are common place in modern environmental management regimes, but were often missing in older consents, some of which are still active today. The zone committee want to ensure that these are implemented across the Waimakariri Water Zone.

Preventing and Phasing Out Over-allocation

As part of developing this Solutions Programme several catchments with overallocation issues have been identified. These are Ashley River/Rakahuri (A block), Saltwater Creek, Waikuku Stream, Taranaki Creek, Cust River and Cust Main Drain.

The NPSFM requires regional councils to avoid future over-allocation and phase out existing over-allocation within a defined timeframe. The zone committees' first step towards addressing over-allocation is to cap allocation limits and prevent further allocation from occurring. The committee wants to prioritise approaches that reduce paper over-allocation, that is, water that is allocated but not actually used.

Earlier in 2018, the zone committee discussed several approaches to addressing over-allocation with consent holders to get their feedback. This has informed the zone committee's recommendations on phasing out overallocation which are set out below.

- **Prohibit water takes which exceed the plan allocation limit**

This approach is consistent with the position in the Land and Water Regional Plan which in most circumstances prohibit new applications to take water above an allocation limit (exceptions include takes for community water supplies).

- **Switches from surface water and shallow groundwater to deep groundwater**

This would allow river takes and stream depleting groundwater takes in over-allocated catchments to substitute surface water and stream depleting groundwater takes for deep groundwater. This would help address over allocation by reducing abstraction pressure on rivers. It is difficult to predict how much over-allocation will be reduced by because feasibility depends on the availability of deep groundwater in the area. Additional costs associated with pumping may also limit uptake.

A condition of access would be the surrender of the river take or stream depleting groundwater take and there being no increase in the consented rate of take or annual volume. A portion of the remaining groundwater allocation would be ring-fenced for this purpose only. A timeframe by which this option "closes" could be added to spur action sooner rather than later.

- **Percentage reduction in allocation on replacement of consents**

The Land and Water Regional Plan provides a region-wide default position if methods to reduce over-allocation are not specified in the sub-region section of the Land and Water Regional Plan. Replacement consents receive no more than 90% of the previously consented rate of take and annual or seasonal volume, but the reduction can be moderated depending on the efficiency of existing water use. This approach could continue to apply or a modified version of it.

- **Prohibiting or restricting site to site water permit transfers**

The Land and Water Regional Plan already contains policy for the Ashley River/Rakahuri catchment that there shall be no transfers of river water takes in the catchment above SH1. This option could extend this to transfers of river water takes anywhere in the catchment and prohibit all transfers entirely or require that a proportion of any transferred water is surrendered back to the environment. An economic downside of prohibiting transfers entirely is that it does not support the most efficient use of water.

Additionally, prohibiting the transfer of any unexercised water permit, or of any unused water based on actual use records for the last five years would reduce the risk of further abstraction from over-allocated rivers.

- **Voluntary surrender of water permits**

This approach would ask consent holders if there are any active consents that are not being exercised they are willing to surrender prior to their expiry. Any surrendered water would not be reallocated.

- **Not re-allocating lapsed, surrendered or expired consents**

Reducing over-allocation would be assisted by not reallocating water attached to consents that lapse (are not given effect to within 3 years), are surrendered or expire and are not renewed.

- **Allocation of water for irrigation considers records of actual water use**

Several studies generally agree that on average 40-60% of consented allocation gets used on a volumetric basis. However, water use is not straightforward. It is influenced by several factors including the total consented allocation, climate, on-farm practices, farm systems and availability of water. In periods of restriction, water use will be reduced even at times when demand is high.

When new consents for irrigation are assessed or existing consents replaced, Schedule 10 to the Land and Water

Regional Plan (Reasonable Use Test) requires that annual volumes are based on efficient irrigation (application efficiency 80%) and volumes sufficient to meet demand conditions in nine out of 10 years.

Schedule 10 provides three methods for determining the seasonal irrigation demand: records of past use or; a field validated model that predicts the annual irrigation volume within an accuracy of 15% or; a methodology set out in the schedule itself.

Given studies indicate that on average only 40-60% of water is used, allocating water based on records of actual use appears attractive. This may be a long-term option. However, at present we have a relatively short record of actual use and there have been issues with the quality of metered data received so far.

As a first step, the zone committee recommends that actual water use data is taken into account considered when determining an allocation for replacement consents. It also recommends that Environment Canterbury investigates and reports on how metered use compares to consented allocation within the zone.

- **Water User Groups (share water when availability restricted)**

The zone committee supports the establishment of surface water user groups in over-allocated catchments. These groups can be effective at enabling permit holders to share water allocations when takes are operating under partial restrictions (required by the Land and Water Regional Plan) and users are unable to take their full consented allocation.

- **Offset mitigations in short term**

It may take some years to reduce over-allocation. Offset mitigations such as riparian plantings for shade and reducing water temperature could be fast forwarded within highly allocated catchments as part of the zone committee's programme of developing Catchment Management Plans.

- **River flow augmentation**

The zone committee supports the introduction of augmentation water that could offset the effects of over allocation and assist with addressing elevated nitrate concentrations in some rivers. For example, the Waimakariri River Regional Plan includes provisions that enable the augmentation of the Cust River with water from the Waimakariri River to protect and enhance stream values. Environment Canterbury is investigating whether the water allocated for this purpose remains available for use. The Land and Water Regional Plan does not contain specific provisions that enable augmentation.

- **Consent Review**

There is an expectation that regional plans will be implemented, and reviews of resource consent conditions are, in some situations, an appropriate tool to do this. This could include reviewing water permits to align with new flow and allocation regimes and to address over-allocation. There are financial and legal implications that need to be considered before carrying out any consent review. The alternative is to implement new conditions upon application for replacement water permits.

Rationale specific to the Ashley River/Rakahuri and tributaries

Because of the diversity of surface water quantity issues the zone committee was required to assess issues on a SWAZ by SWAZ basis and develop environmental flow regimes which contribute towards addressing these issues.

Rationale for allocation limit methodology correction

This process creates an opportunity to correct an historical error associated with the allocation limits stated in the Land and Water Regional Plan for Saltwater Creek, Waikuku Stream, Little Ashley Creek and Taranaki Creek.

During the writing of the Land and Water Regional Plan, and its predecessor the Natural Resources Regional Plan, surface water allocations were generally set by summing all the water allocated. The total reached was used as the allocation limit.

At the time there were two methods being discussed to calculate the total water allocated.

The first method was to sum the average rate of take for each consent. This was because in general consent holders rarely use all their consented maximum rate and therefore the actual water being used at any one time could be more accurately assessed as the average rate of take, rather than the maximum as stated on the consent document. Average rate was calculated by dividing the consented volume by the period in which the consent allows the volume to be used. For instance, a consent may state a volume of 10,000 m3 can be used every 14 days. In this example the average rate would be 8 L/s.

The second method was more straightforward in that is summed the maximum rates as stated on the consent documents. This acknowledged that although it was typical that consent holders would not use all their maximum rate, because they have consent to do so, there is nothing that could be done to stop them and therefore the sum of the maximum rates of take was the actual water allowed to be taken.

Across Canterbury the second method, summing the maximum rate of take for each consent, was adopted to determine allocation limits. This was not the case for the spring-fed tributaries of the Ashley River/Rakahuri; the allocation limits for these rivers were developed based on the average take methodology.

This process provides an opportunity to bring these waterways into line with the rest of the region by adopting allocation limits based on the sum of the maximum rate of takes. To provide limits which are equitable with limits set elsewhere, it is proposed that the sum of the maximum rate of takes at 1st January 2002 be used to set the limits. This is the date used to set the current Land and Water Regional Plan limits which have been determined to be incorrect. Table 4.2 shows the allocation limits for each SWAZ, based on the average and maximum rate of take at 1st January 2002.

	Allocation limit	
	Average rate methodology	Maximum rate methodology
Saltwater Creek	408 L/s	417 L/s
Waikuku Stream	460 L/s	831 L/s
Little Ashley Creek	172 L/s	344 L/s
Taranaki Creek	***61 L/s***	***149 L/s***

Table 4.2 – Allocation limits by method

Table 4.2 shows that the revised allocation limits are higher than the current Land and Water Regional Plan limits. Except for Little Ashley Creek, these waterways are over-allocated against both the current and revised allocation limits. The effect of correcting the plan limits is that no further water can be allocated. It does, however, reduce the size of the overallocation which is to be recovered.

Little Ashley Creek is currently under-allocated and as such there is the risk that the revised allocation limit could allow more water to be allocated. To prevent this the zone committee is seeking to adopt a 'cap at current allocated water' approach, rather than adopting the revised limit (see D4.3).

General rationale

The rationale for the zone committee's other recommendations for the Ashley River/ Rakahuri and tributaries is provided in Table 4.3.

Surface Water Allocation Zone (SWAZ)	Proposed Environmental Flow Regime	Rationale
Ashley River/Rakahuri (A Block)	Current minimum flow not changed: Jan – Jul 2,500 L/s Aug – Nov 4,000 L/s Dec 3,000 L/s Current allocation limit of 700 L/s to be kept SWAZ is 395 L/s over-allocated At least 20 % of the currently allocated water is to be recovered	Current minimum flow was set to prevent abstractions from exacerbating the natural occurrence of dry reaches and this remains the key driver. Allocation block is over-allocated, and focus is the recovery of over-allocation. Many old consents have lower minimum flows, and do not have partial restrictions and just moving to the current plan rules will have a large impact on their operations.
Ashley River/Rakahuri (B Block)	Current minimum flow not changed: Jan – Jul 3,200 L/s Aug – Nov 4,700 L/s Dec 3,700 L/s Current allocation limit of 500 L/s to be reduced to the current allocation (135 L/s at Nov 2017) + an allocation for mahinga kai enhancement An allocation for mahinga kai enhancement shall be available equal to 50 % of the available allocation	Any increase to the minimum flow would have significant impacts upon the already poor reliability of takes. The allocation size is being reduced to minimise the risk to flow variability in the future. An allocation for mahinga kai enhancement is proposed. While anyone could seek consent to take this water, it would need to be for mahinga kai enhancement, and consultation would be needed with Ngāi Tūāhuriri Rūnanga.
Ashley River/Rakahuri (C Block)	Current minimum flow of 6,000 L/s not changed Current allocation limit of 3,000 L/s to be reduced to the current allocation (294 L/s at Nov 2017) + an allocation for mahinga kai enhancement An allocation for mahinga kai enhancement shall be available equal to 50 % of the available allocation	Any increase to the minimum flow would have significant impacts upon the already poor reliability of takes. The reduction in the B block allocation limit provides a gap between the B and C blocks. It is being reduced to minimise the risk to flow variability in the future. An allocation for mahinga kai enhancement is proposed. While anyone could seek consent to take this water, it would need to be for mahinga kai enhancement, and consultation would be needed with Ngāi Tūāhuriri Rūnanga.

Table 4.3 – Rationale for the Ashley River/Rakahuri and tributaries

Surface Water Allocation Zone (SWAZ)	Proposed Environmental Flow Regime	Rationale
Saltwater Creek	Current minimum flow of 100 L/s to be maintained and increased to 148 L/s in 2032 Current allocation limit of 408 L/s to be maintained but adjusted to reflect the correct methodology. It is now 417 L/s SWAZ is 88 L/s over-allocated At least 20 % of the currently allocated water is to be recovered Partial restrictions are required for all surface water takes No B block is currently available, and this is to be maintained	There is a lack of partial restrictions on consents in this catchment. The requirement to adopt these will have a large impact and it was felt that the cumulative effect of this and a higher minimum flow would impact users too much. A higher minimum flow is proposed for 2032 to give users time to prepare. The partial restrictions will keep more water in the river and prevent it from being drawn below the minimum flow. Allocation limit was not reduced given the significant work required to recover over-allocation. If any gains can be made in removing allocation from the system then this will not be reallocated, maximising the benefits to the stream, and to the Ashley Estuary (Te Aka Aka) B blocks which allow the taking of high flow water are not suitable for spring-fed streams and are not supported here
Waikuku Stream	Current minimum flow of 100 L/s (Mon-Fri) and 150 L/s (Sat-Sun) to be increased to 150 L/s at all times. Current allocation limit of 460 L/s to be maintained but adjusted to reflect the correct methodology. It is now 831 L/s SWAZ is 152 L/s over-allocated At least 20 % of the currently allocated water is to be recovered No B block is currently available, and this is to be maintained	Waikuku Stream is an important contributor to Ashley Estuary (Te Aka Aka) and a fish refuge in times of low flow in the Ashley River/Rakahuri. The minimum flow has been increased to reflect this. The ZIPA will contain a higher minimum flow (250 L/s), that being future goal of the committee. Allocation limit was not reduced given significant work to recover over-allocation. If any gains can be made in removing allocation from the system then this will not be reallocated, maximising the benefits to the stream, and to the Ashley Estuary (Te Aka Aka). B blocks which allow the taking of high flow water are not suitable for spring-fed streams and are not supported here.

Table 4.3 – Rationale for the Ashley River/Rakahuri and tributaries

Surface Water Allocation Zone (SWAZ)	Proposed Environmental Flow Regime	Rationale
Little Ashley Creek	Current minimum flow of 50 L/s and 30 L/s (4 days per month) to be increased to 50 L/s at all times. Current allocation limit of 172 L/s to be reduced to the current allocation (42 L/s at Nov 2017) No B block is currently available, and this is to be maintained	The variable minimum flow allowed flood irrigation to occur. This outdated irrigation technique is no longer practiced in the catchment and so the rule is not required. Significant water remains available in the allocation block, yet no areas of land are available to irrigate. The creek is a contributor of flow to Waikuku Stream and Ashley Estuary (Te Aka Aka) and hence the Committee have capped the allocation to avoid adverse effects from future use. B blocks which allow the taking of high flow water are not suitable for spring-fed streams and are not supported here
Taranaki Creek	Current minimum flow of 120 L/s is to be kept Current allocation limit of 61 L/s to be maintained but adjusted to reflect the correct methodology. It is now 149 L/s At least 20 % of the currently allocated water is to be recovered SWAZ is 126 L/s over-allocated Partial restrictions are required for all surface water takes. No B block is currently available, and this is to be maintained	Ecological and cultural recommendations were for the minimum flow to stay at 120 L/s. Allocation limit was not reduced given significant work to recover over-allocation. If any gains can be made in removing allocation from the system then this will not be reallocated, maximising the benefits to the stream, and to the Ashley Estuary (Te Aka Aka). B blocks which allow the taking of high flow water are not suitable for spring-fed streams and are not supported here.

Table 4.3 – Rationale for the Ashley River/Rakahuri and tributaries

Rationale specific to the Northern Waimakariri Tributaries

The zone committee assessed issues on a Surface Water Allocation Zone basis and developed environmental flow regimes which contribute towards addressing these issues. Provided below (Table 4.4) is a brief summary of the zone committee's rationale for each SWAZ.

Surface Water Allocation Zone (SWAZ)	Proposed Environmental Flow Regime	Rationale
Cam River/Ruataniwha	Current minimum flow of 1,000 L/s to be kept, with a future goal of 1,200 L/s Current allocation limit of 700 L/s to be reduced to the current allocation (278 L/s at Nov 2017) + an allocation for mahinga kai enhancement An allocation for mahinga kai enhancement shall be available equal to 50 % of the available allocation The current B block is to be removed meaning no B block water will be available	The minimum flow was originally set to dilute sewage from Rangiora. It is higher than a 'typical' ecological flow recommendation. That said there are significant issues with the river which would be made worse by lowering the minimum flow. The Committee have recommended to keep it as its current level but would like to see it increased in the long term. The allocation block is to be reduced to current allocation levels, to prevent further degradation of the river, without impacting current water users. An allocation for mahinga kai enhancement is proposed. While anyone could seek consent to take this water, it would need to be for mahinga kai enhancement, and consultation would be needed with Ngāi Tūāhuriri Rūnanga. B blocks which allow the taking of high flow water are not suitable for spring-fed streams and are not supported here.
North Brook	Current minimum flow of 530 L/s to be increased to 560 L/s, with a future goal of 590 L/s Current allocation limit of 200 L/s to be reduced to the current allocation (190 L/s at Nov 2017) The current B block is to be removed meaning no B block water will be available	Minimum flow increased to the ecological recommendation to improve the habitats available in the river during low flows The allocation size is being reduced to minimise the risk to flow variability in the future. B blocks which allow the taking of high flow water are not suitable for spring-fed streams and are not supported here.

Table 4.4 – Rationale for the Northern Waimakariri Tributaries

Surface Water Allocation Zone (SWAZ)	Proposed Environmental Flow Regime	Rationale
Middle Brook	Current minimum flow of 60 L/s to kept Current allocation limit of 30 L/s to be kept The current B block is to be removed meaning no B block water will be available	The flow regime is not being changed for this SWAZ and changes would have a large impact on the viability of take. B blocks which allow the taking of high flow water are not suitable for spring-fed streams and are not supported here.
South Brook	Current minimum flow of 140 L/s is to be increased to 155 L/s, with a future goal of 170 L/s Current allocation limit of 100 L/s to be reduced to the current allocation (24 L/s at Nov 2017) The current B block is to be removed meaning no B block water will be available	Minimum flow increased to a high level of habitat protection to improve the habitats available in the river during low flows The allocation size is being reduced to minimise the risk to flow variability in the future. B blocks which allow the taking of high flow water are not suitable for spring-fed streams and are not supported here.
Cust River	Current A block minimum flow is pending Current allocation limit of 290 L/s to be kept SWAZ is 76 L/s over-allocated At least 20 % of the currently allocated water is to be recovered Current B block minimum flow of 310 L/s is to be kept B Block allocation limit reduced from 'unlimited' to 131 L/s	Work to define the A block minimum flow is still underway. The A block allocation is over-allocated and so efforts are to be focused on reducing the over-allocation. If these efforts result in reductions of allocation below the limit, then no new consents will be issued. This keeps the returned water in the river The Cust River is hill-fed and hence a B Block can be supported. The zone committee propose that the current arrangements be kept, and the allocation be capped at the current level.
Cust Main Drain	Current minimum flow of 230 L/s is to be kept Current allocation limit of 690 L/s to kept SWAZ is 114 L/s over-allocated At least 20 % of the currently allocated water is to be recovered The current B block is to be removed meaning no B block water will be available	Minimum flow and allocation are to be kept the same as the current regime. Takes from the river are well managed, but the river is over-allocated. The A block allocation is over-allocated and so efforts are to be focused on reducing the over-allocation. If these efforts result in reductions of allocation below the limit, then no new consents will be issued. This keeps the returned water in the river B blocks which allow the taking of high flow water are not suitable for spring-fed streams and are not supported here.

Table 4.4 – Rationale for the Northern Waimakariri Tributaries

Surface Water Allocation Zone (SWAZ)	Proposed Environmental Flow Regime	Rationale
No.7 Drain	Current minimum flow of 60 L/s is to be kept Current allocation limit of 130 L/s to be reduced to the current allocation (85 L/s at Nov 2017) The current B block is to be removed meaning no B block water will be available	Minimum flow is to be kept the same as the current regime. The allocation size is being reduced to minimise the risk to flow variability in the future. B blocks which allow the taking of high flow water are not suitable for spring-fed streams and are not supported here.
Ohoka Stream	Current minimum flow of 300 L/s is to be increased to 420 L/s Current allocation limit of 500 L/s to be reduced to the current allocation (467 L/s at Nov 2017) The current B block is to be removed meaning no B block water will be available	Minimum flow is to be increased to a level which better protects the ecology of the stream. The allocation size is being reduced to minimise the risk to flow variability in the future. B blocks which allow the taking of high flow water are not suitable for spring-fed streams and are not supported here.
Silverstream	Current minimum flow of 600 L/s is to be increased to 900 L/s, with a future goal of 1,200 L/s Current allocation limit of 1,000 L/s to be reduced to the current allocation (432 L/s at Nov 2017) The current B block is to be removed meaning no B block water will be available	Minimum flow is to be increased to a level which better protects the ecology of the stream. The zone committee considers 1,200 L/s to be a future goal, which would further increase the protection for instream ecology and increasing contribution to the Kaiapoi River during low flows. The allocation size is being reduced to minimise the risk to flow variability in the future. B blocks which allow the taking of high flow water are not suitable for spring-fed streams and are not supported here.

Table 4.4 – Rationale for the Northern Waimakariri Tributaries

Surface Water Allocation Zone (SWAZ)	Proposed Environmental Flow Regime	Rationale
Courtenay Stream	Current minimum flow of 260 L/s is to be increased to 330 L/s Current allocation limit of 140 L/s to be reduced to the current allocation (128 L/s at Nov 2017) The current B block is to be removed meaning no B block water will be available	Minimum flow is to be increased to a level which better protects the ecology of the stream. The zone committee would like to see the minimum flow increased to 400 L/s in the future further increasing the protection for instream ecology and increasing contribution to the Kaiapoi River during low flows. The allocation size is being reduced to minimise the risk to flow variability in the future. B blocks which allow the taking of high flow water are not suitable for spring-fed streams and are not supported here.
Greigs Drain	Current minimum flow of 150 L/s is to be increased to 230 L/s Current allocation limit of 70 L/s to be reduced to the current allocation (46 L/s at Nov 2017) The current B block is to be removed meaning no B block water will be available	Minimum flow is to be increased to a level which better protects the ecology of the stream. The allocation size is being reduced to minimise the risk to flow variability in the future. B blocks which allow the taking of high flow water are not suitable for spring-fed streams and are not supported here
McIntosh/Kairaki	No surface water allocation block	To protect the important wetland/ lagoon complex here the zone committee propose no surface water be available for allocation. Groundwater takes are permitted, so long as they have a low, or no, stream depleting effect.
Eyre River	No surface water allocation block	This area has no permanently flowing waterways and therefore the assigning of a surface water block is problematic. Therefore, it is proposed that there be no surface water block available in this SWAZ. All takes would be assigned to the groundwater allocation block.
Upper Eyre River	Minimum flow – 54 L/s Allocation limit of 66.5 L/s	Minimum flow is to be kept the same as the current regime. The allocation size is being reduced to minimise the risk to flow variability in the future and will be capped at the current level of allocation.

Table 4.4 – Rationale for the Northern Waimakariri Tributaries

Aligned with Community Outcomes

- The water quality and quantity of spring-fed streams maintains or improves mahinga kai gathering and diverse aquatic life.
- The Ashley River/Rakahuri is safe for contact recreation, has improved river habitat, fish passage, and customary use; and has flows that support natural coastal processes.
- The Waimakariri River as a receiving environment is a healthy habitat for freshwater and coastal species and is protected and managed as an outstanding natural landscape and recreation resource.
- The zone has safe reliable drinking water, preferably from secure sources.
- Indigenous biodiversity in the zone is protected and improved.
- Highly reliable irrigation water, to a target of 95%, is available in the zone.
- Optimal water and nutrient management is common practice.
- There is improved contribution to the regional economy from the zone.
- Land and freshwater management in the Waimakariri Water Zone will, over time support the maintenance of the current high-quality drinking water from Christchurch aquifers.

D4.3 Draft Recommendations – Managing Surface Water Quantity

Recommendations across all of the Waimakariri Water Zone

Rec 4.1

In over-allocated Surface Water Allocation Zones, that Environment Canterbury recover at least 20 % of the total allocated water, by 2032.

Rec 4.2

That Environment Canterbury use the following suite of options to recover over-allocation, prioritising those options which reduce paper allocation.

a. Prohibit any abstraction, other than for community drinking water supplies, where a limit has, or would be, exceeded.

b. Enable the substitution of existing surface water or stream depleting groundwater takes with deep groundwater in over-allocated catchments provided there is no increase in the rate of take or annual volume.

c. In the case of site to site water transfers

   i. Prohibit the transfer of any unexercised water permit, and/or of any unused water from the previous 5 years, based on actual usage records.

   ii. For transfers of water within over-allocated catchments 50% of the transferred water (rate of take and/or annual volume) is to be surrendered unless the water is to be used for a community water supply.

   iii. Retain Land and Water Regional Plan Section 8 policy that there are no transfers of river water takes within the Ashley River/Rakahuri catchment above State Highway 1

d. That Environment Canterbury identifies water permits that have not been exercised in the past five years and works with consent holders to seek their surrender.

e. Lapsed consents

   i. For any water permit that lapses, is surrendered, or expires and is not renewed, the rate of take and/or annual volume is not reallocated

   ii. Lapse dates on unexercised consents are prevented from being extended except where exceptional extenuating circumstances are demonstrated.

f. Past water use

   i. The Plan Change includes policy direction that records of past water use are assessed and considered when determining an efficient allocation for replacement consents in accordance with Schedule 10

   ii. That Environment Canterbury investigates and reports annually on how metered usage compares to consented allocation within the Waimakariri Water Zone.

g. Region-wide policy in the Land and Water Regional Plan for reducing over allocation by adjusting the allocation on replacement consents applies throughout the whole of the Waimakariri Water Zone, not only within the Ashley River/Rakahuri catchment.

Rec 4.3

That Environment Canterbury applies LWRP requirements for partial restrictions and requires that pro-rata restrictions be applied to all surface water takes, and stream-depleting groundwater takes which require a minimum flow in the zone

Rec 4.4

That Environment Canterbury adopt the methodology for classifying stream-depleting groundwater takes laid out in Schedule 9 of the Land and Water Regional Plan

Rec 4.5

That Environment Canterbury remove B allocation blocks from all spring-fed rivers

Rec 4.6

That Environment Canterbury extend existing SWAZ and/or introduce new SWAZ to ensure that there are no gaps in the environmental flow regime framework which manages the Waimakariri Water Zone.

Rec 4.7

In currently under-allocated catchments, that Environment Canterbury cap the allocation at the currently allocated amount, so no further surface water can be allocated.

Rec 4.8

That Environment Canterbury support water users to set up water user groups such that the available water resource can be best managed, particularly in times of restriction

Rec 4.9

Environment Canterbury investigate how takes for community supplies (and, back-up supplies) are incorporated into the allocation block system, such that they do not unnecessarily impact on the reliability of takes by other users.

Rec 4.10

The zone committee will prioritise over-allocated catchments in its catchment management plan programme and actively promote the use of non-statutory mitigations to offset the effects of over-allocation.

Augmentation

Rec 4.11

That the Plan Change to section 8 of the Land and Water Regional Plan (Waimakariri) includes policies and rules that adequately provide for augmentation of water bodies, including the Cust River, for environmental benefit

a) Ngāi Tūāhuriri Rūnanga are actively involved in any decision-making regarding water used in the zone for augmentation purposes.

Water Race Losses

Rec 4.12

That any changes to the water race network (e.g. race closure or piping) in the Waimakariri Water Zone be subject to wider consideration by Environment Canterbury and Waimakariri District Council, given the existing benefits of race losses in diluting nitrate concentrations, and supporting groundwater levels and stream flows.

Review of water permits

Rec 4.13

The zone committee recommends that Environment Canterbury allocates resources to improve monitoring of permitted surface water irrigation takes for compliance with limits in the Land and Water Regional Plan.

Rec 4.14

That in any year it chooses within the date range below, that the Environment Canterbury considers, prioritises and may undertake a review of water permits to align with any revised environmental flow and allocation regime following the Waimakariri plan change becoming operative:

a) Ashley River/Rakahuri Catchment – between 2025 and 2030

b) Northern Waimakariri Tributaries – between 2030 and 2035

Recommendations specific to the Ashley/Rakahuri Catchment

In addition to the zone-wide recommendations provided, the following recommendations are made which apply to SWAZ within the Ashley/Rakahuri Catchment.

Rec 4.15

For the Ashley River/Rakahuri B and C blocks, that Environment Canterbury designate an allocation for mahinga kai enhancement purposes equal to 50 % of the water available within the existing block system. This allocation would be included in, and subject to, the prevailing management rules for that block (minimum flow and restriction regime).

Rec 4.16

That Environment Canterbury adopt the minimum flow and allocation recommendations in Table 4.5

Table 4.5: Ashley River/Rakahuri and Tributaries – Recommended Minimum Flows and Allocations

		Minimum flow				Allocation limit				Allocation status (Nov 2017)			
		Current plan	From plan notification	From 2032	Future goal	Current plan	From plan notification	From 2032	Future goal	Current plan	From plan notification	From 2032	Future goal
Saltwater Creek SWAZ	A Block	100 L/s	100 L/s	148 L/s	-	408 L/s*	417 L/s#	-	-	97 L/s over-allocated	88 L/s over-allocated	At least 20% recovery	-
	B Block	-	-	-	-	-	-	-	-	-	-	-	-
Waikuku Stream SWAZ	A Block	100 L/s (Mon-Fri) 150 L/s (Sat-Sun)	150 L/s	-	250 L/s	460 L/s*	831 L/s#	-	-	523 L/s over-allocated	152 L/s over-allocated	At least 20% recovery	-
	B Block	-	-	-	-	-	-	-	-	-	-	-	-
Taranaki Creek SWAZ	A Block	120 L/s	120 L/s	-	-	61 L/s*	149 L/s#	-	-	214 L/s over-allocated	126 L/s over-allocated	At least 20% recovery	-
	B Block	-	-	-	-	-	-	-	-	-	-	-	-
Little Ashley Creek SWAZ	A Block	50 L/s, but 30 L/s 4 days /month	50 L/s	-	-	172 L/s*	Cap at current (42 L/s @ 2018)	-	-	Allocation available	-	-	-
	B Block	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Ashley River / Rakahuri SWAZ	**A block**	**2,500 L/s (Jan-Jul), 4,000 L/s (Aug-Nov), 3,000 L/s (Dec)**	**2,500 L/s (Jan-Jul), 4,000 L/s (Aug-Nov), 3,000 L/s (Dec)**	**-**	**-**	**700 L/s**	**700 L/s**	**-**	**-**	**395 L/s over-allocated**	**-**	**At least 20% ecovery**	**-**
	B Block	**3,200 L/s (Jan-Jul), 4,700 L/s (Aug-Nov), 3,700 L/s (Dec)**	3,200 L/s (Jan-Jul), 4,700 L/s (Aug-Nov), 3,700 L/s (Dec)	-	-	500 L/s	Cap at current + enhancement allocation (135 L/s @ 2018)	-	-	Allocation available	-	-	-
	C Block	6,000 L/s	6,000 L/s	-	-	3,000 L/s	Cap at current + enhancement allocation (294 L/s @ 2018)	-	-	**Allocation available**	-	-	-

Note:

* LWRP allocation (noted as being incorrectly calculated)

Same as LWRP value after correction for methodology

^ Resulting from revised allocation limit methodology

Recommendations specific to the Northern Waimakariri Tributaries

In addition to the zone-wide recommendations provided, the following recommendations are made which apply to SWAZ within the Northern Waimakariri Tributaries.

General recommendations

Rec 4.17

For the Cam River/Ruataniwha A block, that Environment Canterbury designate an allocation for mahinga kai enhancement purposes equal to 50 % of the water available within the existing block system. This allocation would be included in, and subject to, the prevailing management rules for that block (minimum flow and restriction regime).

Rec 4.18

That Environment Canterbury adopt the minimum flow and allocation recommendations in Table 4.6.

Silverstream & Kaiapoi River recommendations

Rec 4.19

In all zone committee proceedings and documentation the local naming convention is to be adopted:

1. The term 'Silverstream' will be used to define the section of watercourse from the springheads to the three streams confluence.
2. The term 'Kaiapoi River' will be used to define the section of watercourse from the three streams confluence to the Waimakariri River confluence.

Rec 4.20

Environment Canterbury investigate the measures that would lead to a significant improvement to the values placed on the 'Kaiapoi River'.

Table 4.6 Northern Waimakariri Tributaries – Recommended Minimum Flow and Allocation Limits

		Minimum flow				Allocation limit				Allocation status (Nov 2017)			
		Current plan	From plan notification	From 2032	Future goal	Current plan	From plan notification	From 2032	Future goal	Current plan	From plan notification	From 2032	Future goal
Cam River/ Ruataniwha SWAZ	A Block	1,000 L/s	1,000 L/s	-	1,200 L/s	700 L/s	Cap at current (278 L/s @ 2018)	-	-	Allocation available	-	-	-
	B Block	1,700 L/s	No B Block			No limit	No B Block			Allocation available	-	-	-
North Brook SWAZ	A Block	530 L/s	560 L/s	-	590 L/s	200 L/s	Cap at current (190 L/s @ 2018)	-	-	Allocation available	-	-	-
	B Block	730 L/s	No B Block			No limit	No B Block			Allocation available	-	-	-
Middle Brook SWAZ	A Block	60 L/s	60 L/s	-	-	30 L/s	30 L/s	-	-	Fully allocated	-	-	-
	B Block	90 L/s	No B Block			No limit	No B Block			Allocation available	-	-	-
South Brook SWAZ	A Block	140 L/s	155 L/s	-	170 L/s	100 L/s	Cap at current (24 L/s @ 2018)	-	-	Allocation available	-	-	-
	B Block	240 L/s	No B Block			No limit	No B Block				-	-	-
Cust River SWAZ	A Block	20 L/s	Pending	Pending	Pending	290 L/s	290 L/s	-	-	76 L/s over-allocated	Al least 20 % recovery	-	-
	B Block	310 L/s	Pending	Pending	Pending	No limit	Cap at current (131 L/s @ 2018)	-	-	Allocation available	-	-	-
Cust Main Drain SWAZ	A Block	230 L/s	230 L/s	-	270 L/s	690 L/s	690 L/s	-	-	114 L/s over-allocated	At least 20 % recovery	-	-
	B Block	920 L/s	No B Block			No limit	No B Block			Allocation available	-	-	-
No.7 Drain SWAZ	A Block	60 L/s	60 L/s	-	-	130 L/s	Cap at current (85 L/s @ 2018)	-	-	Allocation available	-	-	-
	B Block	190 L/s	No B Block			-	No B Block				-	-	-

Note 1: The zone committee's majority preference is to implement a minimum flow of 900 L/s for the Silverstream, as presented above in table 4.6. An alternate view was for a minimum flow of 1,200+ L/s for the Silverstream.

Note 2: Further work is currently underway to derive an appropriate minimum flow for the Cust River

Table 4.6 Northern Waimakariri Tributaries – Recommended Minimum Flow and Allocation Limits

		Minimum flow				Allocation limit				Allocation status (Nov 2017)			
		Current plan	From plan notification	From 2032	Future goal	Current plan	From plan notification	From 2032	Future goal	Current plan	From plan notification	From 2032	Future goal
Ohoka Stream SWAZ	A Block	300 L/s	420 L/s	-	-	500 L/s	Cap at current (467 L/s @ 2018)	-	-	Allocation available	-	-	-
	B Block	800 L/s	No B Block			No limit	No B Block			Allocation available	-	-	-
Silverstream SWAZ	A Block	600 L/s	900 L/s	-	1,200 L/s	1,000 L/s	Cap at current (432 L/s @ 2018)	-	-	Allocation available	-	-	-
	B Block	1,600 L/s	No B Block			No limit	No B Block			Allocation available	-	-	-
Courteny Stream SWAZ	A Block	260 L/s	330 L/s	-	400 L/s	140 L/s	Cap at current (128 L/s @ 2018)	-	-	Allocation available	-	-	-
	B Block	400 L/s	No B Block			No limit	No B Block			Allocation available	-	-	-
Greigs Drain SWAZ	A Block	150 L/s	230 L/s	-	-	70 L/s	Cap at current (46 L/s @ 2018)	-	-	Allocation available	-	-	-
	B Block	No B Block				No limit	No B Block			Allocation available	-	-	-
McIntosh/Kairaki SWAZ	A Block	No A Block				No A Block				No block system	-	-	-
	B Block	No B Block				No B Block				No block system	-	-	-
Eyre River SWAZ	A Block	No A Block				No A Block				No block system	-	-	-
	B Block	No B Block				No B Block				No block system	-	-	-
Upper Eyre River SWAZ	A Block	-	54 L/s	-	-	-	Cap at current (66.5 L/s @ 2018)	-	-	No block system	-	-	-
	B Block	No B Block				No B Block					-	-	-

Applying to all SWAZ:

1. Stream depletion effects estimated using the method laid out in Schedule 9 of the Land and Water Regional Plan
2. Partial restrictions applied to all takes on a pro-rata basis

D5. RECOMMENDATIONS – MANAGING GROUNDWATER QUANTITY

D5.1 Key Issues

The Eyre River Groundwater Allocation Zone (GAZ) is fully allocated. Groundwater allocation limits in the Ashley, Cust, Kowai and Loburn GAZs currently allow for further water to be allocated. Increased abstraction could have economic benefits for new water users but could have detrimental impacts on stream flows and on the reliability of existing groundwater and surface water takes. Reduced reliability would have an adverse economic impact.

The technical assessments indicated that groundwater levels in the Eyre River GAZ and flows in some of the watercourses in and adjacent to the Waimakariri Irrigation Ltd (WIL) command area are higher now than they used to be before the irrigation scheme was developed. This is due to additional aquifer recharge associated with race leakage and irrigation losses. Improvements in irrigation efficiency in river-fed irrigation areas (e.g. the WIL command area) under GMP are expected to reduce recharge to the aquifer system and cause flows to decline in some of the spring-fed streams. Modelling indicates that flow could decline significantly in the Cust River and Cust Main Drain. This would impact cultural and ecological values and the reliability of surface water and groundwater takes and compound the effects of increased groundwater abstraction if this is provided for by leaving the current allocation limits unchanged.

Flows in the Ashley River/Rakahuri have been declining for several decades, most likely due to climatic factors. Groundwater levels and flows in the spring-fed streams are also declining, probably because of reduced groundwater recharge by the Ashley River/Rakahuri. The Lees Valley (where the Ashley River/Rakahuri is sourced) currently has no groundwater allocation limit; this makes the cumulative effects of any future increases in groundwater abstraction on surface water bodies such as the Ashley River/Rakahuri difficult to manage.

Current Groundwater Allocation Zone boundaries terminate at the edge of the plains. This leaves some areas of the zone with no allocation limit and no means by which the cumulative effects of abstraction can be managed.

D5.2 Rationale

Groundwater Allocation Zone (GAZ)	Recommended Allocation Limit	Rationale
Kowai	Current allocated volume + 10% for new takes	Reduces potential for future increases in groundwater abstraction. Reduces the potential for further declines in Saltwater Creek and local groundwater levels due to new abstraction. Supports current reliability of existing water takes.
Ashley	Current allocated volume plus an amount to enable switches from surface water to groundwater in SWAZs where surface water is over-allocated such as Ashley River/Rakahuri A Block, Taranaki Creek, Waikuku Stream, Saltwater Creek and Little Ashley Creek + 10% for new takes (non-stream depleting)	Reduces potential for future increases in groundwater abstraction. Reduces the potential for further declines in spring-fed streams and local groundwater levels due to new abstraction. Supports current reliability of existing water takes.
Loburn	Current allocated volume + 10% for new takes (non-stream depleting)	Reduces potential for increase in groundwater abstraction which could exacerbate low flows in the Ashley River/Rakahuri and may result in increased duration, frequency and length of dry reaches.
Cust	Current allocated volume plus an amount to enable switches from surface water only for SWAZs where surface water is over allocated (e.g. Cust River A Block, Cust Main Drain) + 10% for new takes (non-stream depleting)	Full usage of the current allocated volume could cause flows in Ohoka Stream, Cust River and Cust Main Drain to reduce by more than 10%. Improved irrigation efficiency (GMP) is expected to cause flows in the Cust River and Cust Main Drain to decline by 16% and 12% respectively
Eyre River	99,070,000 million m3/yr (Current allocation limit)	Fully allocated
Proposed Lees Valley	Create GAZ Current allocated volume + 10% for new takes (non-stream depleting)	Move from unmanaged to managed groundwater abstraction. Increased groundwater abstraction from the Lees Valley area could have a significant effect on low flows in the Ashley River/Rakahuri

Table 5-1: Recommended Groundwater Allocation limits

Aligned with Community Outcomes

- The zone has safe reliable drinking water, preferably from secure sources
- Highly reliable irrigation water, to a target of 95%, is available in the zone
- Optimal water and nutrient management is common practice
- There is improved contribution to the regional economy from the zone
- Land and freshwater management in the Waimakariri Water Zone will, over time support the maintenance of the current high-quality drinking water from Christchurch aquifers

D5.3 Draft Recommendations – Managing Groundwater Quantity

Groundwater Allocation Limits

The Waimakariri Water Zone committee recommends Environment Canterbury set the following allocation limits for the Groundwater Allocation Zones:

Rec 5.1

Ashley – Cap at current allocated volume plus 10% for new non-stream depleting takes plus an amount to enable switches from surface water

Rec 5.2

Loburn – Cap at current allocated volume with an additional 10% for new takes

Rec 5.3

Cust – Cap at current allocated volume plus an amount to enable switches from surface water only for SWAZs where surface water is over allocated (e.g. Cust River A Block, Cust Main Drain), with an additional 10% for new takes (non-stream depleting)

Rec 5.4

Eyre – Maintain current allocation limit: no new water to be allocated

Rec 5.5

Lees Valley – Proposed to create a Lees Valley Groundwater Allocation Zone, and cap at current allocated volume with an additional 10% for new non-stream depleting takes.

Rec 5.6

That Environment Canterbury extend the Groundwater Allocation Zone boundaries further inland, to the edge of surface water catchment boundary.

Rec 5.7

That Environment Canterbury allocates resources to improve monitoring of permitted groundwater irrigation takes for compliance with limits in the LWRP.

The proposed GAZ boundaries are shown on Map X4.

APPENDICES

APPENDIX 1– MAPS

X1. Waimakariri Nutrient Allocation Zones

X2. Surface Water Allocation Zones – 1

X3. Surface Water Allocation Zones – 2

X4. Groundwater Allocation Zones

X5. Private water supply well areas

X6. Interzone Transfer Source Area

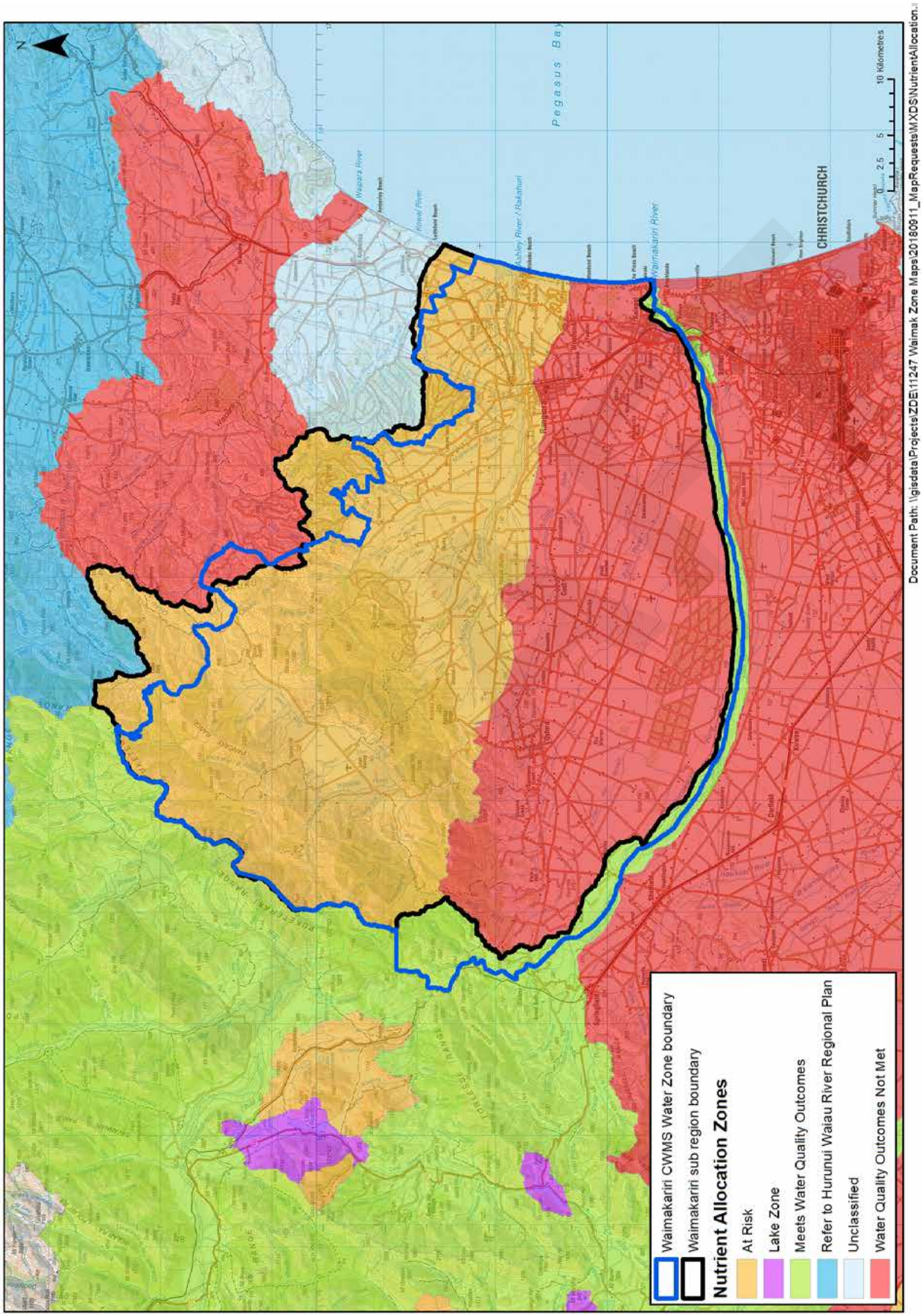
X7. Stream Recharge Zones

X8. Recommended Nitrate and Runoff Priority Management Areas

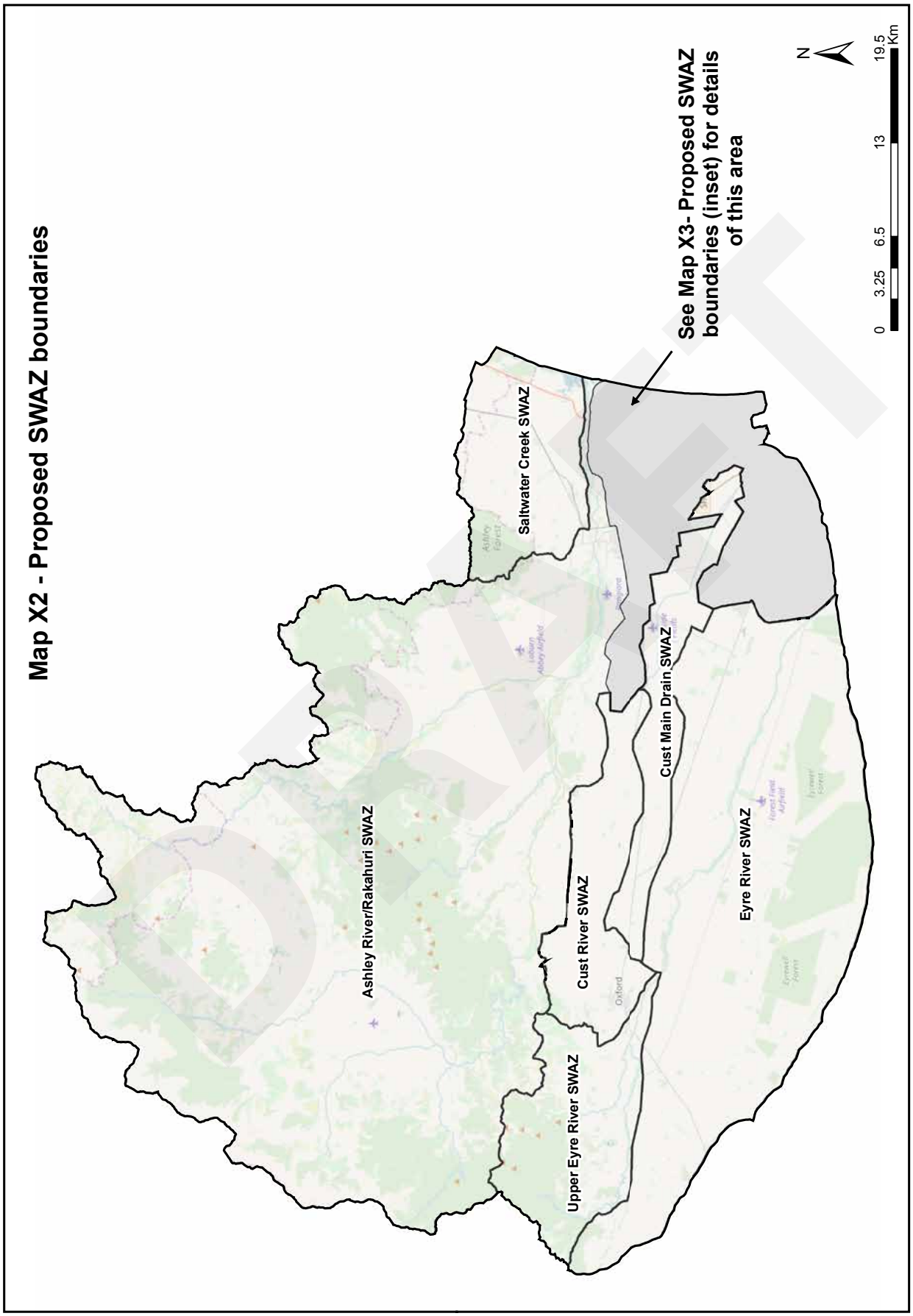
APPENDIX 2 – CANTERBURY REGIONAL BIODIVERSITY STRATEGY – SUMMARY

APPENDIX 3 – GLOSSARY

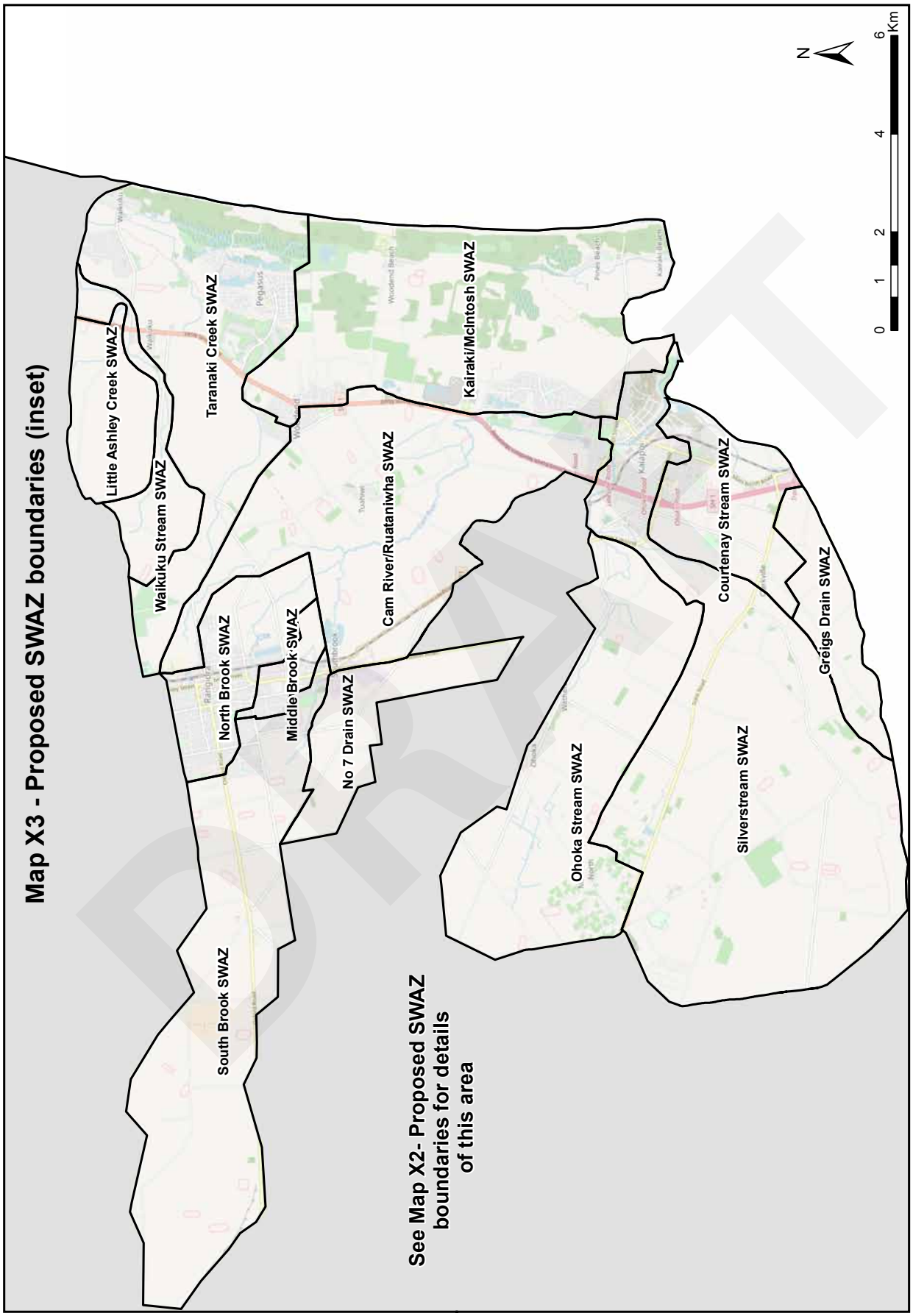
MAP X1. WAIMAKARIRI NUTRIENT ALLOCATION ZONES



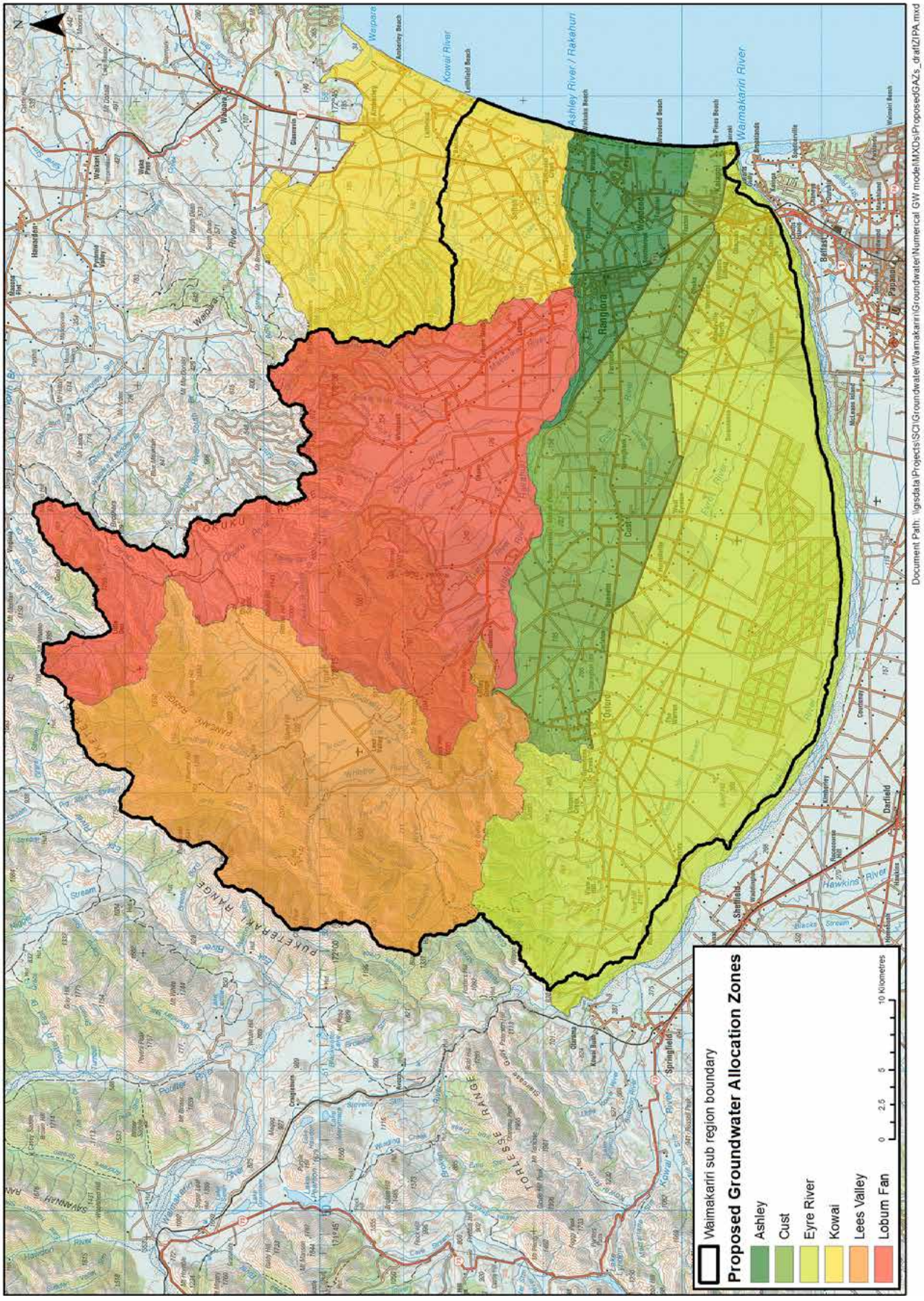
MAP X2. SURFACE WATER ALLOCATION ZONES – 1



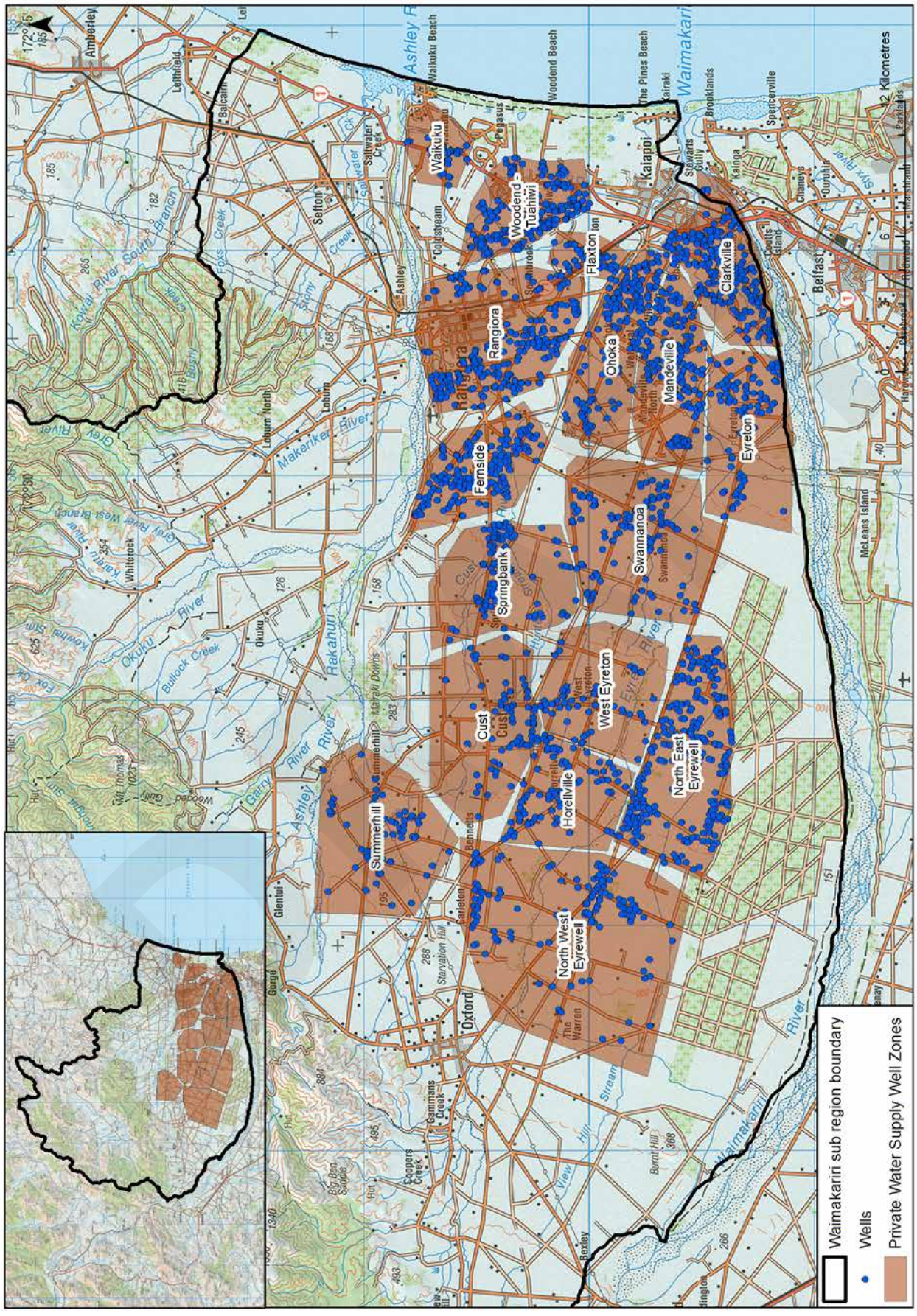
MAP X3. SURFACE WATER ALLOCATION ZONES – 2



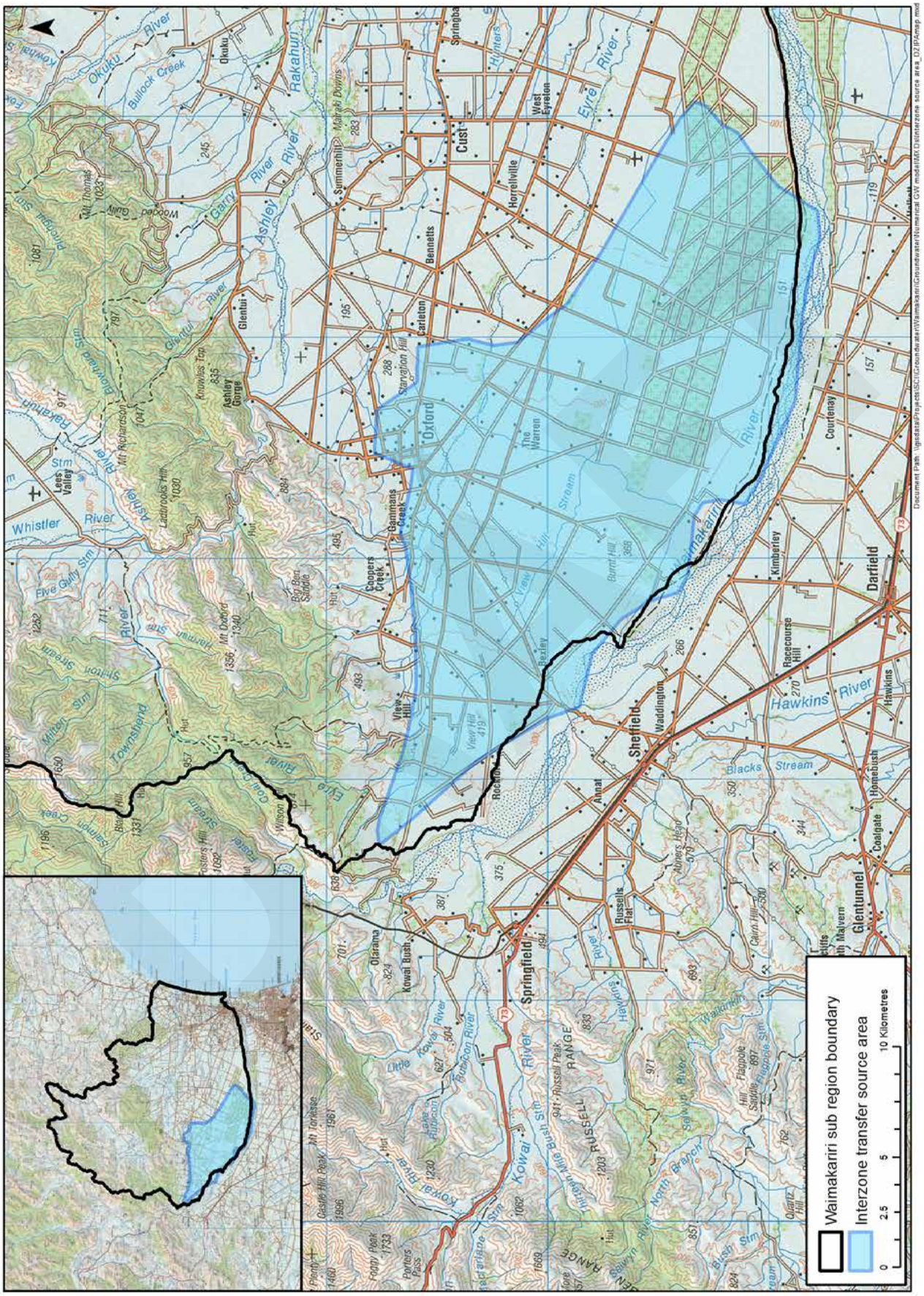
MAP X4. GROUNDWATER ALLOCATION ZONES



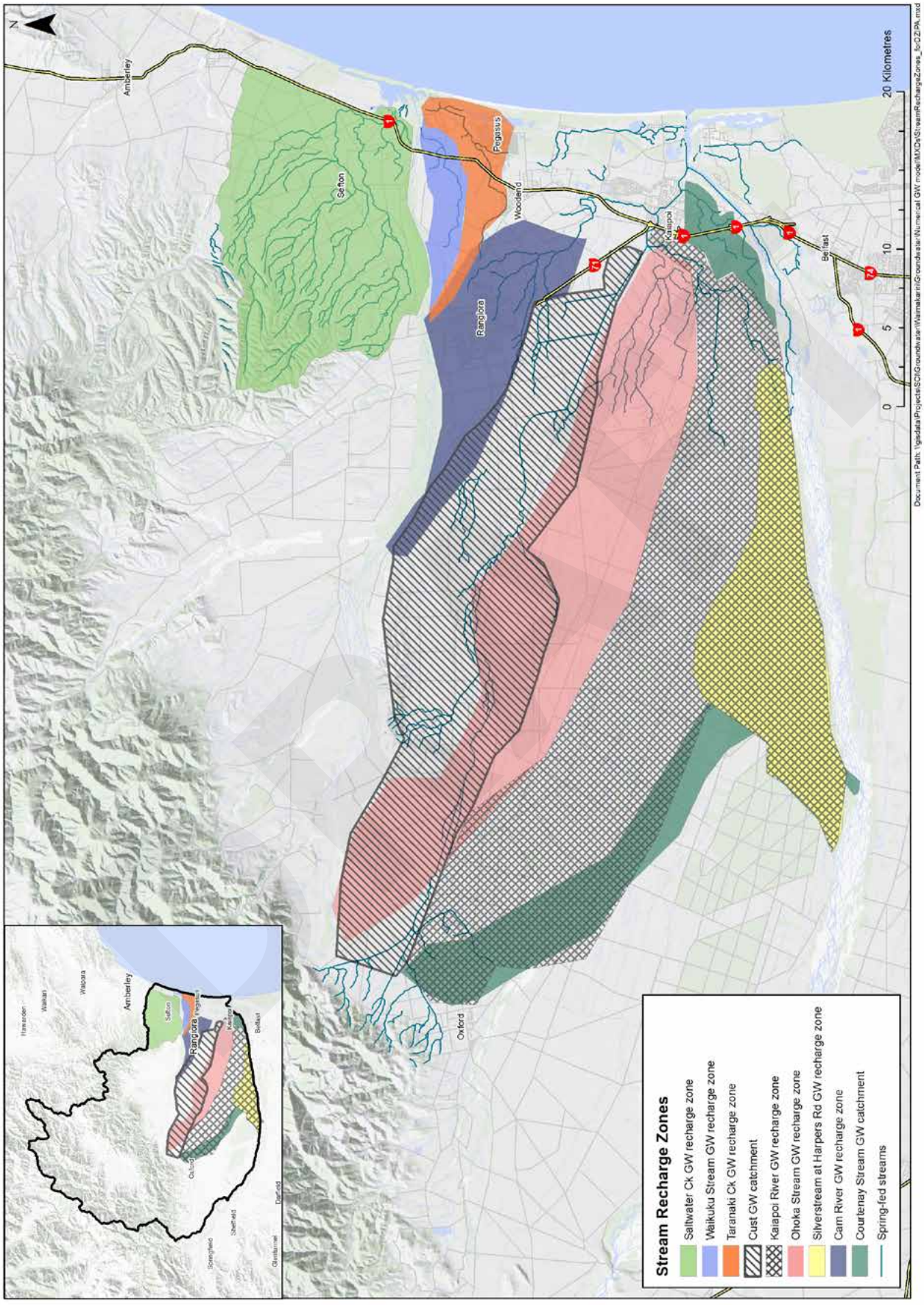
MAP X5. PRIVATE WATER SUPPLY WELL AREAS



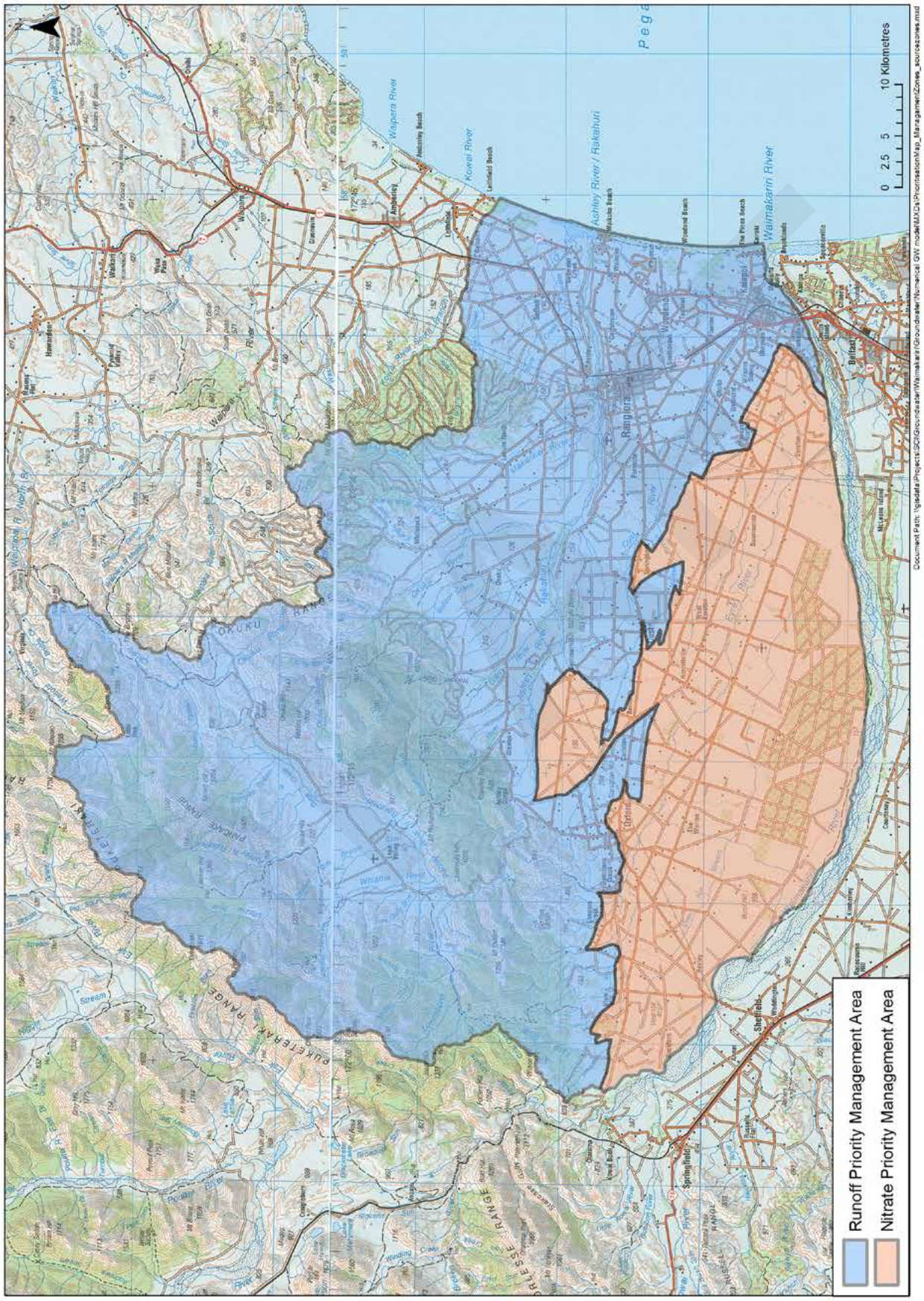
MAP X6. INTERZONE TRANSFER SOURCE AREA



MAP X7. STREAM RECHARGE ZONES



MAP X8. RECOMMENDED NITRATE AND RUNOFF PRIORITY MANAGEMENT AREAS



APPENDIX 2. CANTERBURY REGIONAL BIODIVERSITY STRATEGY – SUMMARY

Vision

"The Canterbury community values and cares for the region's biodiversity and accepts the shared responsibility to work together to ensure it is sustained and enhanced, both now and into the future.

As a result, there is a full range of healthy ecosystems stretching from the mountains to the sea, reflecting the unique and diverse natural character of the Canterbury region. Our indigenous biodiversity is an integral part of our everyday lives and landscapes, it complements the productivity of our sustainable economy and working lands, and where appropriate, it supports sustainable harvest."

Goals & Targets

Goal 1. Protect and maintain the health of all significant habitats and ecosystems.

Target 1. There is no further loss of significant habitats and ecosystems from 2010.

Goal 2. Restore the natural character of degraded indigenous habitats and ecosystems.

Target 2. There is an on-going increase in the number, quality and effectiveness of ecosystem-based restoration projects and initiatives, particularly in areas where less than 30% indigenous cover remains.

Goal 3. Increase the integration and sustainable use of indigenous species in modified environments (e.g. farm, urban, lifestyle blocks).

Target 3. Awareness of the multiple benefits of incorporating indigenous biodiversity into working and urban landscapes is increased by 2012.

Goal 4. Enhance public awareness, understanding and support of biodiversity.

Target 3. Public awareness, understanding and support of biodiversity is increased by 20% by 2012, leading to increasing instances of consequential behaviour change.

Goal 5. Encourage, celebrate and support action by landowners and communities to protect, maintain and restore biodiversity.

Target 5. The accessibility and usability of information, guidance, advice and funding relating to biodiversity protection and restoration is improved by 2012.

Goal 6. Improve the range and quality of knowledge and information about Canterbury's biodiversity for its sustainable management.

Target 6. A framework for monitoring the status of regional biodiversity is established by 2012.

APPENDIX 3 – GLOSSARY

Allocation Limit

The total amount of water (in litres per second and/or cubic metres per year) that is available to be taken from a river or groundwater. See also Plan Limit.

Artificial watercourse

A watercourse that is created by human action. It includes an irrigation canal, water supply race, canal for the supply of water for electricity power generation, and farm drainage canal channel.

Ashley River/Rakahuri and Tributaries

The area within the Makaira zone as shown on Map X Refer Map 4

Baseline GMP Loss Rate

The average nitrogen loss rate below the root zone, as estimated by the Farm Portal, for the farming activity carried out during the nitrogen baseline period (2009-13), if operated at good management practice

Catchment management plan

A non-statutory action plan that takes a holistic approach to addressing land and water issues within a catchment and sets out actions to be undertaken including what, where, when, by whom and costs.

Drain

Includes any artificial watercourse that has been constructed for land drainage of surface or sub-surface water and can be a farm drainage channel, an open race or subsurface pipe, tile or mole drain or culvert.

Future goal

This is a nitrate concentration, minimum flow or total allocation figure that is not recommended for inclusion in this sub-region plan change, due to a lack of certainty about a feasible pathway for achieving it.

The zone committee considers the future goals could eventually be achievable. For example, if mitigations such as managed aquifer recharge are proven over the next 5-10 years, this may make it feasible to achieve higher minimum flows or lower nitrate concentrations.

Accordingly, the Zone Committee expects the future goals listed in this ZIP Addendum will be revisited by Environment Canterbury at the 10-year plan review, and where possible, introduced into the plan as new statutory limits.

Good Management Practice or GMP The practices described in the document entitled "Industry-agreed Good Management Practices relating to water quality" dated 18 September 2015.

Good Management Practice Loss Rate

The average nitrogen loss rate below the root zone, as estimated by the Farm Portal, for the farming activity carried out over the most recent 4-year period, if operated at Good Management Practice.

Farm Environment Plan or FEP

A plan prepared in accordance with Schedule 7 of the LWRP. Applies to farming activities that require a land use consent and LWRP requires these to be audited periodically and performance graded A to D.

Farm Portal

Nutrient management database accessed at www.farmportal.ecan.govt.nz and used to derive a Baseline GMP Loss Rate and Good Management Practice Loss Rate.

Groundwater Allocation Zone or GAZ

A planning tool for determining an allocation limit and managing groundwater abstraction. GAZ are primarily based on areas of similar hydrogeology and recharge sources. Each GAZ has an allocation limit expressed as an annual volume in cubic metres per year. Their boundaries are set out in Planning Maps in the LWRP.

Land and Water Regional Plan or LWRP

Plan made under the Resource Management Act (1991) for managing land and water resources in Canterbury. It identifies resource management goals (objectives) and sets out the policies and rules to achieve them and direct the processing of resource consent applications.

Lifestyle Block Management Plan

A voluntary plan for small scale, low intensity lifestyle properties that are not required to produce a Farm Environment Plan or Management Plan under Plan Change 5. Useful for getting the best use out of lifestyle properties and addressing small issues that can help achieve environmental outcomes.

See template at:
https://www.canterburywater.farm/assets/Uploads/PU8C-6023-Lifestyle-Block-Management-Plan-October-20152.pdf

Plan limit

This is the nitrate concentration, minimum flow or total allocation figure recommended for inclusion in the sub-region plan change.

Where over-allocation is an issue (or for nitrates is expected to become an issue given lag effects), there may be a period of time where the plan limit is not achieved. The final ZIPA will include more details on likely timeframes for achieving plan limits in situations of over-allocation.

Management Plan A plan prepared in accordance with Schedule 7A in Plan Change 5 to the LWRP. Applies to permitted farming activities above a certain property size (currently 10 ha) that do not require a land use consent.

Minimum flow

The flow, when measured at the relevant water flow monitoring site, at which abstractions from a water body must cease.

Northern Waimakariri Tributaries

The area within the Waimakariri Water Zone as shown on Map B2 on page 8.

Over-allocation

The situation where the resource (water quantity and water quality) (a) has been allocated to users beyond a limit or (b) is being used to a point where a freshwater objective is no longer being met

Partial restrictions

Restrictions that reduce water takes as the river approaches its minimum flow, to prevent the minimum flow from being breached because of abstraction.

Plan Change 5 or PC5 (Nutrient Management Plan Change)

A plan change to the LWRP on managing nutrient losses from farming. When operative it will introduce new definitions, policies, rules, limits and schedules to require farming activities to operate at "Good Management Practice".

Surface Water Allocation Zone or SWAZ

A planning tool for managing surface water abstraction. SWAZ are based on river catchments and each SWAZ has an allocation limit expressed in litres per second and a minimum flow site to manage water takes.

Waimakariri River Regional Plan or WRRP

An older style separate regional plan that controls specific aspects of water quantity, water quality and works in river and lake beds within the Waimakariri River catchment. Any objectives, policy or rule on the same subject matter in the WRRP prevails over those in the LWRP.

Waimakariri Water Zone

The Waimakariri Water Zone Committee boundary under the CWMS. This is generally the same as the Waimakariri District boundary. See Map B1 on page 5.

Waimakariri sub-region

The area defined in Section 8 (Waimakariri) of the LWRP. The area is generally the same as the Waimakariri District Council boundary and the Waimakariri Zone boundary under the CWMS. See Map B1 on page 5.

PROVIDING FEEDBACK

THE ZONE COMMITTEE IS SEEKING YOUR FEEDBACK TO EXPAND OUR UNDERSTANDING OF FRESHWATER ISSUES AND HOW BEST TO ADDRESS THESE ISSUES.

Please provide your feedback by visiting **www.ecan.govt.nz/waimakariri-water** or email **waimakaririzone@ecan.govt.nz**

To provide direct feedback see us at one of the community workshops held in September and October 2018 or post your written feedback to:

Meredith Macdonald,
Environment Canterbury,
PO Box 345, Christchurch 8140.

FOR MORE INFORMATION VISIT: www.ecan.govt.nz/waimakariri-water

R18/63

WAIMAKARIRI
LAND&WATER
SOLUTIONS PROGRAMME

WAIMAKARIRI
DISTRICT COUNCIL

Environment
Canterbury
Regional Council
Kaunihera Taiao ki Waitaha