

# **CHRISTCHURCH WEST MELTON**

## **Draft Zone Implementation Programme (ZIP)**

November 2012

*[Insert photo strip]*

*[Insert text logos]*

## ZONE COMMITTEE MEMBERSHIP

Christchurch West Melton Zone Committee (the Committee) is a joint committee of Christchurch City Council, Selwyn District Council and Environment Canterbury Regional Council. The members of the Committee as of the 28 November 2012 public meeting are:

Ian Fox – Chair / Community member

Deidre Francis – Deputy Chair / Community member

Ann Winstanley – Community member

Hugh Thorpe – Community member

Jon Harding – Community member

Robert Wynn-Williams – Community member

Arapata Reuben – Te Rūnunga o Ngāi Tūāhuriri

Yvette Couch-Lewis - Te Hapū o Ngāti Wheke/Rapaki

*Vacant* - Te Rūnunga o Ngāi Taumutu

Councillor Debra Hasson – Selwyn District Council

Commissioner Rex Williams – Environment Canterbury

Councillor Sally Buck – Christchurch City Council

See <http://ecan.govt.nz/get-involved/canterburywater/committees/chch-west-melton/Pages/membership.aspx> for background information on committee members

Previous members of the Committee are:

Herena Stone - Te Hapū o Ngāti Wheke/Rapaki

Craig Pauling - Te Rūnunga o Ngāi Taumutu

With support from:

Matthew Ross – Environment Canterbury

Elizabeth Blayney – Christchurch City Council

Diane Shelander – Christchurch City Council

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## WHAKATAUKĪ

Ko o mātou whakaaro ki te whenua, ngā roto, ngā awa, te moana hei here ia tātou.

O ngā tuputupunga o Te Aka o Tū Whenua

Hei whakatō whakatipu i ngā mahinga kai

Our thoughts are to the land, to the lakes, the rivers and the sea that bind us  
together.

To preserve the well-being of the vines of Tū Whenua (land and water)

That gave rise to the people's food gathering places

## CHAIRMAN'S COMMENT

*[Insert text]*

## EXECUTIVE SUMMARY

[Insert text]

*Invitation for feedback:* The Committee welcomes written feedback on this draft Zone Implementation Programme (ZIP) – see feedback form at the end of this document.

Please send your feedback to [mailroom@ecan.govt.nz](mailto:mailroom@ecan.govt.nz), by 03 February 2012.

The Committee will present and discuss this draft ZIP at public meetings as follows:

18 December 2012, 7-9pm, at Wigram Manor, Wigram

24 January 2012, 7-9pm, at Wigram Manor, Wigram

***We welcome the opportunity to meet with organisations to discuss this draft ZIP. Please contact [admin@canterburywater.org.nz](mailto:admin@canterburywater.org.nz) if your organisation wishes to meet with us.***

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WORKING DRAFT FOR COMMITTEE

## 1. INTRODUCTION

### 1.1 SCOPE OF THE ZONE IMPLEMENTATION PROGRAMME

This Zone Implementation Programme (ZIP) is intended to guide the implementation of the Canterbury Water Management Strategy (CWMS) in the Christchurch West Melton Zone (the Zone). It aims to address all the CWMS targets, in so far as they are applicable to the Zone and contains *[Insert text]* recommendations for Environment Canterbury, Christchurch City Council, Selwyn District Council, and other agencies.

### 1.2 GEOGRAPHICAL SCOPE

The geographic area covered by the ZIP includes:

- The lower parts of the Waimakariri River
- Aquifers that are part of the Canterbury Plains groundwater system
- The Ōtūkaikino catchment
- Styx River / Pūrākaunui catchment
- Avon River / Ōtākaro catchment
- Heathcote River / Ōpāwaho catchment
- Avon-Heathcote Estuary / Ihutai
- The upper part of the Halswell River / Hurutini

The Zone includes a large part of Christchurch City Council's territorial area including all of urban Christchurch and parts of the Port Hills. The western part of the Zone is within Selwyn District.

*[Insert zone map including roads]*

### 1.3 BOUNDARIES WITH OTHER WATER MANAGEMENT ZONES

The Zone shares boundaries with Banks Peninsula, Selwyn-Waihora, and Waimakariri Zones, with water moving into and out of the Zone:

- The Waimakariri River flows through Christchurch West Melton, Selwyn-Waihora, and Waimakariri Zones
  - The Waimakariri upper catchment is in Selwyn-Waihora Zone
  - Christchurch West Melton shares a boundary with Waimakariri Zone along the lower parts of the catchment
- The aquifers in the Zone are part of a larger groundwater system on the Canterbury Plains, with water moving both into and out of the zone
- The Halswell River / Hurutini catchment flows from the Zone into Selwyn-Waihora Zone (towards Te Waihora / Lake Ellesmere)
- The reticulated public water supply to Lyttelton Harbour / Whakaraupo is supplied from groundwater in the the Zone

In addition, there is a Regional Committee for the Canterbury Water Management Strategy (CWMS) that considers cross-boundary matters from a regional perspective.

The Zone Committee will seek to ensure an integrated approach to water management is taken that reflects catchments rather than administrative boundaries.

## **1.4ZONE COMMITTEE PROCESS**

The Committee was established under the auspices of the Local Government Act 2002 in accordance with the Canterbury Water Management Strategy (2009). This is a joint Committee of Environment Canterbury (the Regional Council), Christchurch City Council and Selwyn District Council (the Territorial Authorities).

The Committee was set up in November 2011 to prepare and periodically review a Zone Implementation Programme (ZIP) giving effect to the CWMS in the Christchurch West Melton Zone. The collaborative CWMS approach and consensual decision making has been sought on all decisions.

The membership reflects the need for the group to work collaboratively, considering the implementation of the Principles, Priorities, and Targets of the CWMS in the Zone and includes:

- 1 member appointed by the Regional Council
- 1 member appointed by each Territorial Authority (Christchurch City Council & Selwyn District Council)
- 1 member appointed by each Rūnanga (Te Rūnanga o Ngāi Tūāhuriri, Te Hapū o Ngāti Wheke/Rapaki, Te Rūnanga o Ngāi Taumutu)
- Between 4-7 members from the community, chosen from a range of backgrounds and interests, jointly appointed by the Regional Council and Territorial Authorities

Community members were selected (both as individuals and in combination as a group of people) for their knowledge of water management, connections with the zone, and their ability to work collaboratively. The selection process was open to all members of the public and included written applications and workshop sessions. The selection panel included representatives of Environment Canterbury, Christchurch City Council, and Rūnanga.

The Committee has held *[Insert text]* public meetings and *[Insert text]* informal workshops since orientation in October 2011. The Committee has been briefed about surface and groundwater resources (including quality and quantity/flows); ecosystems and biodiversity; cultural values and aspirations; regional planning; wastewater management; stormwater management; water supply; water use; pollution incidents; flood management activities; recreation; earthquake impacts; public communications and awareness raising initiatives. The Committee met, and discussed zone water issues with a number of community groups and government agencies. In addition the Committee has undertaken three fieldtrips.

Environment Canterbury provides the staff to facilitate the committee process with Christchurch City Council providing the secretarial support, with access to technical support from Christchurch City Council, Environment Canterbury, and Selwyn District Council as necessary. Additional technical expertise has been sought where required.

## **1.5DEVELOPING THE ZONE IMPLEMENTATION PROGRAMME (ZIP)**

This ZIP has been developed in the context of the Principles, Priorities, and Targets of the CWMS as relevant to the Christchurch West Melton Zone. It has been developed as a package of priority outcomes and recommendations that complement and support each other. To successfully implement the CWMS in this zone, the entire package of recommendations will need to be adopted.



The CWMS established the importance of involving local people in the integrated management of water at a local level. The Committee acknowledges the significant contribution in time and effort that is already being made on water related issues by community groups and other organisations in the zone.

The challenges and opportunities related to water management at a local level reflect the aspirations and concerns of local people. These aspirations and concerns include how water is used or not used, and the need to take the specific nature of the local environment and waterways (e.g. size of rivers, number of wetlands) into account.

The Committee has identified five Priority Issues that it believes need to be addressed urgently in the zone in order to implement the CWMS (not in order of priority):

- Enhancing and managing waterways for recreation, relaxation and amenity
- Improving surface water quality and safeguarding surface water flows
- Enhancing healthy ecosystems, native biodiversity, and valued introduced species
- Safeguarding groundwater quality and flows for multiple uses
- Making efficient use of water and managing demand

The Committee has recommended specific actions to help achieve outcomes for each priority. Note that these five Priority Issues are a subset of the CWMS. An explanation of how the Priority Outcomes and Recommendations contribute to the CWMS is included in this draft ZIP.. The Committee will include a more detailed cross-referencing of our recommendations with CWMS Targets in the final ZIP.

In addition, the committee has identified a number of “Key Principles that are woven throughout the ZIP, which must be taken into account when Priority Outcomes and Recommendations are being implemented. These Key Principles are:

- Kaitiakitanga
- Better integration of plans and collaboration between agencies and groups
- Earthquake recovery programmes help to implement the CWMS in the Zone.
- Local people are involved in improving water management
- The effects of improving flood management are beneficial to a spectrum of waterway values.

*[Insert diagram of CWMS and links to Key Principles, Priority Issues, Priority Outcomes, and Recommendations]*

This draft ZIP is written to advise decision makers about the actions that the Committee believes are needed to meet the CWMS Targets within the zone. The CWMS Targets were agreed through the initial CWMS process and signed off by the Regional Council and Canterbury’s territorial authorities. We have focused on what needs to be done to achieve the CWMS targets within their stated time frames. The Committee did not consider the level of resourcing available for achieving the Recommendations. This is because the CWMS has a 30 year vision and it is inevitable that budgets and resources will vary over this period.

This first draft ZIP takes a deliberately high level view of water management. There are a number of well-developed local government strategies and plans and a variety of different organisations and community groups already actively involved in water management in the zone. The key goal of this first ZIP is to ensure that these strategies, plans, and programmes align with the CWMS and with local priorities. Alignment will lead to more catchment specific recommendations in future ZIPs and in many instances the Committee have recommended, as a priority, that a collaborative approach be established at a catchment level to facilitate this. Considering issues from a catchment level will encourage a flexible and focussed approach to improving water management. Furthermore, with the rapid rebuild in post-earthquake Christchurch, the committee anticipates the need to produce an updated version of this first ZIP within approximately 12 months.

For clarity, timeframes have been identified for individual recommendations. This is based on the:

- timeframes for the relevant CWMS Target,
- type of action requested,
- a reasonable period of time to achieve the outcomes,
- the urgency with which the Committee thinks the recommendation needs to be carried to a conclusion.

The committee acknowledges that it has **not** considered whether this timeframe is achievable for the organisations named against recommendations.

The committee anticipates that it will receive comments and feedback on the timeframes, affordability, resource availability etc. as part of the public and stakeholder engagement process. This will be used to help inform the development of the final ZIP. Once the final ZIP is formally presented to Councils, the committee hopes to receive a response as to how the councils will give effect to the ZIP. The committee recognises that this response will clearly be dictated by resource availability etc. and may require the committee to prioritise.

The Committee cannot commit the organisations or groups named in the ZIP to specific courses of spending, policy or operations. The Committee however hope that those identified as being able to help implement the CWMS in the zone will contribute where possible, towards achieving the priority outcomes and recommendations in the ZIP.

Finally, it is important to note that the sequence in which the key principles, priority issues, priority outcomes, and recommendations are included in this document, does not imply any order of relative importance or urgency.

## **2. CHRISTCHURCH WEST MELTON ZONE OVERVIEW**

### **2.1 STATE OF WATER RESOURCES**

#### **2.1.1 WAIMAKARIRI RIVER CATCHMENT**

The Waimakariri River is one of the largest rivers in North Canterbury and originates in the main divide of the Southern Alps. The catchment is about 2600 square kilometres in area and flows are snow and rain fed with floods and freshes occurring mostly in north-west weather. The catchment provides water for multiple uses in the CWMS zones of Selwyn Waihora, Christchurch West Melton and the Waimakairiri.

The extensive upper headwaters of the Waimakariri are little modified by human activity. The river leaves the gorge at Kowai Bush north of Springfield, crossing the Canterbury plains for the last 60 km of its course. At the river mouth there is an extensive estuary of high value native plant, animal and bird life.

The lower part of the Waimakariri River forms the northern boundary of the Zone. The western boundary is Intake Road. These lower reaches have been highly modified by stop banks, groynes, in-stream tracks, artificial channels and willow covered margins to manage flooding. The river berms and associated riparian wetlands also support high numbers of endemic, specialised river-bird species, invertebrates, fish and native plants.. These areas are among the largest remaining in the Canterbury region.

Water leaks through the bed and banks of the Waimakariri River from Halkett downstream, recharging the riparian aquifers, contributing to a huge groundwater resource stored in the gravels beneath the plains. This groundwater flows towards Christchurch and is abstracted for multiple uses. Much of this groundwater re-surfaces in springs feeding the streams on the lower plains, including the Otukaikino (South Branch of Waimakariri), Styx River / Pūrākaunui, Avon River / Ōtākaro, Heathcote River / Ōpāwaho and Halswell/Hurutini.

The Waimakariri is one of the most heavily used rivers for recreation in New Zealand because of its proximity to Christchurch.

The Waimakariri River catchment had and still has today an important role in the wellbeing of the local Ngāi Tahu whānui. When the first European settlers looked out over the Waimakariri River catchment from the top of the Bridal Path they saw a swamp land that needed to be drained.

Ngāi Tahu saw the same swamp-land and enormous expanse of waterways as being a place full of mahinga kai. The catchment provided freshwater and saltwater fish species and shellfish. There was an abundance of bird life for kai and raranga (weaving) material, numerous plant and natural materials for building whare, waka, and rongoa species. The estuaries and swamps provided raupo, harakeke and pingao, mud, soils, tree bark and berries for dyes, and plant seeds for oils. It was a place of significance. The abundance of natural resources ensured the welfare and future of the people. Those with resources flourished, while those without perished. Therefore, the management and maintenance of resources was and is the foremost concern. This inter-

dependence relationship with the environment is central to Māori creation stories, religious belief, and resource management techniques within the Waimakariri River catchment.

### 2.1.2 GROUNDWATER

The Christchurch West Melton aquifer system is a segment of the extensive groundwater system of the Canterbury Plains. Groundwater occupies the pore spaces of the unconsolidated gravels, sands and silts that make up the plains. The aquifers of the Christchurch West Melton system are recharged by relatively constant leakage from the Waimakariri River, supplemented by seasonably variable rainfall on the land between the River and the City which filters down through the soil to the water table.

Groundwater flow is generally from west to east, from the mountains towards the sea. Some groundwater flows out underneath Christchurch at depth into the ocean, but a large proportion of the flow resurfaces as springs feeding groundwater-dependent streams. The volcanic rocks of the Port Hills form a barrier to groundwater flow, diverting the groundwater either side of Banks Peninsula i.e. eastwards underneath Christchurch towards the sea, or southwards towards Te Waihora / Lake Ellesmere. The southern boundary of the Christchurch West Melton zone approximates a 'groundwater divide' between these two components of groundwater flow.

Changes in sea level over past cycles of glaciation have resulted in alternating layers of coarse river gravels and fine marine or estuarine silty deposits near the coast creating a sequence of five (or more) distinct gravel aquifers beneath the city, sandwiched between finer-grained confining layers. In this coastal confined aquifer system, pressures are higher in the deep aquifers and there is a slow upward movement of water from any one aquifer into the aquifer immediately above it. When this water eventually reaches the top (Riccarton gravel) aquifer it flows coastwards and emerges at some point offshore. The deeper aquifers are presumed to be "blind". The confining layers are not impermeable to flow and it is this upward flow as much as the fine-grained sediments that protect the deeper aquifers from contamination entering via the land surface near the coast. The confining layers thin towards the west. The margin of the top confining layer is highly irregular but broadly speaking it does not extend beyond Johns/Russley Roads. Still further west there is no confining layer and groundwater is vulnerable because contaminated water can move relatively easily down from the surface to the water table.

The Christchurch West Melton groundwater system has had a long history of abstraction for public water supply, industry and agriculture. It needs no treatment and provides almost all of the area's drinking water, valued by both the people and industries of Christchurch.

Water is a taonga. Water is often referred to as the veins of Papatūānuku; it represents the lifeblood of the environment and is embodied in the traditional values, controls and spiritual beliefs and practices. The maintenance of water quality and quantity is of absolute importance for mahinga kai. Both surface and ground water play an equal part in the well-being of the people.

Before drainage there were possible tributary links across the catchment between the Waimakariri River to Otakaroro, Ihutai, Opawaho, Hurutini, Ahuriri to Te Waihora with all connections to the extensive wetlands. Ngāi Tahu followed these main waterways and their tributaries in its maintenance of the food-rich wetlands. Today the great wetlands are no longer evident. The

people of the land had appreciation for the importance of the interconnection between both sources and the need to manage them collectively. A culturally holistic approach considers that all waterways above and below ground are significant. Ki atu ki tai, flowing from the mountains connecting the rivers, streams, estuaries, and wetlands, all leading out to the coast; all is one.

### 2.1.3 ŌTUKAIKINO RIVER CATCHMENT

The Ōtūkaikino River arises from a system of spring-fed streams and wetlands between the Airport and McLeans Island. Prior to river control works that have confined the braided river to its current course it was known as the “South Branch” of the Waimakariri River. The catchment is primarily rural grazing land with some areas designated for residential development, e.g. Clearwater, other areas used for recreation, e.g. the Groynes and some is used for gravel extraction.

The values within the Ōtūkaikino river catchment of Ngā taonga tūku iho (Mauri, Mahinga kai, Wāhi Taonga, Wāhi Raranga, Hāpua, Waiora, Waipuna and Urupā) to uphold the water quality and quantity values and protection of the waterway margins and wetlands ensures non-pollution of waterways and prevents destruction of wāhi tapu sites.

The Ōtūkaikino retains high aquatic ecological values, with native fish populations as well as a high value trout sports fishery. The invertebrate communities in the Ōtūkaikino River represent the healthiest aquatic ecosystem in the Christchurch area. Water quality is generally good due to the close connection with the Waimakariri River, but faecal contamination has been a problem for many years related to livestock access to waterways and large populations of waterfowl at the Groynes. The river and its associated wetland areas have high value for native birdlife, both wetland and forest species, and contain good remnants of native plants.

### 2.1.4 STYX / PŪRĀKAUNUI RIVER CATCHMENT

The Styx/ Puharakekenui River and surrounding swamp land was rich in mahinga kai and has been designated as an important source of food gathering. The role that the food gatherer was accorded was very significant in the contribution to the sustenance of the community and its families. The food gatherers were loved by all and acted with humility as they provided the means in which hospitality could be affected and gifting arranged. A food gatherer would take food to the homes and give families a proportion of the catch. This process was known as Kai Hau Kai and was based upon the reinforcement of Whanaungatanga (networking with families).

The Styx River / Pūrākaunui channel can be traced back as far as Nunweek Park where it is usually dry. It has a small flow at Sawyers Arms road but is boosted strongly by large springs before reaching Gardiners road, with more downstream, notably Redwood spring. Below Nunweek Park the Styx flows through a mix of residential, conservation, rural and lifestyle land uses before exiting into Brooklands Lagoon adjacent to the mouth of the Waimakariri River. Tide gates at Brooklands minimise the impact of high tides on water levels in the lower river, which is in an area of low lying land that is subject to flooding. Earthquake induced land subsidence around Brooklands suggests that flooding in this area will worsen. The Styx River / Pūrākaunui has two main tributaries, Smacks and Kaputone Creeks, with additional inflow from a series of land drainage channels that historically enabled the conversion of boggy peat land into market gardens and grazing land in the south and east of the catchment. There is a history of industrial land use along Johns Road and in the Belfast

area, with discharges from the latter into Kaputone Creek that affected the water quality and ecology of this waterway. Further large residential development in the catchment is imminent but with stormwater treatment systems mandated to minimise the impacts of stormwater on flooding, water quality and ecology of the river.

The Styx River / Pūrākaunui has relatively high ecological values for an urban waterway, with a diverse fish community and healthy invertebrate populations in the upper wadeable reaches of the river. Remnant saltmarsh ecosystems can be found downstream of the tide gates. Water quality is generally good, although existing stormwater runoff increases sediment and contaminant loads in the river and livestock access to waterways is also a source of sediment and faecal contamination in some areas. Extensive macrophyte (aquatic weed) growth is periodically removed from the river to mitigate flood risk. Land subsidence in the middle and lower reaches of the river is indicated by higher water levels (relative to land) even in normal conditions. This will affect flood management.

### 2.1.5 AVON / ŌTĀKARO RIVER CATCHMENT

The Avon River / Ōtākaro is spring-fed and flows slowly from the northwest of Christchurch, through the central city and the eastern suburbs to the northern apex of the Avon-Heathcote Estuary/Ihutai. A dry channel crosses Russley Road and the Ilam stream at Crosbie Park carries a small flow sourced from the Paparua stockwater race but the first point on the Avon proper at which water is usually present is at Balrudry Street. There are a number of tributaries, both natural streams and drains. The catchment is very flat, almost completely urbanised, with a mix of residential, commercial and agricultural land use. A small part of the catchment in the Cranford Street basin and north of QE II Drive remains in market gardens and grazing land. Some of the latter area drains to the Styx River / Pūrākaunui catchment.

The Avon River / Ōtākaro has high heritage, cultural, amenity and recreational values. Water quality is affected by the quality of groundwater in the shallow aquifers feeding the springs, which is very good but subsequently degraded by stormwater inputs, occasional wastewater overflows, and large populations of waterfowl. The catchment has been urbanised for many years and most of the stormwater discharged to the river is untreated. Water quality in some tributaries such as Addington and Riccarton drains is poor and unexplained fish kills (primarily eels) are occasionally reported.

Aquatic ecology values in the Avon River / Ōtākaro have declined in the last few decades, primarily as a result of fine sediment deposition on the river bed and reduction in habitat diversity. Sediment deposition has been greatly affected by liquefaction processes. The lower river has a diverse fish community and good examples of inanga spawning habitat. The river and tributary streams in the upper catchment have good riparian plant cover but this reduces downstream as the river widens and becomes tidal in the lower reaches. Extensive macrophyte (aquatic weed) growth is periodically removed from the river to mitigate flood risk.

### 2.1.6 HEATHCOTE / ŌPAWAHO RIVER CATCHMENT

The Heathcote River / Ōpāwaho and its tributaries are in the south of Christchurch and approximately one-third of the catchment is on the Port Hills. Cashmere Stream is a significant spring-fed tributary including both hill and flat land in its sub-catchment. The upper river is also spring-fed but receives flow from the Sockburn industrial sub-catchment of Haytons Stream before

joining with Cashmere Stream. Hendersons Basin in the upper catchment is very low lying and is designated as a flood management area to mitigate flooding in the lower catchment. Flood risk is also managed by gates in the lower river at the Woolston Cut, which open to ease flood flows and reduce water levels upstream. Under normal conditions the gates are closed and flows follow the old channel. This prevents salt water flowing further upstream and damaging freshwater ecosystems.

The Port Hills land is covered by highly erodible loess soils. Development on the hills, combined with a reduction in vegetation, has resulted in considerable fine sediment input to Cashmere Stream and the Heathcote River / Ōpāwaho over the years. Many of the streams draining the Port Hills are ephemeral. Apart from the upper Cashmere Stream water quality in the river system is poor. As with the other urban rivers it is affected by the quality of shallow groundwater feeding the springs, occasional industrial discharges (accidental and/or illegal), sediment-laden runoff from the Port Hills, stormwater from rural, industrial, commercial and residential land use, occasional wastewater overflows and large populations of wildfowl. Water quality in Cashmere Stream is relatively good, while it is very poor in the industrial catchment of Sockburn/Wigram draining into Haytons Stream.

From early European settlement until the 1960s the lower Heathcote River / Ōpāwaho was used for discharging waste from a range of industries in the Woolston area. Despite the heavy historical human impacts the lower river in the vicinity of the Avon-Heathcote Estuary / Ihutai retains significant ecological values but is still greatly impacted. Further upstream, Cashmere Stream has high aquatic ecological values indicated by the presence of freshwater mussel and crayfish (koura) populations. The ecological values of the mainstem have also been impacted by fine sediment deposition resulting in reduced habitat diversity. Extensive macrophyte (aquatic weed) growth is periodically removed from the river to mitigate flood risk.

### 2.1.7 AVON-HEATHCOTE ESTUARY / IHUTAI

Ihutai estuary, the Ōpawaho and Hurutini river are at the foot of Ka-Kohatu-Whakarakaraka-a-Tamatea-Pokai-Whenua (Port Hills) there was significant settlement by Waitaha, Ngati Mamoe and later invasion and conquering of these lands and waterways by Ngāi Tahu who settled within Whakaraupo. The son of Te Rakiwhakaputa, Te Wheke, was left as kaitiaki of Ka-Kohatu-Whakarakaraka-a-Tamatea-Pokai-Whenua (Port Hills) to the Ōpawaho river and estuary (Heathcote valley), Hurutini (Halswell River) and to the Kaituna River.

This lead to pathways from Whakaraupo over the Port Hills to the Ōpawaho and Hurutini River catchments for the purpose of gathering and trading of mahinga kai and kaimoana. These pathways were part of a large network of food resources and trading between whānau. Such trading helped maintain tribal connections throughout the south.

Te Ihutai and its catchment are of immense cultural and historical importance to Tangata Whenua, being a place of significant settlement and food gathering by Waitaha, Ngati Mamoe and Ngāi Tahu for over 600 years. Sites along both the Avon and Heathcote Rivers, in and around the estuary, and on the coastline near the mouth of the estuary were known and used due to the availability and abundance of mahinga kai resources. Freshwater fish and shellfish, as well as numerous native plant resources, waterfowl and forest birds could be gathered from the network of springs, waterways,

swamps, grasslands and lowland podocarp forests that made up the estuary catchment, much of which was still present at the time of European settlement (Tau, Goodall, Palmer & Tau 1990; Christchurch City Libraries 2006; Christchurch City Council 2007).

Ōpawaho has seen four centuries of fishing. The awa is susceptible to flooding within its catchment. With sufficient time and intensity the Ōpawaho will ultimately overflow its banks and flood the adjacent land. However, the floodplains were a good place to settle as they were flat and fertile and adjacent to a water supply, and means of transportation.

Tangata Whenua had a close relationship with the estuaries and their tributaries for protection, transport and food, including: shellfish, inanga, flounder and tuna. In the lower reaches, the inanga would come and spawn along the awa on the river grasses. The swamp forest around small streams such as Stream Wharf provided gathering grounds for water fowl and forest birds including pukeko, weka and tui.

### 2.1.8 HALSWELL / HURUTINI RIVER CATCHMENT

The upper Halswell River / Hurutini lies within the Christchurch West Melton Zone while the remainder of the catchment is in the Selwyn Waihora Zone. It follows a meandering path through farmland from its spring-fed origins west of Oaklands and Halswell to the northern shore of Te Waihora / Lake Ellesmere. The upper tributaries of Knights Stream, Nottingham Stream and the Quaifes Road drain system are spring-fed and converge just south of Halswell to form the mainstem. Ephemeral streams draining the Port Hills also flow into the upper river. The Nottingham Stream sub-catchment is almost completely urbanised, while the remainder of the catchment comprises largely rural and lifestyle land use. Very large residential development in the Wigram/Halswell area is underway and much more is planned over the next few decades. Best Practice stormwater management and treatment systems designed to minimise the impacts of stormwater on flooding, water quality and ecology of the river have been mandated.

Water quality in the upper Halswell River / Hurutini is generally poor. The quality of groundwater in the springs is very good but urban stormwater, runoff from rural land and rural land management practices combine to degrade river water quality. The aquatic ecological values of the river are variable. Some areas have high value, such as the Quaifes Road spring-fed drain system where freshwater crayfish and diverse invertebrate populations are found, while other areas have been affected by a reduction in habitat quality which has reduced ecological values. A diverse fish assemblage is found in the lower river, with some species likely to use the upper reaches as a spawning, rearing and/or refuge area. Extensive macrophyte (aquatic weed) growth is periodically removed from the river to mitigate flood risk.



## 2.2CONTEXT

### 2.2.1 MANA WHENUA

#### Te Rūnanga o Ngāi Tahu Act

Te Rūnanga o Ngāi Tahu is the tribal representative body of Ngāi Tahu Whānui. It is a body corporate established on 24<sup>th</sup> April 1996 under section 16 of Te Rūnanga o Ngāi Tahu Act 1996 (“the Act”). Section 3 of the Act states:

*This Act binds the Crown and every person* (including any body politic or corporate) whose rights are affected by any provisions of this Act.

Section 15(1) of the Act states:

*Te Rūnanga o Ngāi Tahu shall be recognised for all purposes as the representative of Ngāi Tahu Whānui.*

Section 9 (2) of the Ngāi Tahu Claims Settlement Act 1998 clearly states the definition of Ngāi Tahu and Ngāi Tahu Whānui as being:

*... the collective of individuals who descend from the primary hapū of Waitaha, and Ngāti Mamoe and Ngāi Tahu.*

The Takiwā of Ngāi Tahu, i.e. that area where Ngāi Tahu are Tangata Whenua, is also clearly articulated in both the ‘Te Rūnanga o Ngāi Tahu Act’ and the 1998 ‘Ngāi Tahu Claims Settlement Act’.

Te Rūnanga o Ngāi Tahu consists of 18 constituent Papatipu Rūnanga, each of which is identified in the First Schedule of the Te Rūnanga o Ngāi Tahu Act along with a description of each Papatipu Rūnanga’s area of authority.

#### Tūāhuriri Rūnanga

That Schedule declares the Ngāi Tūāhuriri Rūnanga as the Rūnanga holding Mana Whenua within the Christchurch catchment. *“The takiwā of Te Ngai Tuahuriri Runanga centres on Tuahiwi and extends from the Hurunui to Hakatere, sharing an interest with Arowhenua Runanga northwards to Rakaia, and thence inland to the Main Divide.”*

#### Te Taumutu Rūnanga

The boundary description for the Taumutu Rūnanga is described as *“The takiwā of Taumutu Runanga centres on Taumutu and the waters of Te Waihora and adjoining lands and shares a common interest with Te Ngai Tuahuriri Runanga and Te Runanga o Arowhenua in the area south to Hakatere.”*

#### Rāpaki Runanga

Likewise, the boundary of the Rāpaki Rūnanga is described as *“The takiwā of Rāpaki Runanga centres on Rāpaki and includes the catchment of Whakaraupō and Te Kaituna.”*

### Mana Whenua

Traditional Maori rights to resources were founded on the mana whenua of a particular Tribe which was based on the lands, waterways and all resources controlled by the Tribe.

Manawhenua is described as the political and occupational authority over a particular area, usually defined by natural boundaries. The verbal expression of a Tribe's manawhenua typically refers to dominant physical features such as mountains, rivers and lakes.

### Rangatiratanga

Rangatiratanga was traditionally embodied in the concepts of Turangawaewae and manawhenua which centered on the status, role and authority of the rangatira (chief) of the group. He or she was the embodiment of the Tribe and carried the practical, moral and spiritual focus of the community.

The rangatira obtained their tapu (spiritual protection) and mana (authority, influence) from a combination of their Whakapapa, personality and ability. While the rangatira exercised their mana on behalf of the tribal group, that mana was dependent on the continued recognition and support of the tribal members both as individuals and as a group.

In this way land areas were, in practice, controlled by local hapu (sub-tribe) for their own benefit and the benefit of those other tribal members who had usage rights there. This also reinforced the philosophy that the welfare of the group as a whole was paramount to the welfare of any sub-group or individual within that group.

## 2.2.2 NATIONAL POLICY STATEMENT ON FRESHWATER

The National Policy Statement on Freshwater sets out the objectives and policies that direct local government to manage water in an integrated and sustainable way, whilst providing for economic growth within set water quality and quantity limits that reflect both local and national values.

The CWMS, through the establishment of Zone Committees and the development of Zone Implementation Programmes, provides an opportunity for local communities to contribute to the identification of shared values at a local and regional level.

## 2.2.3 RECOVERY STRATEGY FOR GREATER CHRISTCHURCH / MAHERE HAUMANUTANGA O WAITAHA

The Recovery Strategy for Greater Christchurch / Mahere Haumanutanga o Waitaha is the key reference document that guides and co-ordinates the programmes of work including Recovery Plans, under the Canterbury Earthquake Recovery Act. The six components of recovery are:

- Leadership and integration
- Economic recovery
- Social recovery
- Cultural recovery
- Built environment recovery
- Natural environment recovery

The Committee notes that there are synergies at a high level between the Greater Christchurch Recovery Strategy, and the Canterbury Water Management Strategy. There may be opportunities for the Programmes being developed to implement the Recovery Strategy to also assist with the implementation of the CWMS (and Christchurch West Melton ZIP). Recovery Programmes such as the Natural Environment Recovery Programme, the Infrastructure Programme and the Residential Red Zone Programme have particular opportunities to progress the ZIP's recommendations. The Committee, however, acknowledges that the scope of the Recovery Programmes is wider than water management alone, and that this may constrain the degree to which alignment is possible.

More information on the Recovery Strategy can be found at <http://cera.govt.nz/recovery-strategy/overview>

## 2.2.4 REGIONAL AND DISTRICT PLANNING

The regulatory framework for managing water resources is through the Resource Management Act 1991 and the associated statutory plans at a district and regional level.

Environment Canterbury notified the proposed Land and Water Regional Plan (pLWRP) in August 2012. The pLWRP includes regional level objectives, policies and rules that relate to the management of water in Christchurch West Melton Zone. In addition, the pLWRP includes a sub-regional chapter on the Zone. As the draft ZIP was still being developed at the point that the pLWRP was notified, the Committee has had limited involvement with the development of the pLWRP to date. In due course, it is anticipated that this ZIP will help to inform the relevant sub-regional chapter of the pLWRP.

The sub-regional chapter of the pLWRP for Selwyn-Waihora is currently being developed. A small area of the Christchurch West Melton Zone is included in the scope of the Selwyn-Waihora sub-regional chapter to better reflect groundwater boundaries and surface water catchments. The Committee will work with Environment Canterbury and other relevant CWMS committees to highlight cross-zone matters where appropriate and necessary as identified in the Christchurch West Melton ZIP.

The Christchurch City Plan is a document prepared under the Resource Management Act 1991. Its purpose is to provide a framework for managing the effects of land use and subdivision within the City. The geographic area to which the City Plan applies are those areas of Christchurch that pre-date the amalgamation with the former Banks Peninsula District Council in 2006. The Banks Peninsula District Plan applies to the geographic area of the former Banks Peninsula District Council. The City Plan consists of three volumes: Volume 1 - Statement of Issues, Volume 2 - Statement of Objectives, Policies and Methods, and Volume 3 - Statement of Rules. The City Plan was publicly notified on 24 June 1995 and made operative on 21 November 2005.

The Selwyn District Plan is also a document prepared under the Resource Management Act 1991 with the purpose to provide a framework for managing the effects of land use and subdivision within the District. The District Plan consists of three volumes: Townships, Rural, and Maps. The District Plan was publicly notified on 2 November 2000 and made partially operative on 10 June 2008.

## 2.2.5 PLANS AND NON-STATUTORY STRATEGIES

There are a number of relevant local government and non-governmental organisations (NGOs) strategies and plans in the zone that are relevant to the implementation of the CWMS and the ZIP. The Committee intends to include a list of the most relevant strategies and plans in the finalised ZIP. To illustrate, some relevant non-statutory plans would include (not an exhaustive list):

- Ngāi Tahu Freshwater Policy Statement
- Christchurch City Council's Surface Water Strategy 2009 – 2039
- Christchurch City Council's Water Supply Strategy 2009 - 2039
- Christchurch City Council's Draft Wastewater Management Strategy

There are community groups that have well established and developed strategies and plans for the management of water. The Committee hopes that the ZIP will help to facilitate strong connections and support for these where activities will help to implement the CWMS.

WORKING DRAFT FOR COMMITTEE

### 3. KEY PRINCIPLES

#### 3.1 OVERVIEW

In developing the Zone Implementation Programme (ZIP), the Committee identified that there were some general principles to be considered when tackling many of the water management issues in the zone. These principles are applied throughout the ZIP and have been woven into the Priority Outcomes and Recommendations as part of an integrated approach to water management. The Key Principles (not in order of priority) are:

- Kaitiakitanga
- Better integration of plans and collaboration between agencies and groups
- Earthquake recovery programmes help to implement the CWMS in the Zone
- Local people are involved in improving water management
- The effects of improving flood management are beneficial to a spectrum of waterway values.

#### 3.2 KAITIAKITANGA

##### Whakapapa

Whakapapa is an integral part of Maori society. It is used both extra and intra-tribally to establish and maintain relationships between people, their speaking rights and leadership rights and their environment. These relationships determine access to resources and the philosophies for their use, and also the responsibilities of people to others.

Whakapapa and Turangawaewae (traditional land rights) establish a person's right to participate in tribal life, and constitutes a statement of identity, both genealogically and geographically.

As well as reciting their genealogical relationship with each other and with other tribal groups. Ngāi Tahu also recites the Whakapapa which links humankind to the atua (deities) and to the earth, to the waters, forests, animals and birds.

Like other Maori Tribes, Ngāi Tahu claim the same Whakapapa through Rakinui (sky father) and Papatuanuku (earth mother) and see themselves as connected to the other descendants of Raki and his wives. Whakapapa then, binds Ngāi Tahu to the mountains, forests, and waters, and the life supported by them. In this way, all things are considered to have mauri (life force) and to be living and to have a genealogical relationship with each other. People are therefore related to the natural world

As all living creatures are born from Papatuanuku and all return to her on their death, Maori consider that they belong to the land and vice versa.

##### Wakawaka

Hapū and Iwi rights to fishing areas were based on the same criteria as those to land and its resources. These rights were not general and open to all, any more than land was. This right to control water-based, and particularly sea-based resources is called mana-moana and incorporates all of those principles included in manawhenua.

To Ngāi Tūāhuriri, fish were of great cultural, social and economic significance. Their collection was a communal task involving cooperation at a community level and they were traded for the delicacies of other areas, for example, potted birds from inland groups.

As well as developing extensive knowledge about each species life cycle, Ngāi Tūāhuriri developed the technologies to store excess catches for long periods of time.

### Mauri

Life, health and vitality – Mauri is the traditional measure of physical, spiritual and emotional wellbeing of people and places. Healthy waterways, healthy kai, healthy people.

As Kaitiaki, particular issues of concern within the zone that Mana Whenua would like to see addressed are:

- Remediation of inappropriate mixing of waters
- Restoration of our waterways to enable culturally sustainable harvesting of our kai roto, kai awa and kai moana
- Discharges of raw sewage and contaminants to all waterways desist.
- Wāhi Tapu and Wāhi Taonga sites are recognized, respected and protected.

These concerns are primarily about ensuring healthy ecosystems for the community and future generations: and that the mauri of rivers, streams, springs, the groundwater, wetlands and lagoons are restored and protected. They recognise the need for sustainable regional economic development and believe this is fundamentally dependent on sustaining healthy waterways.

Mana Whenua goals for water management in the zone are:

- That the above four concerns are addresses with the utmost urgency.

### **3.3 BETTER INTEGRATION OF PLANS AND COLLABORATION BETWEEN AGENCIES AND GROUPS**

The Committee believes that implementing the CWMS in the zone requires better integration of plans and collaboration between agencies and groups in the way that water is managed. The CWMS established the importance of having an integrated approach to water management that delivers multiple benefits in combination. In the Christchurch West Melton Zone there are already a number of plans and strategies in place (or being developed) in addition to the ZIP. Furthermore, there are organisations already involved in water management, including Ngāi Tahu, statutory organisations, businesses, and community groups. Ensuring that all of these different groups, plans, and strategies are working together in a way that helps to implement the CWMS is a key principle of the ZIP. Successfully applying this principle means that:

- The way water is managed and used enhances cultural, social, economic, and environmental well-being in the zone
- There is a joined up and collaborative approach to managing water issues in the zone:
  - From mountains (source) to the sea / “Ki uta ki tai”
  - Across and between rural and urban areas
  - Across and between Central Government, Regional Council, Territorial Authorities and with Mana Whenua
  - Understanding where our zone receives water from, or transfers water to other zones
  - Involving local community groups in implementation

Earthquake Recovery Programmes may provide an unique opportunity to proactively rehabilitate and protect waterways sites of cultural significance<sup>1</sup> and be consistent with Ngāi Tahu values.

### **3.4 EARTHQUAKE RECOVERY PROGRAMMES HELP TO IMPLEMENT THE CANTERBURY WATER MANAGEMENT STRATEGY**

The Committee believe that it is important that earthquake recovery programmes help to implement the CWMS (where possible and appropriate). Successfully applying this principle means that:

- Opportunities created by the earthquakes to do things differently, are taken and;
- Efforts to tackle and address the water related impacts of earthquakes, are targeted in implementing the CWMS

In the context of implementing the CWMS, the Committee recognises that recovering from the earthquakes presents additional water related challenges and opportunities, whether as a direct effect of the earthquakes themselves, or as a consequence of the decisions taken, in recovering and rebuilding. Some of the water related earthquake impacts have already been addressed (e.g. restoring water supplies to homes) however other impacts may be longer term or permanent (e.g. bed level of the Avon-Heathcote Estuary / Ihutai). Earthquake recovery is inevitably a key component of integrated water management that will need to be considered in tackling the water management issues and the priority outcomes identified.

### **3.5 LOCAL PEOPLE ARE INVOLVED IN IMPROVING WATER MANAGEMENT**

The involvement of local communities in identifying the priorities for water management at a local (zone) level is fundamental to the Canterbury Water Management Strategy. The Committee believe that this is a very important principle for the successful implementation of the CWMS in the Christchurch West Melton Zone. The large urban area in the zone means that water management challenges have a different emphasis compared to more rural zones. Stormwater is a more significant water quality challenge in urban waterways, whilst rivers and streams provide access to green space and “blue corridors” that are important for quality of life in an urban environment. Whilst some people are closely involved and interested in water management (e.g. participants in water based sports), others have a less direct connection with individual waterways and a strong focus on home use of water. Successfully accommodating this spectrum of interests means that:

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<sup>1</sup> Sites of cultural significance include Ngāi Tahu and European cultural sites.

- Local people have a sense of ownership and pride in the way water is managed in the zone
- Local people are well informed about the steps that they can take as individuals to help improve the way we manage water
- Local community groups have opportunities to be involved in implementation of recommendations

### **3.6 THE EFFECTS OF IMPROVING FLOOD MANAGEMENT ARE BENEFICIAL TO A SPECTRUM OF WATERWAY VALUES**

The CWMS does not address flooding or the management of floods. As such, the provision of flood defences and stop banks are beyond the scope of the ZIP. The Committee recognises however that some activities related to flood management may impact our ability to implement the CWMS. For example, dredging silt from waterways to maintain their flood carrying capacity may adversely impact on native biodiversity at least temporarily. The committee acknowledges that providing appropriate standards of flood protection will be the main priority for flood management activities.

There are significant flood management defences and activities in the Zone along the Waimakariri River and in urban areas. The Committee believes that improving the effects of flood management activities on waterways is an important principle for the ZIP. Successfully applying this principle means that:

- Flood management strategies, plans, and activities (including urban and rural drainage systems) are aligned with the CWMS where possible, without compromising the overall level of flood protection provided.



## **4. PRIORITY ISSUES**

### **4.1 ENHANCING AND MANAGING WATERWAYS FOR RECREATION AND RELAXATION**

#### Background

Christchurch is known as the “Garden City” due to the quality and extent of the green spaces, which in part is linked to the European heritage of riverside parks and walkways that are valued and enjoyed by both residents and tourists. Perhaps generally less well known are the Wāhi Taonga and Wāhi Tapu that are important to Mana Whenua.

Recreation, relaxation and amenity opportunities in the waterways of this zone are of social, cultural and economic benefit. Recreation, relaxation and amenity can vary from active pursuits e.g kayaking, kite surfing or jetboating to more leisurely activities such as gathering mahinga kai, fishing, walking, or picnicing. Waterways provide “blue corridors” that are valued and enjoyed by people in the Christchurch West Melton Zone for the recreation, relaxation and amenity opportunities they provide. The Waimakariri River is one of the most heavily used waterways in New Zealand. In addition, the braided character of the river has intrinsic value. In the urban setting riverside parks and reserves, provide access to open landscapes, water scenes, wooded areas and the more natural world that are used by e.g. walkers, cyclists, and by people taking some time out for quiet contemplation. Recreation and relaxation in this context has both direct and indirect benefits to local people and those from outside the zone.

More people taking part in more activities will increase exercise levels, reduce stress, support local businesses, encourage the provision of better attractions for both local people and visitors, and help earthquake recovery. In some instances, the social and economic benefits will be more tangible and demonstrably connected to waterways (e.g. increased visitor numbers to an improved riverside park), whilst more indirect in others (e.g. a person feels happier because they walked beside the river at lunchtime).

Each of the major catchments in the zone offers a different range of recreation, relaxation and amenity opportunities. Inevitably, there are sometimes conflicts between the different ways that people want to use and enjoy the same space. For example, a jet boat is not conducive to quiet contemplation. As such, the Committee believes it is important to manage our waterway corridors to provide for multiple recreation, relaxation and amenity uses. We believe that this will be most effectively achieved by involving local groups in identifying priorities for improving recreational and relaxation opportunities with easy access, i.e. close to their communities.

The Committee believes increasing access to waterways is a priority if we are to enhance recreation, relaxation and amenity opportunities. More space beside the waterways means more space to provide for a variety of activities. In some instances, development has encroached on riparian strips and there may be opportunities to reinstate these as part of the post-earthquake rebuild. It is also important to encourage developers to go beyond the statutory minima for set-back provisions to help expand or enhance riparian strips. Connecting recreational opportunities along waterway corridors is also important in improving access and encouraging people to use riparian areas. The

Committee supports the concept of a large multiple-use park along the Avon/Ōtākaro River in a corridor from the central business district to the estuary.

The Committee also believes that culture and heritage education parks along waterways would improve recreation, relaxation and amenity opportunities by helping people to better understand the multi-values of their waterways. Interpretation stations are important components of an overall approach to making waterway corridors more accessible. In the same vein, ensuring that there are venues for events (e.g. meeting places, concerts) alongside waterways is an important element of designing waterway corridors that are used by a broad-cross section of the community.

In some locations, where space is available and it is appropriate, moving stop banks further away from the river to reinstate flood plains may help to increase the diversity of landscapes and associated scope for recreation, relaxation and amenity. Ensuring that there is a variety of wet areas is an important design feature as ponds, wetlands, streams, and rivers all provide different experiences.

Ensuring that water is clean and safe for contact is essential for enhancing water based recreation, relaxation and amenity opportunities. Contact water recreation standards are the benchmark. This topic is addressed by the Priority Outcomes and Recommendations related to the Priority Issue of “Improving surface water quality and safeguarding surface water flows.”

For some water based sports, enhancing opportunities includes identifying ways to upgrade existing facilities or provide new venues within the zone. This is particularly the case for white-water and flat-water sports in the zone. The committee recognises that larger scale venues would be costly, with limited locations to establish new waterways for these sports (e.g. new artificial lakes). Furthermore, modification of existing waterways would potentially conflict with other priorities (i.e. straightening or widening rivers would have impacts on biodiversity and change flow characteristics). As such the Committee believe that it is appropriate to investigate how enhanced facilities could be developed in the zone, taking into account the following points:

- Preference for new artificial lakes over modification of existing waterways
- Accessibility of potential locations to encourage participation by younger age groups
- Supporting a variety of different recreation, relaxation and amenity activities (e.g. kayaking, rowing, swimming, sailing)
- Providing multiple benefits for enhanced water management (e.g. native biodiversity and habitat areas, stormwater retention basins, flood management )

### Our Priority Outcomes

The Canterbury Water Management Strategy (CWMS) has set specific targets for recreation and amenity opportunities. These targets particularly focus on availability and/or quality of recreational opportunities in each zone, increasing angler numbers or catch rates, addressing environmental flows to meet recreational outcomes and, in areas used for water based recreation, improving water quality if appropriate guidelines are not already met. The water quality aspects of the recreational targets are addressed in our water quality recommendations. Our Committee has specifically highlighted relaxation and passive recreation to clarify that recreation is not limited to more energetic activities.

In order to address CWMS recreation and amenity targets, the Committee have identified priority outcomes that need to be achieved. These are:

- Waterway corridors provide for multiple recreation, relaxation and amenity uses.
- Riparian strips are created, reinstated or expanded (in length and breadth) to improve accessibility for, and encourage recreation, relaxation and amenity
- Wāhi Taonga and Wāhi Tapu are acknowledged
- The effects of flood management activities on water based recreation are reduced and eliminated where possible
- Earthquake Recovery Programmes help enhance and manage waterways for recreation, relaxation and amenity.

### Links to CWMS

The Committee believe that achieving our priority outcomes will directly contribute to the implementation of the following CWMS recreation and amenity opportunities Target areas:

- Maintaining the existing diversity and quality of water-based recreation sites, opportunities and experiences,
- A positive trend in the availability and/or quality of recreational opportunities in our zone,
- Restoring at least one major fresh water recreational opportunity in our zone that is not currently available in 2010.
- Improving water quality in river bathing sites so at least 80% of these sites are graded as suitable for contact recreation

The Committee also believe that achieving our priority outcomes will contribute to achieving CWMS targets in other sections of the CWMS such as:

- Ecosystem health/biodiversity, through riparian management to improve habitat quality alongside and within waterways,
- Kaitiakitanga through acknowledgement and better understanding of wāhi taonga and wāhi tapu as well as improved quality of mahinga kai through riparian management improvements,
- Indicators of regional and national economies through increased recreational and tourism opportunities.

### Our Recommendations

The Committee have identified the actions that we recommend are implemented to achieve our priority outcomes (see table below). The 'priority outcome' column signifies the subject of the recommendation and the 'Who' column suggests the most appropriate lead organisation(s) for

delivering the result. The Committee acknowledges that there may be individuals and agencies who will be involved but who are not listed.

Priority Outcomes	Ref. #	Recommendations	Who	Implement within
<b>RR1</b> <b>Waterway corridors provide for multiple recreation, relaxation and amenity uses.</b>	<b>1.1</b>	a) Implement a collaborative process at a catchment level to involve local community groups in identifying priorities for improving recreational and relaxation opportunities. b) Review and update statutory plans and enforcement activities to give effect to these priorities. c) Develop and progress a co-ordinated programme of actions that are integrated into a catchment plan.	CCC, ECan, SDC	3 yrs
	<b>1.2</b>	Complete collaborative processes between community groups and waterway users for the Waimakariri River, Brooklands Lagoon, and the Avon-Heathcote Estuary/Ihutai, as waterways with multiple uses that are sometimes in conflict (e.g. boating, fishing, significant native biodiversity).	CCC, ECan, Regional Committee	1.5 yrs
	<b>1.3</b>	Develop and progress a co-ordinated programme of actions to: a) Increase inter-connection and accessibility of relaxation and recreation opportunities in urban and rural waterway corridors b) Increase the number of safe, inviting areas for quiet contemplation c) Establish environmental, cultural and heritage parks, with appropriate signage, along waterways.	CCC, ECan, SDC	5 yrs
	<b>1.4</b>	Investigate a co-ordinated programme of actions to move flood banks further back from urban waterways to facilitate improved recreation, relaxation and amenity	CCC SDC	3 yrs
	<b>1.5</b>	In consultation with community groups develop a co-ordinated programme to establish a large multiple-use park along the Avon/Ōtākaro River in a corridor from the central business district to the estuary	To be identified	3 yrs
	<b>1.6</b>	(a) Investigate; (b) develop a co-ordinated programme to develop international standard flat-water and white-water courses, taking into account: <ul style="list-style-type: none"> <li>Potential for these facilities to benefit: <ul style="list-style-type: none"> <li>native biodiversity</li> <li>stormwater management</li> <li>flood management</li> <li>other recreation and relaxation activities</li> </ul> </li> <li>Preference for new artificial lakes over modification of existing waterways</li> <li>Accessibility of potential locations to encourage participation by younger age groups</li> </ul>	To be identified, local community groups	3 yrs
<b>RR2</b> <b>Riparian strips are created, reinstated or expanded (in length and breadth) to encourage recreation, relaxation and</b>	<b>2.1</b>	a) Review the effectiveness of current set-back provisions to ensure that opportunities are taken as part of earthquake recovery to encourage recreation, relaxation and amenity in riparian areas. b) Review and update statutory plans and enforcement activities where required	CCC, ECan, SDC	6 months
	<b>2.2</b>	Where land is redeveloped or sub-divided, work with developers and landowners to implement actions that create, enhance and/or expand riparian strips	CCC, ECan, SDC	Ongoing

<b>amenity</b>	<b>2.3</b>	Work with interested land owners, to improve access for recreation, including mahinga kai harvesting, relaxation and amenity.		
<b>RR3 Wāhi Taonga and Wāhi Tapu are acknowledged</b>	<b>3.1</b>	Work with Mana Whenua to develop and progress a co-ordinated programme of actions to raise awareness, understanding, and engender a sense of shared pride in Wāhi Taonga and Wāhi Tapu	CCC, ECan, Mana Whenua SDC	3 yrs
<b>RR4 The effects of flood management activities on water based recreation are reduced and eliminated where possible</b>	<b>4.1</b>	a) Review statutory plans and flood management programmes to ensure that flood management infrastructure and activities do not adversely impact on water based recreation b) Update where required	ECan	Within 1 year
<b>RR5 Earthquake Recovery Programmes help enhance and manage waterways for recreation, relaxation and amenity</b>	<b>5.1</b>	Work with CERA to identify opportunities for Earthquake Recovery Programmes to assist with the implementation of the following recommendations, where appropriate: RR1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 2.1, 2.2, 2.3, 3.1	CCC, ECan, SDC	6 months
	<b>5.2</b>	With reference to the Committee provide guidance and advice on the implementation of Earthquake Recovery Programmes in the context of the CWMS	CCC, ECan, SDC	Ongoing to 2016

## **4.2IMPROVING SURFACE WATER QUALITY AND SAFEGUARDING SURFACE WATER FLOWS**

### Background

Good quality surface water and adequate flows are essential for the protection of natural ecosystems and the health of those people gathering mahinga kai and using waterways for recreation. High levels of harmful bacteria or other water-borne illnesses can affect people using waterways for gathering mahinga kai or recreation, and may affect animals. Bacteria found in water bodies are largely derived from water fowl, sewage, stormwater or farm run-off.

“Ngāi Tahu considers that its relationships with the waters of its rohe have been eroded over the last 150 years. Evidence produced by Ngāi Tahu to the Waitangi Tribunal documented numerous examples of the waterways within the Ngāi Tahu rohe:

- That are now severely polluted by discharges &
- Where reworking of the hydrological regime of waterways has resulted in unnatural patterns of erosion, sedimentation, drying up of flows and damage to rich mahinga kai habitats on the riparian margins.

The degraded state of many of the waterways is confirmed by the State of the Environment Report (1997). These adverse effects impact on the health and wellbeing of the waterways and the ability of Ngāi Tahu to access the life sustaining resources of the waterways.”<sup>2</sup> Environment Canterbury’s State of the Environment Report (2009) for fresh water confirms that generally urban lowland streams are of poor water quality. However, there are some exceptions such as spring zones.

In this Zone, water is not generally abstracted from rivers and streams for human drinking water but it is taken from the lower Waimakariri for stock water schemes.

Each of the major catchments in the zone has a different combination of issues and opportunities related to surface water quality and flows. These issues and opportunities reflect the type and intensity of land-use in the catchment (i.e. urban or rural), land drainage systems, historical modification of naturally occurring waterways, and the various inputs into, and abstraction from waterways (e.g. stormwater input, agricultural abstraction). The ecosystem health, biodiversity, recreation, relaxation and amenity, cultural and heritage outcomes that local communities want for individual waterways will vary. The feasibility of achieving those outcomes and the resource implications for doing so will also vary between catchments. The Committee believes it is important to establish specific water quality limits at a catchment level that reflect these factors in an integrated and planned way. It is crucial that local communities are involved in the process of identifying water quality outcomes (and associated environmental flows and limits).

The Waimakairiri River is the only braided river in the zone and retains significant and diverse values as a consequence of current water quality and flows. The Committee believe that safeguarding these values in the way the river is managed is a very high priority. It is however important to recognise that the Waimakairiri River has been modified and constrained to its current channel by stop banks

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<sup>2</sup>Te Rūnanga o Ngāi Tahu Freshwater Policy Statement pg 5

and gravel extraction, to provide flood protection to Christchurch and surrounding areas. The committee believes that these flood management activities should, where possible, be undertaken in a way that benefits the Waimakariri's braided character and associated ecosystems.

Water quality in our urban waterways is degraded by storm-water run-off from our streets, car parks, drives, and buildings. Making sure that stormwater does not flood our streets and houses is obviously important. Management of storm-water can be improved to minimise or eliminate the discharge of polluted water through either reducing the amount of contamination and/or reducing the volume or rate at which water is discharged. For example:

- Buildings can be built or retrofitted so that rainwater can be collected and used for flushing toilets or watering the garden. Green roofs and rain gardens can absorb more water to later release slowly.
- Materials that increase levels of contaminants (e.g. copper cladding, CCA treated wood) in new or renovated buildings should be avoided.
- Hard standing areas like car parks and drives should be surfaced with materials (e.g. gravel, permeable concrete) that allow water to soak into the ground instead of running into drains.
- Street design should incorporate green areas or swales to absorb and hold storm-water.
- New developments and subdivisions should be required to minimise, detain or retain, stormwater in the most appropriate way.
- Riparian strips should be created, reinstated or widened to improve the buffering of stormwater before it enters a stream.
- Roads should be swept more frequently to reduce the build-up of pollutants and rubbish which would otherwise wash off into the drains and rivers.
- Councils should work with community groups and media to raise awareness and understanding of stormwater management, so that individuals minimise their personal impacts, including:
  - Picking up dog poop when walking dog(s) to prevent poop being washed into the river
  - Washing paint brushes on the grass rather than pouring paint water down the drain, which is connected to the local stream
  - Cleaning cars on a porous surface (e.g. lawn, loose brick) to prevent detergents washing into streams.

The Committee believe that the post-earthquake rebuild of Christchurch provides a unique opportunity to retrofit and redesign the storm-water infrastructure of our city. This should be showcased in the design and construction of the new central city. If excellent standards of storm-water management are achieved, this will be to the long term benefit of our waterways and future generations.

Our aspiration is that the discharge of waste water into our waterways never happens. The Committee recognise however that this may sometimes be necessary in emergency situations to protect human health, as was the case in the immediate aftermath of the recent earthquakes. Christchurch is built on swamp and marshlands. Cracks or breakages in the sewerage system allow shallow groundwater to infiltrate the pipes, especially during heavy rainfall, worsening overflows to waterways. The Committee recognise that this restricts the ability to eliminate the discharge of waste water in extreme weather conditions, but strongly feel that this should be the goal in

reasonably foreseeable circumstances. To this end, there is an opportunity to improve the performance and resilience of our waste-water systems as they are rebuilt.

The committee acknowledges the significant improvements that have been made in recent years to public waste-water infrastructure (e.g. stopping discharge to the Avon-Heathcote Estuary /Ihutai) and the management of storm-water at a catchment level. Surface water quality and flows however remain an issue that needs to be further addressed if the long term vision of the CWMS is to be achieved in this zone.

The Committee also think that it is important to address industrial discharge in the zone. Proactively working with industry and business will help them to exceed environmental standards specified in their consents, which will further benefit waterways.

Increasing surface flows and improving water quality is a fundamental issue in successfully implementing the CWMS in this zone. Unless the water in our waterways is of a suitable quality and flows at the appropriate rates when needed, kaitiakitanga cannot be demonstrated nor can the social, economic, and environmental aspirations of local communities be met.

Water quality and flows are important so that:

- Healthy ecosystems and biodiversity can be maintained for their intrinsic value and our shared enjoyment
- Agricultural production where surface water is used to grow crops or provide drinking water for livestock can be supported
- Coming into contact with the water in our streams and rivers, or gathering food from waterways will not result in illness
- The mauri of waterways is safeguarded.

There are a number of different benchmarks for what constitutes “good” water quality depending on the desired outcome(s):

- Drinking water attains excellent water quality by meeting the New Zealand Drinking water standards<sup>3</sup>
- Water that is used for contact recreation can be graded as very good<sup>4</sup>
- The toxicity of different levels of contaminants for plants and animals varies according the species and the conditions that they have adapted to
- Health of waterways will be recognised when mahinga kai species are harvestable
- Food safety for species gathered from waterways can be measured according to NZ food safety guidelines and recreation water quality guidelines<sup>5</sup>

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<sup>3</sup> <http://www.mfe.govt.nz/publications/water/nz-drinking-water-standards-00.html>

<sup>4</sup> <http://www.mfe.govt.nz/publications/water/microbiological-quality-jun03/html/part-two.html>

<sup>5</sup> <http://www.foodsmart.govt.nz/food-safety/hunting-collecting-fishing/> and

<http://www.foodsmart.govt.nz/food-safety/hunting-collecting-fishing/> and

<http://www.mfe.govt.nz/publications/water/microbiological-quality-jun03/html/part-two.html>



In our zone, the quality and flows in the upper reaches of our spring-fed waterways is closely related to the groundwater quality and water table levels. Groundwater and surface water are intimately connected. Surface water flows, depend upon the levels in aquifers which should be monitored at multiple locations and maintained according to an agreed management regime. . The flows required to maintain desired amenity and ecosystems values of a waterway (e.g. the number of braided channels in a braided river, or to maintain fish passage) should be established and used as a benchmark. All non-domestic water takes, whether groundwater or surface water should be monitored, reported and analysed for trends.

### Our Priority Outcomes

The Canterbury Water Management Strategy (CWMS) has set specific targets for improving surface water quality for river bathing sites and lakes and rivers used for contact recreation under the “recreation and amenity opportunities” targets. Water quality and flows are implicit in the “ecosystem health and biodiversity” targets that focus on habitat quality, ecosystem health and improvement of lowland stream ecosystems. “Kaitiakitanga” targets refer specifically to direct discharges of contaminants into water and to addressing non-point source pollution. The “natural character of braided rivers” targets encompass the importance of flows, flooding, bird habitat and other indigenous habitats. “Environmental limits” that include setting environmental flows for surface streams and rivers plus setting load limits for nutrients are also CWMS Targets. At this stage our committee has insufficient information to be able to make specific recommendations for the Environmental limits targets.

In order to improve surface water quality and safeguard surface water flows, the Committee have identified priority outcomes which are:

- Surface water quality and flows are improved
- Mahinga kai is safeguarded from declining water quality and flows
- The Waimakariri River is safeguarded from declining water quality and flows
- Stormwater impacts on surface water quality are reduced
- Riparian strips are created, reinstated or expanded, and enhanced to reduce stormwater pollution
- Waste water impacts on surface water quality are reduced
- Industrial impacts on surface water quality are reduced
- Earthquake Recovery Programmes help improve surface water quality and safeguard surface water flows

### Links to CWMS

We believe that achieving our priority outcomes will contribute to achieving the following CWMS targets:

- Correcting decline in freshwater species, habitat quality or ecosystems,
- Preventing further loss of ecosystem health in river mouths and coastal lagoons (hapua)
- Improving lowland stream ecosystems
- Maintaining the natural braided character of the lower Waimakariri River

- Kaitiakitanga targets are met for point source discharges, non-point source pollution, mahinga kai, customary uses, wāhi taonga, and Waimakariri river environmental flows.
- Water quality targets for river bathing sites and rivers used for contact recreation are achieved.
- Indicators of regional and national economies regarding the contribution water makes to the Canterbury economy through value added economic impact.

#### Our Recommendations

The Committee have identified the actions that we recommend be implemented to achieve our priority outcomes (see table below). The 'priority outcome' column signifies the subject of the recommendation and the 'Who' column suggests the most appropriate lead organisation(s) for delivering the outcomes. The Committee acknowledges that there may be individuals and agencies who will be involved but who are not listed.

Priority Outcomes	Ref. #	Recommendations	Who	Implement within
<b>SW1</b> <b>Surface water quality and flows are improved</b>	<b>1.1</b>	a) Support community groups to identify outcomes for each major surface water catchment b) Review and update statutory plans and enforcement activities to give effect to these outcomes c) Develop and advance a co-ordinated programme of actions that are integrated into a catchment plan for each catchment including: <ul style="list-style-type: none"> <li>• public communications and awareness raising</li> <li>• initiatives to involve students at schools and education institutions</li> </ul>	CCC, ECan, SDC	3-5 yrs
	<b>1.2</b>	a) Work with the Committee to agree a preferred approach for managing rural land-use in the zone b) Update the proposed Land and Water Regional Plan where required	ECan	3-5yrs
	<b>1.3</b>	Review the use and management of stock water races taking into account flows into naturally occurring waterways, and update as required	CCC SDC	Every 3 years
	<b>1.4</b>	Review and monitor effectiveness of the 'Pollution Hotline' service and update where required	ECan	Annually
	<b>1.5</b>	Develop and initiate a prioritised programme of projects to artificially rehabilitate flows in spring-fed waterways	CCC, ECan, Mana Whenua, SDC	3-5 yrs

	<b>1.6</b>	Work with the landowners to: a) Assess the impact of abandoned historical infrastructure (e.g. abandoned wells, dumps) b) Develop and progress projects to address significant issues as quickly as possible	CCC, ECan, SDC	Ongoing
<b>SW2a</b> <b>Mahinga Kai are safeguarded from declining water quality and flows</b>	<b>2.1</b>	a) Review Plans and Strategies to assess the effectiveness of provisions to safeguard mahinga kai values in all waterways, taking into account: a. water quality b. flows c. habitat for all life stages of mahinga kai <sup>6</sup> b) Update the Plans and Strategies where required		
<b>SW2b</b> <b>The Waimakariri River is safeguarded from declining water quality and flows</b>	<b>2.2</b>	a) Review the effectiveness of the Waimakariri River Regional Plan, taking into account: o water quality o flows o braided river character o gravel extraction o flood management o endangered birds b) Update the plan where required	ECan	3-5 yrs
<b>SW3</b> <b>Stormwater impacts on surface water quality are reduced</b>	<b>3.1</b>	a) Review statutory plans and enforcement activities to ensure that : • Stormwater infrastructure is upgraded or retrofitted where possible when building density is changed • Stormwater from all new developments and subdivisions is treated at/or near to source and not discharged directly into waterways b) Update where required	CCC, ECan, SDC	6 months
	<b>3.2</b>	a) Review planned improvements to public stormwater infrastructure, taking into account: • Opportunities to speed up implementation • Minimising the direct discharge of stormwater to waterways (eliminating where possible) as quickly as possible b) Update where required and progress	CCC, ECan, SDC	Annually
	<b>3.3</b>	Identify and implement performance standards for the permeability of new and resurfaced car-parks/footpaths/drives to reduce run-off rates	CCC, SDC	6 months
	<b>3.4</b>	Identify and implement performance standards for the design of new or redeveloped buildings, taking into account: • Best practice treatment at/or near source • Avoiding materials that increase levels of contaminants (e.g. copper cladding)	CCC, SDC	6 months
	<b>3.5</b>	Develop and progress a programme of actions to ensure that new and retrofitted infrastructure in the new central city meets international best practice standards, with a view to Christchurch becoming an international exemplar of excellent urban stormwater management	To be identified	6 months
	<b>3.6</b>	Review and update road sweeping operations to reduce contamination from polluted stormwater.	CCC, SDC	2 yrs

<sup>6</sup> All species utilised by people for food &/or other purposes need habitats for each of their life stages to be protected, if they are to thrive.

	<b>3.7</b>	Publicise and enforce existing sediment control and erosion regulations from new subdivisions	CCC, ECan, SDC	Ongoing
<b>SW4</b> Riparian strips are created, reinstated or expanded, and enhanced to reduce stormwater pollution	<b>4.1</b>	a) Review the effectiveness of current set-back provisions to ensure that opportunities are taken as part of earthquake recovery b) Update statutory plans and enforcement activities where required	CCC, ECan, SDC	6 months
	<b>4.2</b>	Where land is redeveloped or sub-divided, work with developers and landowners to further enhance and/or expand riparian strips	CCC, ECan, SDC	Ongoing
<b>SW5</b> Waste water impacts on surface water quality are reduced	<b>5.1</b>	Review and update public waste water strategies and plans to ensure that : <ul style="list-style-type: none"> <li>there is no direct discharge to waterways in non-emergency situations (in as far as this is possible)</li> <li>infrastructure is more resilient to natural hazards</li> </ul>	CCC, SDC	3 yrs
	<b>5.2</b>	a) Review the standards for private waste water treatment systems in the Groundwater Protection Zone, taking into account the risk of contamination in emergency situations b) Update where required	ECan	3 yrs
<b>SW6</b> Industrial impacts on surface water quality are reduced	<b>6.1</b>	Work with the industry to develop and progress projects to phase out direct discharge to waterways as quickly as possible	CCC, ECan, SDC	Ongoing
	<b>6.2</b>	Prohibit new industrial discharges direct to waterways in the Proposed Land and Water Regional Plan	ECan	1 yr
	<b>6.3</b>	Develop and advance an enhanced programme of co-ordinated initiatives to encourage industry to go beyond the minimum required for compliance, prioritising areas with poor water quality	CCC, ECan, SDC	1 yr
<b>SW7</b> Earthquake Recovery Programmes help improve surface water quality and safeguard surface water flows	<b>7.1</b>	Work with CERA to identify opportunities for Earthquake Recovery Programmes to assist with the implementation of the following recommendations, where appropriate: SW1.1, 1.5, 1.6, 2.1, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 5.1, 5.2	CCC, ECan, SDC	6 months
	<b>7.2</b>	The Zone Committee to provide guidance and advice on the implementation of Earthquake Recovery Programmes in the context of the CWMS	CCC, ECan, SDC	Ongoing to 2016

### **4.3 ENHANCING HEALTHY ECOSYSTEMS, NATIVE BIODIVERSITY, AND VALUED INTRODUCED SPECIES AND LANDSCAPES**

#### Background

The waterways in our zone have been significantly modified since European settlement of Christchurch in the 1800's. The extensive network of swamps, marshes, and wetlands have been drained and built upon as Christchurch City expanded. The streams and rivers have been modified through:

- Constraining by stop banks
- Deepening and/or widening
- Introduction of new barriers (e.g. culverts, weirs)
- Changes in land-use (both rural and urban) reducing water quality
- Changed flow patterns
- Replacing indigenous riparian vegetation with non-native species
- Creating European style landscapes (e.g. parklands, pastureland)

These changes have profoundly altered the nature of the ecosystems and species in our zone, with the loss of wāhi tāonga and mahinga kai. Realistically, we need to recognise that waterway ecosystem restoration is not possible and aim for rehabilitation to the maximum extent practicable.

The Committee believe that we must protect and increase native biodiversity in our zone. There has been a general decline in the health and abundance of native ecosystems and biodiversity especially since European settlement. For example, more than 90% of wetlands in the zone have been lost. In some places, spring-fed waterways have dried up or disappeared in their higher reaches as the water table has been affected by abstraction and land use changes. Many native species have been lost from our waterways as a consequence of declining water quality, changed river morphology, and competition from non-native species. Some of the change has been recent. For example the Giant Banded Kokopu were found in the River Avon / Ōtākaro until [insert text]. On the flip side, there are still small high quality native habitats and biodiversity that are worth protecting. For example, Travis Wetland is a natural wetland being rehabilitated; there is a population of blue gilled bully's at Horseshoe Lake, and inanga spawning habitats on the tidal reaches of all the urban rivers.

The Committee has not located all the natural wetlands in our zone. It is important to identify these wetlands so that they are protected for their intrinsic and biodiversity values. In addition, many of these wetlands provide a natural environmental service by removing nutrients and sediment and providing storage to reduce flooding. While the Committee does not advocate for naturally occurring wetlands to be managed solely for these extra benefits, we think these additional benefits increase the importance of wetlands. Similarly, wetlands that are specifically constructed for these latter purposes should be designed to enhance biodiversity and other values wherever possible (e.g. native plantings, amenity & recreation).

Some non-native species and landscapes related to waterways are valued by local communities. For example, salmon and trout are valued as game fish by anglers and make good eating. Specimen trees in parks are key features of the landscapes, valued by many people as part of our European heritage. It is important that these valued introduced species and landscapes are safeguarded were appropriate as part of a healthy ecosystem. The Committee however acknowledge that in some circumstances, introduced species are "pests" which affect our ability to protect and enhance native

biodiversity. For example, removing barriers to fish migration may help the populations of migratory native fish species, but also increase predation of native fish by introduced species.

Our definition of a pest species is an animal, bird, fish, plant or organism which causes damage to indigenous ecosystems, or that predate on, or competes with, native species. In some situations, we may wish to manage our waterways to support non-native species that are valued by people. For example, salmon and trout predate on native fish species, but are valued as a game fish. For this reason, we believe that it is important to identify what constitutes a pest species at a local level (i.e. individual waterways or catchments) in pest management plans. This approach will ensure that pest management activities are targeted to managing the species that conflict with the desired biodiversity outcomes for a particular waterway.

Pest management has the potential to become a significant issue in red zone land if pest populations are uncontrolled where people move out. The Committee believe that a co-ordinated approach is required in these areas to avoid significant negative impacts on the native biodiversity and valued species in our waterway corridors.

The Waimakariri River is unique in the zone for its braided river ecosystem and the native species that it supports. The Committee is keen to ensure that the important native biodiversity (e.g. native fish species, braided river birds) and valued introduced species (i.e. salmon and trout) are protected by enhancing the health of the whole ecosystem. Similarly, the Avon-Heathcote Estuary / Ihutai has highly significant native biodiversity and valued introduced species that the Committee believe need to be appropriately protected.

The extensive flood management activities in our zone have the potential to impact adversely on native biodiversity and valued introduced species. Dredging, weed cutting, gravel extraction etc. need to be undertaken in a way that is sensitive to the organisms of our waterway corridors where ever possible. Flood protection activities need to be reviewed regularly and continuously improved. Where ecosystem damage by such activities is unavoidable remediation should be the norm.

The Committee think that enhancing waterway corridors by reinstating, rehabilitating, or expanding riparian strips is a priority outcome and making more space for a greater variety of habitats will provide greater scope for this.

There were extensive dryland ecosystems on the Canterbury Plains prior to the intensification of agriculture. In this zone, fragments of native dryland ecosystems remain. The Committee believe that these need to be protected from further loss or degradation, and opportunities to improve the overall health of this ecosystem taken.

Each of the major catchments in the zone will have different issues and opportunities related to enhancing ecosystem health, native biodiversity, valued introduced species and landscapes. Managing these sometimes competing priorities will be most effectively achieved by involving local community groups, ideally at a catchment level, in conjunction with providing suitable water quality and flows, and providing for recreation, relaxation and amenity.

#### Our Priority Outcomes

The Canterbury Water Management Strategy (CWMS) has set a number of targets for ecosystem health and biodiversity. These targets concern freshwater species, Habitat quality and ecosystems, in

general. There are also targets focused on particular ecosystem types and on native fish, trout and salmon. Not all ecosystem types are found in our zone. The Committee also acknowledge that there are introduced plant and animal species that are valued by the community, associated with our waterways. We have recognised the importance of valued introduced species in our recommendations.

In order to address ecosystem health and biodiversity targets, the Committee have identified priority outcomes to be achieved.

They are: (Not in order of priority)

- Ecological health of all waterways is protected and rehabilitated
- Naturally occurring wetlands are identified and rehabilitated
- Effects of flood management activities on waterway biodiversity are reduced
- Riparian strips are created, expanded and/or enhanced
- Mahinga kai is enhanced
- Indigenous species diversity and abundance is increased The impact of pest species on waterways is reduced
- Dryland ecosystems are protected and rehabilitated
- The Avon-Heathcote Estuary/Ihutai ecosystem is more effectively protected
- In the medium term earthquake recovery programmes help enhance healthy ecosystems, native biodiversity and valued introduced species

#### Links to CWMS

The Committee believe that achieving our priority outcomes will directly contribute to the implementation of the following CWMS Targets:

- Ecosystem health and biodiversity (Freshwater species, habitat quality, ecosystems; river mouth & coastal lagoons; dryland ecosystems; lowland streams; spring-fed streams; General including wetlands & riparian management; and native fish targets)

The Committee also believe that achieving our priority outcomes will contribute to achieving CWMS targets in other sections of the CWMS, such as:

- Natural character of braided rivers (braided river birds, indigenous habitat)
- Kaitiakitanga (wāhi tāonga, mahinga kai, customary uses)
- Recreation and amenity opportunities (improved catch rates for anglers)
- Indicators of regional and national economies (Increased wealth due to biodiversity protection and improvement)

#### Our Recommendations

The Committee have identified the actions that we recommend be implemented to achieve our priority outcomes (see table below). The 'priority outcome' column signifies the subject of the recommendation and the 'Who' column suggests the most appropriate lead organisation(s) for delivering on the recommendation. The Committee acknowledges that there may be individuals and agencies who will be involved but who are not listed.

Priority Outcomes	Ref. #	Recommendations	Who	Implement within
<b>EB1</b> Ecological health of all waterways is protected and rehabilitated	<b>1.1</b>	a) Ensure statutory plans and enforcement activities: <ul style="list-style-type: none"> <li>• Appropriately manage human activities which negatively impact on the ecological health of waterways</li> <li>• Protect/rehabilitate all naturally occurring wetlands</li> <li>• Avoid or mitigate barriers to the movement of native stream fauna</li> <li>• Safeguard braided river bird habitats on the Waimakariri River from human activities</li> </ul> b)	CCC, DoC, ECan, SDC	2 yrs
	<b>1.2</b>	Develop a co-ordinated programme of actions to improve the ecological health of waterways and ensure that it is integrated into a plan for each major surface water catchment	CCC, DoC, ECan, Mana Whenua, SDC	3yrs
	<b>1.3</b>	Continue to remove earthquake silt from waterways as planned	CCC	Ongoing
	<b>1.4</b>	a) Continue existing public communications and education initiatives to improve understanding of the many values of our waterways. b) Develop and advance a co-ordinated programme of initiatives to engender a greater understanding of the value of set-back provisions, native biodiversity and introduced species.	CCC, ECan, SDC	3-5 yrs
<b>EB2</b> Naturally occurring wetlands are identified and rehabilitated	<b>2.1</b>	Identify all naturally occurring wetlands	CCC, DoC, ECan, SDC	3yrs
	<b>2.2</b>	Develop and implement a management plan for two significant wetlands, so that they are rehabilitated by 2015	CCC, DoC, ECan, Mana Whenua, SDC, ZC	3 yrs
<b>EB3</b> Effects of flood management activities on waterway biodiversity are minimised	<b>3.1</b>	a) Continuously improve work programmes and operations to: <ul style="list-style-type: none"> <li>• Minimise the direct impacts of flood management operations on biodiversity</li> <li>• Rehabilitate waterways after modification to increase the diversity of in-stream habitats.</li> </ul>	CCC, ECan, SDC	Every 3 years
	<b>3.2</b>	Ensure the Canterbury Regional River Gravel Management Strategy is implemented to provide protection for the diversity and abundance of indigenous and valued introduced species	ECan	1 yr



<b>EB4</b> <b>Riparian strips are created, expanded and/or enhanced</b>	<b>4.1</b>	Review the effectiveness of current set-back provisions to ensure that opportunities are taken as part of earthquake recovery to enhance waterway biodiversity and amenity.  [This recommendations correlates with RR2.1(b)]	CCC, ECan, SDC	6 months
	<b>4.2</b>	Where land is redeveloped or sub-divided, work with developers and landowners to implement actions to create or further enhance and/or expand riparian strips	CCC, ECan, SDC	Ongoing
<b>EB5</b> <b>Mahinga kai is enhanced</b>	<b>5.1</b>	Working with interested land owners, identify where good sources of mahinga kai could be readily rehabilitated and accessed	CCC, DoC, ECan, Mana Whenua, SDC	1 yr
	<b>5.2</b>	Identify and initiate the implementation of management plans to rehabilitate mahinga kai (e.g. contribute staff time/project funding)	CCC, DoC, ECan, SDC	3 yrs
<b>EB6</b> <b>Indigenous species diversity and abundance is increased</b>	<b>6.1</b>	Immediate Steps funding is allocated to projects in the following priority areas and ecosystems: <ul style="list-style-type: none"> <li>• Springheads of spring fed waterways</li> <li>• Wetlands</li> <li>• Waimakariri River mouth</li> <li>• Brooklands Lagoon</li> <li>• Avon-Heathcote Estuary /Ihutai<sup>7</sup></li> <li>• Other projects that score highly on cultural and ecological assessment</li> <li>• As a first preference, support projects that are led by or involve community groups</li> </ul>	ECan, ZC	Commencing Immediately
	<b>6.2</b>	a) Identify and assess the impact of barriers that restrict the movement of native in-stream and stream associated fauna for all waterways b) Except for barriers that protect native fish from introduced fish species, prioritise and progress a programme of work to remove barriers identified,	CCC, DoC ECan, Mana Whenua, SD	3-5 yrs
<b>EB7</b> <b>The impact of pest species<sup>8</sup> on waterways is reduced</b>	<b>7.1</b>	Implement a pest management plan for the residential red zone.	To be identified	6 months
	<b>7.2</b>	Develop and implement a co-ordinated pest control programme for all waterways in the zone	CCC, DoC, ECan, Mana Whenua, SDC	3-5 yrs

<sup>7</sup> This includes species that move between salt and freshwater environments and the up-stream habitat areas that are important in their lifecycle

<b>EB8</b> <b>Dryland ecosystems are protected and rehabilitated</b>	<b>8.1</b>	a) Assess the effectiveness of current statutory plans and enforcement activities in protecting remnant dryland ecosystems from changes of land use and/or new irrigation b) Update plans where required	CCC, DoC, ECan, SDC	3yrs
	<b>8.2</b>	Develop and progress a co-ordinated programme of actions as part of an integrated management approach to: <ul style="list-style-type: none"> <li>Identify all remnant dryland ecosystems</li> <li>Improve the ecological health of drylands and;</li> <li>Increase the total area of dryland ecosystems</li> </ul>	CCC, DoC, ECan, Mana Whenua, SDC	5 yrs
	<b>8.3</b>	Work with landowners to develop and progress management plans to improve dryland ecosystems	CCC, DoC, ECan, SDC	3yrs
<b>EB9</b> <b>The Avon-Heathcote Estuary/Ihutai ecosystems are more effectively protected</b>	<b>9.1</b>	Review the effectiveness of the current statutory and non-statutory protection measures for native biodiversity and valued introduced species	CCC, Local communit y Groups DoC, ECan, Mana Whenua	3yrs
	<b>9.2</b>	Agree and implement a package of protection measures	CCC ECan DoC Mana Whenua local communit y groups	3 - 5 yrs
<b>EB10</b> <b>Earthquake Recovery Programmes help enhance healthy ecosystems, native biodiversity and valued introduced species</b>	<b>10.1</b>	Work with CERA to identify opportunities for Earthquake Recovery Programmes to assist with the implementation of the following recommendations, where appropriate:  EB1.1, 1.2, 1.3, 4.1, 4.2, 7.1, 8.1	CCC, ECan, SDC	6 months
	<b>10.2</b>	With reference to the Committee provide guidance and advice on the implementation of Earthquake Recovery Programmes in the context of the CWMS	CCC, ECan, SDC	Ongoing to 2016

## **4.4 SAFEGUARDING GROUNDWATER QUALITY AND FLOWS FOR MULTIPLE USES**

### Background

In the Christchurch West Melton Zone, groundwater underpins the cultural, social, economic, environmental well-being and health of local communities:

- Our major urban streams and rivers are all spring-fed by groundwater, which is linked to the ecosystem health of surface waterways and associated cultural values
- Our untreated potable drinking water supply comes from the aquifers (public community supplies and private takes)
- Industry in our zone has an economic advantage because of the ready availability of groundwater of suitable quality and quantity
- Groundwater is abstracted to support agricultural production, including market gardening that supplies fresh produce to shops in Christchurch
- The high pressure of water in the aquifers minimises the cost of pumping water around the zone

The Committee notes that abstraction of groundwater for human use reduces the amount of water in the system that is available for the environment. This means that we will have to accept that supplying water for the needs of our society will inevitably impact on the environment. This is why the Committee believes it is important to review the future water needs of our communities in the context of meeting water demands from the aquifers. This will enable us to make informed decisions about the consequences of our demands and to identify the best integrated approach for the future management of water.

The management of groundwater is further complicated as the aquifers we rely upon are part of a wider system under the Canterbury Plains. This means that we both receive groundwater from, and export groundwater to other zones. In order to realise our aspirations about groundwater, we will need to work with other Zone Committees in adjacent areas.

The Committee recognises that maintaining an untreated potable water supply in our zone is a fundamental expectation of local people. In our zone, we strongly support the on-going enforcement of “Groundwater Protection Zones” and the restrictive management of land-use activities over unconfined aquifers where the risk of groundwater contamination is greatest. The Committee also note the significant work that has been done in recent years to conclude that there is no/or little risk posed to water quality in our aquifers by new irrigation schemes and land-use intensification outside of our zone (i.e. Central Plains Water). This is the basis of the current planning approach being taken by Environment Canterbury in the Proposed Land and Water Regional Plan and the development of sub-regional chapters.

The Committee acknowledges that for many people in our zone, there is an on-going anxiety about the risk that land-use intensification poses to the water quality in our aquifers. As such, we believe that the CWMS process necessitates a general review of the currently available information by a panel of experts to jointly advise on:

- The spatial extent of groundwater flows and recharge areas that feed water into the zone, and;
- The degree of risk posed by current land use, and likely scenarios of future land use, over unconfined aquifers

- A long term research programme to gain a better understanding of the three-dimensional nature of the Zone aquifers and the movement of groundwater through them.

In the context of implementing the CWMS in our zone, this approach will provide reassurance for the Committee (and wider public) that groundwater quality is being safeguarded and flows in the most effective way for the future. Once a joint position is agreed, statutory plans and enforcement activities (including Groundwater Protection Areas) can be amended if necessary.

The Committee has heard that the rate at which water seeps from the Waimakariri River into the aquifers in our zone is considered to be relatively consistent. The committee is however concerned that any deterioration in water quality in the Waimakariri River could introduce additional contamination into the aquifers. We believe a precautionary approach to managing water quality in the Waimakariri should be adopted.

In addition, the groundwater systems in the zone support populations of invertebrates that are endemic to New Zealand (possibly to Canterbury). The role of groundwater invertebrates in maintaining water quality in the aquifers, or their sensitivity to pollution, is not yet fully understood. The Committee think that avoiding significant changes to groundwater quality and quantity would seem prudent until the invertebrate ecology is better understood, as a precautionary approach to maintaining water quality in our aquifers.

The Committee is particularly concerned about activities in the zone that could potentially affect water quality or flows in the vicinity of springs that feed our waterways. This is because structures that penetrate into the water table (pumped wells or drained pits) have the potential to divert groundwater flows away from springs and reduce stream flows. In addition, some activities have the potential to degrade water quality by introducing new contamination (e.g. CCA timber) or to disturb sediments. The Committee are keen to ensure that all of these impacts are closely controlled as part of the post-earthquake rebuild, and in general to safeguard the future of spring-heads.

There have been two obvious groundwater related impacts resulting from the earthquakes: liquefaction and new springs. The Committee acknowledges the effects of these impacts on people in the zone however, considers that they are outside the scope of the ZIP as follows:

- Other than where silt has impacted directly on waterways, the committee considers the effects of liquefaction to be outside of the scope of the CWMS.
- Where new springs arise outside of existing water corridors and/or are affecting buildings or private land, the committee considers that these springs are best addressed in the context of earthquake recovery.

It is important to note that the reticulated public water supply in the Lyttelton Harbour / Whakaraupo area of the Banks Peninsula Zone is supplied from groundwater that is abstracted in the Heathcote Valley, part of the Christchurch West Melton Zone. This Committee will work with the Banks Peninsula Zone Committee to ensure appropriate alignment of CWMS implementation on this matter.

#### Our Priority Outcomes

The Canterbury Water Management Strategy (CWMS) has set a number of Targets that are relevant to groundwater management. Of particular significance are the targets concerning “Drinking Water” as most drinking water in the Christchurch West Melton zone is sourced from groundwater. “Water-use efficiency” targets are also relevant for groundwater management. In this Zone water takes for urban parks and sports-field irrigation are sourced from groundwater, as are takes for

industrial/commercial and community use. “Indicators of regional and national economies” are also relevant because of the value of access to an untreated water supply for both commercial and domestic use. Lower Waimakariri limits for environmental flows are relevant because of the contribution that groundwater makes to rivers and streams flows, especially during summer. Catchment load limits for nutrients are also relevant to groundwater because of the contribution that groundwater makes to stream flows and, in particular because of the risks of nitrate contamination in drinking water supplies.

The Committee therefore believe that safeguarding groundwater quality and flows for multiple uses is possibly the most important issue to be tackled to successfully implement the CWMS in the Christchurch West Melton Zone. In order to address this issue, the Committee have identified priority outcomes.

These are (in no particular order):

- Groundwater quality is safeguarded for multiple uses
- The quality of untreated drinking water from aquifers is safeguarded
- Groundwater resources are actively managed for multiple uses
- Water levels, quality and flows at spring-heads of spring-fed waterways are safeguarded
- Earthquake Recovery Programmes help safeguard groundwater quality and flows for multiple uses

#### Links to CWMS

The Committee believe that achieving our priority outcomes will contribute directly to the implementation of the following CWMS Targets:

- General contaminant risks and nitrate loads in relation to drinking water targets:
- Indicators of regional and national economies

The Committee also believe that achieving our priority outcomes will contribute to achieving CWMS targets in other sections of the CWMS such as:

- Ecosystem health and biodiversity for riparian and in-stream ecosystems especially at the spring heads.
- Achieving kaitiakitanga (instream flows, non-point source pollution, drinking water quality, wāhi taonga & mahinga kai)
- Improving water use efficiency (irrigation, community use, industrial/commercial use)
- Establishing environmental limits

Our Recommendations

The Committee have identified the actions that we recommend be implemented to achieve our priority outcomes (see table below). The 'priority outcome' column signifies the subject of the recommendation and the 'Who' column suggests the most appropriate lead organisation(s) for delivering on the recommendation. The Committee acknowledges that there may be individuals and agencies who will be involved but who are not listed.

Priority outcomes	Ref. #	Recommendations	Who	Implement within
<b>GW1</b> Groundwater quality is safeguarded for multiple uses	<b>1.1</b>	a) Review the effectiveness of statutory plans and enforcement activities to: <ul style="list-style-type: none"> <li>• Manage land-use activities over un-confined aquifers on a precautionary basis</li> <li>• Maintain special provisions in relation to the Groundwater Protection Zones</li> <li>• Prevent new development and/or intensification/change of land use in the Groundwater Protection Zones if it cannot be undertaken without poses significant risk of reducing groundwater quality</li> <li>• Ensure that private bore casings are installed to appropriate standards to protect ground water quality</li> </ul> b) Update plans where required	CCC, ECan, SDC	1 .5yrs
	<b>1.2</b>	Continue to implement a co-ordinated groundwater quality monitoring programme to keep nitrate levels and other contaminants under surveillance against World Health Standards	CCC, CDHB, ECan, SDC	Ongoing
<b>GW2</b> The quality of untreated drinking water from aquifers is safeguarded	<b>2.1</b>	a) Establish and facilitate an expert panel to review and jointly advise on the following points (using currently available information): <ul style="list-style-type: none"> <li>• The spatial extent of groundwater flows and recharge areas that feed water into the zone, and;</li> <li>• The degree of risk posed by current land use, and likely scenarios of future land use, over un-confined aquifers</li> </ul> b) Where required, update statutory plans and enforcement activities	CCC, CDHB, ECan, SDC	6 months
	<b>2.2</b>	Develop and initiate a programme of actions to improve the security of drinking water supplied via the public reticulation system in north west Christchurch (to at least a Ba NZ Drinking Water Standards)	CCC,	2 yrs
	<b>2.3</b>	<i>Insert recommendation on SDC public community water supply</i>		
<b>GW3</b> Groundwater resources are actively managed for multiple uses	<b>3.1</b>	Update future demand projections for the community water supply, to ensure alignment with the following: <ul style="list-style-type: none"> <li>• Earthquake Recovery Strategy</li> <li>• Greater Christchurch Urban Development Strategy</li> <li>• Christchurch West Melton Zone Implementation Programme</li> </ul>	CCC, ECan	2 yrs
	<b>3.2</b>	Develop future demand projections for all other takes from groundwater, to ensure alignment with the following: <ul style="list-style-type: none"> <li>• Earthquake Recovery Strategy</li> <li>• Greater Christchurch Urban Development Strategy</li> <li>• The Zone Implementation Programme</li> </ul>	ECan	2 yrs

	<b>3.3</b>	<p>a) Assess the extent to which the management of groundwater resources can give effect to the following outcomes in combination (not in order of priority):</p> <ul style="list-style-type: none"> <li>• Maintain and enhance flows at springheads of spring-fed waterways to sustain ecosystem health and cultural values, and;</li> <li>• Where possible reinstate flows from historical springs and;</li> <li>• Safeguard recharge and water quality of the deeper aquifers so that the resource is not depleted or degraded in quality and;</li> <li>• Meet projected future demand for community water supply and;</li> <li>• Meet projected demand of all other takes and;</li> <li>• Remain resilient in reasonably foreseeable climate variation scenarios</li> </ul> <p>b) Work with the Committee to identify a preferred approach to managing and allocating groundwater resources</p> <p>c) Where required, update the Land and Water Regional Plan to give effect to the preferred approach</p>	CCC, ECan, SDC	3 yrs
<b>GW4</b> Water levels, quality and flows at spring-heads of spring-fed waterways are safeguarded	<b>4.1</b>	<p>a) Identify “sensitive” areas around the heads of spring fed waterways where activities could alter or vary groundwater quality, levels, and flows (this may require a detailed survey of springs)</p> <p>b) Review the effectiveness of statutory plans and enforcement activities taking into account:</p> <ul style="list-style-type: none"> <li>• A precautionary approach in sensitive areas</li> <li>• The design and construction of foundations for new and redeveloped buildings</li> <li>• Design and installation of new and replacement buried infrastructure (e.g. pipes, cables)</li> </ul> <p>c) Update plans where required</p>	CCC, ECan, SDC	6 months
	<b>4.2</b>	<p>a) Identify shallow groundwater takes in sensitive areas that are having a negative impact on spring-fed waterways</p> <p>b) Working with consent holders, develop and implement a co-ordinated programme of actions to retire or modify takes which are identified as causing harm to ecosystems.</p>	ECan, CONSENT HOLDERS	5 yrs
<b>GW5</b> Earthquake Recovery Programmes help safeguard groundwater quality and flows for multiple uses	<b>5.1</b>	Work with CERA to identify opportunities for Earthquake Recovery Programmes to assist with the implementation of the following recommendations, where appropriate: GW1.1, 2.1, 3.1, 3.2, 3.3, 4.1	CCC, ECan, SDC	6 months
	<b>5.2</b>	With reference to t The Committee provide guidance and advice on the implementation of Earthquake Recovery Programmes in the context of the CWMS	CCC, ECan, SDC	Ongoing to 2016

## **4.5 MAKING EFFICIENT USE OF WATER AND MANAGING DEMAND**

### Background

In the Christchurch West Melton Zone, we are very fortunate to have large aquifers (essentially natural reservoirs under the ground) containing vast amounts of good quality water for people to use. Whilst the total volume of groundwater is large, the rate at which water is replaced (or recharged) into the aquifers is dependent on 2 key factors; how much rain falls on the plains to the west of the city and; how much water flows out of the Waimakariri River into the ground.

The Committee is concerned that if water is taken from the aquifers at a rate which is faster than they are recharged, our underground reservoirs will be depleted. Over time, there may be less water available in the aquifers for us to use. In addition, possible variations in climate may affect the amount and timing of rainfall on the plains or flows in the Waimakariri River. In turn this may affect the availability of water in the aquifers.

The total amount of water taken by people from the aquifers in the zone has increased over time. The aquifers providing for domestic, commercial, and industrial use also feed springs which create the urban rivers (e.g. Avon/Ōtākaro River) so valued by local communities. Taking water for people to drink, water gardens, flush toilets, clean cars, irrigate crops, and manufacture products, means that there is already less available for the environment.

The Committee believes that it is important to plan today for multiple uses and benefits. Everybody using water whether in urban or rural areas, for industrial, commercial, or domestic uses, must use water more wisely. This means reducing domestic use (e.g. re-using grey water, collecting and using rainwater), irrigating parks, sports fields, golf courses, farms and gardens more efficiently, economising in commercial and industrial processes, and reducing leakage from pipes. The Committee notes that minimising water use may not always be appropriate in emergency situations e.g. water used for fire fighting but this usage is infrequent and the volumes used miniscule compared to irrigation and for other purposes

We believe that allocating domestic users an “equitable amount” of water is an important principle to encourage urban residents to use water more wisely. Domestic users who take less than this equitable amount should then be rewarded for using less water, while taking those more should contribute more to the costs of water supply. The Committee notes that the cost of delivering water to the Christchurch public is low compared to similar systems in other parts of New Zealand, and that the ability of Councils to recover costs is constrained by legislation. The Committee also note that the per capita use of water in Christchurch is one of the highest in New Zealand. The two facts may be related.

The Committee accepts that not everybody in the zone will agree about the best way to encourage domestic users to use water more efficiently. We recognise that for the people of Christchurch, discussions about charging domestic users for the amount of water they use have historically been emotive. We emphasise strongly that any charge will not be for water as such but to cover the costs of constructing and maintaining the wells, pumps and pipes plus paying for the power. The charge would be for access to the water which in any case is paid for now as part of our general rates. For some people this resistance to countenance a separate payment is coupled with a perception that



agricultural irrigators enjoy “free” water, but irrigators pay for their own infrastructure and often, supply charges i.e. access to the water.

In developing the ZIP the Committee notes and highlights the following points:

- The CWMS sets targets for the efficient use of water for irrigation, stock water, industrial use, electricity generation, and community water use [e.g. By 2020, 10% reduction in community water use (litres per day per person) compared to 2010]
- The vast bulk of agricultural irrigation and dairying in Canterbury is outside this Zone and thus beyond the remit of this Committee
- The vast majority of Canterbury’s domestic water users are within this Zone
- The Committee’s recommendations are inclusive of agricultural, commercial, industrial, and domestic uses of water, in both rural and urban areas of the zone
- As noted above, per capita domestic water use in Christchurch is amongst the highest in New Zealand. *[insert reference]*

Ultimately, the Committee believes that if we are to realise the vision of the CWMS by 2040, we need to work out the best way for people in Christchurch West Melton Zone to use water more efficiently and manage demand both individually and collectively. It is essential that water continues to be available for community water supplies, industrial, commercial, and environmental uses. Agreeing a clear way forward on how to manage water demand is the first urgent step to take.

#### Our Priority Outcomes

The Canterbury Water Management Strategy (CWMS) has set specific targets for water efficiency. These targets particularly focus on irrigation, community, stockwater, industrial/commercial use and electricity generation in Canterbury. While electricity generation from hydro sources occurs in other zones, it does not occur in the Christchurch West Melton zone.

The Committee believe that managing demand for water in this Zone, through encouraging, incentivising and improving efficient use of water is an important part of reducing pressure on the resource. Greater efficiencies and less demand will help to ensure that water is available where it is most needed. In order to address this issue, the Committee have identified priority outcomes.

These are:

- Leakage from reticulated public water supplies is reduced
- Domestic use of water is more efficient
- Commercial and industrial use of water is more efficient
- Use of irrigation in both rural and urban areas is targeted and efficient
- Earthquake Recovery Programmes help to achieve efficient use of water and manage water demand

#### Links to CWMS

The Committee believe that achieving our priority outcomes will directly contribute to the implementation of the following CWMS Targets:

- Improving water use efficiency by encouraging best practice for irrigation; industrial/commercial and stockwater users.
- Reducing the litres per person per day used for community water supply and Increasing benefits per unit of water used

The Committee believe that achieving these priority outcomes will also contribute to achieving CWMS targets in other sections of the CWMS such as Ecosystem health/biodiversity and Kaitiakitanga because more water will be retained for in-stream values.

### Our Recommendations

The Committee have identified the actions that we recommend are implemented to achieve our priority outcomes (see table below). The 'Priority Outcome' column signifies the subject of the recommendation and the 'Who' column suggests the most appropriate lead organisation(s) for delivering on the recommendation. The Committee acknowledge that there may be individuals and agencies who will be involved but who are not listed.

Priority Outcomes	Ref. #	Recommendations	Who	Implement within
<b>EU1</b> Leakage from reticulated water supplies is reduced	1.1	a) Continue and strengthen existing work programmes b) Ensure work programmes take into account: <ul style="list-style-type: none"> <li>• The effects of earthquake damage</li> <li>• More resilient standards for water supply infrastructure</li> </ul> c) Update programmes where required	CCC, SDC	1 yr
<b>EU2</b> Domestic use of water is more efficient	2.1	a) Continue existing public communications and awareness raising initiatives b) Ensure the effectiveness of current initiatives and the potential benefits of inter-agency coordination c) Where required, update work programmes and implement these in a coordinated way.	CCC ECan SDC	1 yr
	2.2	Recommend the best mechanism(s) for encouraging more efficient use of water taken from Christchurch's community water supply	CCC	2 yrs
	2.3	Develop and implement a programme of action to give effect to the recommendations in 2.2	CCC	3-5 yrs
	2.4	Investigate and apply mechanism(s) to improve efficiency of water use from private domestic supplies	ECan	3-5 yrs
<b>EU3</b> Commercial and industrial use of water is more efficient	3.1	Require commercial and industrial users of water to demonstrate how they have implemented water efficiency plans	CCC SDC	Every 3 yrs
	3.2	Continue to charge commercial and industrial users for access to the water they use	CCC SDC	Ongoing
	3.3	a) Assess whether current statutory plans and enforcement activities require water efficiency plans to be established and implemented b) Where required, update statutory plans to achieve this	ECan	2 yrs
	3.4	Investigate and apply mechanisms to improve industrial and commercial water-use efficiency	ECan	3-5 yrs

<b>EU4</b> <b>Use of irrigation in both rural and urban areas is targeted and efficient</b>	4.1	a) Assess whether current statutory plans and enforcement activities require managers of irrigation systems to implement water efficiency plans b) Where required, update plans and enforcement activities to ensure this happens	ECan	2 yrs
	4.2	Identify and action best practice water use of publicly managed irrigation systems (e.g. sprinklers in parks)	CCC, ECan, SDC	Every 3 yrs
<b>EU5</b> <b>Earthquake Recovery Programmes help to achieve efficient use of water and manage water demand</b>	5.1	Work with CERA to identify opportunities for Earthquake Recovery Programmes to assist with the implementation of the following recommendations, where appropriate: EU1.1	CCC, ECan, SDC	6 months
	5.2	With reference to t The Committee provide guidance and advice on the implementation of Earthquake Recovery Programmes in the context of the CWMS	CCC, ECan, SDC	Ongoing to 2016

## APPENDIX

### SUMMARY INFORMATION ON THE CANTERBURY WATER MANAGEMENT STRATEGY

The strategy (CWMS 2010) provides a way forward towards the improved management and use of Canterbury's water resources. The CWMS (2010) Framework Document (Mayoral Forum 2009) sets out the key challenges, visions, principles and targets for the integrated management of Canterbury's water.

The expressed outcome 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."

The principles that underpin the CWMS (2010) will help to ensure that our water resource is managed sustainably:

- Primary principles - sustainable management, regional approach and Kaitiakitanga
- Supporting principles - natural character, indigenous biodiversity, access, quality drinking water, recreational opportunities, and community and commercial use.

Within the regional approach is a set of priorities for planning of natural water use. These are:

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

The strategy focuses on delivering a set of quantified and time constrained targets the following areas:

- Ecosystem health and biodiversity
- Natural character, processes and ecological health of braided rivers
- Kaitiakitanga
- Drinking water
- Recreational and amenity opportunities
- Water use efficiency
- Irrigated land area
- Energy security and efficiency
- Indicators of regional and national economies
- Environmental limits

The CWMS identified the need to establish Zone Committees to develop Zone Implementation Programmes that will implement the CWMS at a local level.

For more information on the Canterbury Water Management Strategy please refer to:

[http://ecan.govt.nz/get-involved/canterburywater/key-documents/Pages/CWMS \(2010\).aspx](http://ecan.govt.nz/get-involved/canterburywater/key-documents/Pages/CWMS (2010).aspx)

### ZONE COMMITTEE PROGRESS TO DATE

For a record of the Committee's discussions in developing the draft ZIP, please refer to

<http://ecan.govt.nz/get-involved/canterburywater/committees/chch-west-melton/Pages/default.aspx>

## GLOSSARY AND ACRONYMS

**Aquifer;** An aquifer is an underground layer of water-bearing permeable rock or unconsolidated materials (gravel, sand, or silt) within which water can move and groundwater can be extracted at a useful rate. This “useful” rate may vary widely depending on the intended use of the water

**Auspices;** Support; guidance

**Awa;** River

**Berms;** A flat strip of land, terrace bordering a river

**Biodiversity;** Shorthand for “biological diversity” – the number and variety of organisms found within a specified geographic region; and the variability among living organisms on the earth, including the variability within and between species and within and between ecosystems.

**Blue corridors;** Waterways

**Boggy Peat land;** A bog is a wetland that accumulates peat. Peat a deposit of dead plant material forms in wetland conditions, where saturation obstructs flows of oxygen from the atmosphere, reducing rates of decomposition.

**Braided River;** LWRP definition: any river with multiple successively divergent and rejoining channels separated by gravel islands.

**Catchment;** A catchment is an irregularly shaped area, bounded by natural topographic highs such as hills or mountains and within which surface and sub-surface water flows into streams, rivers and wetlands towards a single outlet.

**CCC;** Christchurch City Council

**CDHB;** Christchurch District Health Board

**Clay;** The finest fraction of sediment, less than .000002 metres mean diameter. It can stay in suspension for long periods.

**Collaborative Process;** People work creatively with each other to produce solutions that are acceptable to them all.

**Contact Recreation;** recreational activities that bring people physically in contact with water, involving a risk of involuntary ingestion or inhalation of water.

**CWMS;** Canterbury Water Management Strategy

**CWMS Fundamental Principles;** The Fundamental Principles that underpin the CWMS. They comprise:

- Primary principles – sustainable management, regional approach and kaitiakitanga
- Supporting principles – natural character, indigenous biodiversity, access, quality drinking water, recreational and amenity opportunities, community and commercial use.

**CWMS Priorities;** The CWMS determined first and second order priorities. They are:

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

**CWMS Targets;** The CWMS has set a desired outcome: *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.* The targets are an agreed way to measure progress toward this outcome. The targets include a set of goals applying from 2010 that reflect the fundamental principles of the CWMS. Targets are then set for 2015, 2020 and 2040 to provide a set of long-term environment, social, economic and cultural targets reflecting a sustainable development approach. The approval of zone and regional implementation programmes will be dependent on the programmes addressing all targets relevant to the zone or region. Targets have been developed for 10 topics:

1. Ecosystem health/biodiversity
2. Natural character of braided rivers
3. Kaitiakitanga
4. Drinking water
5. Recreational and amenity opportunities
6. Water-use efficiency
7. Irrigated land area

8. Energy security and efficiency
9. Regional and national economies
10. Environmental limits

**DoC;** Department of Conservation

**Native dryland ecosystem;** Native dryland ecosystems are rare in our zone They include , scrublands, shrublands, and grasslands..

**Equitable use;** The equal or fair use of resources, in this case water.

**ECan;** An abbreviation of Environment Canterbury, the Canterbury Regional Council

**Ecology;** The scientific study of the relationships that living organisms have with each other and with their natural environment. This includes the composition, distribution, amount (biomass), number, and changing states of organisms within and among ecosystems.

**Ecosystem;** Plants, animals, their physical environment and the dynamic processes that link them. (LWRP definition: means a system of interacting terrestrial or aquatic living organisms within their natural and physical environment)(UN Convention on Biological Diversity definition: A dynamic complex of plant, animal and micro-organism communities and their non-living environment, interacting as a functional unit.)

**Endemic;** Native to a particular region i.e. can only be found in that one area.

**Ephemeral;** Lasting for a short amount of time

**Fauna;** All the animal life of a particular region or habitat..

**Faecal contamination;** Contamination associated with excrement from warm blooded animals.

**Flatwater course;**

**Flora:** All the plant life of a particular region or habitat

**Freshes;** A short duration flow event that raises river levels slightly.

**Key Principles;** see ZIP Key Principles

**Grey water;** is a wastewater generated from domestic activities such as laundry, dishwashing, and bathing, but excluding toilet and urinal wastes which can be recycled on-site for uses such as landscape irrigation and constructed wetlands. It may contain pathogens).

**Groundwater;** Water located underground in rock crevices and pores/ layers of geological material.

Groundwater may supply wells and springs or may flow into rivers or offshore in a diffuse manner without emerging at the land surface.

**Habitat;** the natural home of plants or animals. A habitat has both biological and physical components which among other things may include; water, rocks, soil, or vegetation.

**Waterway Habitat health;** the assessed condition of the habitats, neighbouring and within a waterway which affect the flora and fauna.. It is affected by elements such as land-use, sediment composition and vegetation cover.

**Hapua;** Coastal/estuarine lagoon where food is collected.

**Harakeke;** Flax

**Hapū;** An alliance of related whānau. Subtribe (from Ngāi Tahu Freshwater Policy Statement)

**Headwaters;** The headwaters of a river or stream is the zone or point where a river or stream originates. It is the point furthest from its estuary or confluence with another river, as measured along the course of the river.

**Impermeable;** Does not allow liquid to pass through.

**Inanga;** whitebait species

**Indigenous;** Plants and animals occurring naturally in New Zealand i.e. having established without human intervention. The term indigenous may sometimes include flora and fauna introduced by Māori on arrival from their ancestral homeland Hawaiiki. .

**Interpretation Stations;** Often associated with signs that provide information about what people are seeing at a particular place, its history, and other facts/stories that may enhance the experience/appreciation of a site. Other forms of interpretation may use audio devices or more tactile/interactive media to enhance understanding.

**Invertebrates;** Animals that lack a backbone. They include animal groups such as sponges, cnidarians, flatworms, molluscs, arthropods, insects, segmented worms, and echinoderms as well as many other lesser-

known groups of animals.

**Irrigation;** LWRP definition: means the application of water to land for the purpose of assisting the production of vegetation or stock on that land, other than by naturally occurring rainfall, springs or rainfall run-off.

**Iwi;** An alliance of related hapū. Tribe (from Ngāi Tahu Freshwater Policy Statement)

**Kai;** Food

**Kai hau kai;** customary exchanges of gifts and resources between whānau/hapū, the creation and satisfaction of such obligations within the wider Ngāi Tahu tribe.

**Kaitiaki;** Guardians

**Kaitiakitanga;** In the context of resource management, kaitiakitanga means maintaining and enhancing the integrity of life so that the resources we all depend on to survive are sustained for the common health and wealth of the community. (from Ngāi Tahu Freshwater Policy Statement)

**Loess;** Wind borne silt eroded from uplands during glacial periods and later deposited often far away from the point of origin

**Mahinga Kai;** Food and other resources, the gathering of those resources and the areas they are sourced from.

**Mana;** Mana, as it applies to tangata (people), is the respect earned when respect is given. It embodies rights and responsibilities, leads to power and authority, and is the foundation stone of leadership. Mana can be inherited from your tūpuna (ancestors), but ultimately needs to be maintained or earned through ones deeds and demeanour. (from Ngāi Tahu Freshwater Policy Statement)

**Mana Whenua;** A metaphor for those recognised as holding the traditional rights and responsibilities within a particular takiwā to manage and govern natural resources for the long term benefit of their people.(from Ngāi Tahu Freshwater Policy Statement)

**Mauri;** The key Māori environmental indicator of nature's well-being (from Ngāi Tahu Freshwater Policy Statement)

**Na taonga tuku iho;**

**Nitrate;** A compound that is formed when nitrogen combines with oxygen. Nitrate is an important source of nitrogen which is an essential plant growth nutrient.. However, if soil contains more nitrate than plants can use, the excess can be leached from the soil and contaminate groundwater.

**Non-point source discharge;** LWRP definition: run-off or leachate from land onto or into land, a water body or the sea.

**Papatuanuku;** Mother Earth

**Permeability;** A measure of the ability of a material (such as rocks or soils) to transmit fluids

**Pingao;**

**Point source discharge** LWRP definition; means a discharge from a specific and identifiable outlet onto or into land, a water body or the sea.

**Pore spaces;** The space between the solid soil particles which can be filled with either water or air.

**Priority Issues;** See ZIP Priority Issues

**Priority Outcomes;** See ZIP Priority Outcomes

**Raranga;** Weaving

**Raupo;** Bullrush

**Reticulated water supply;** Water made available through a network (reticulation) of pipes, usually underground, as in most urban areas.

**Riparian planting;** Planting on the banks of rivers or streams to reduce erosion, pollution and to improve habitat and amenity..

**Riparian zone;** The zone near the bank or edge of a river or lake. This is the area where interaction occurs between land and water systems and is important for the management of water quality and ecological resources. Swamps and islands in a waterway are not strictly part of the riparian zone, but for practical management purposes are generally included in it.

**Rongoa species;** Medicinal species

**Rūnanga;** Assembly, Council. (from Ngāi Tahu Freshwater Policy Statement)

**Saltmarsh ecosystems;** Tidal wetlands that are regularly flooded by salt water. They are marshy because the soil may be deep mud and peat and have water tables near the land surface. Because salt marshes are frequently submerged and contain a lot of decomposing plant material, oxygen levels in the peat can be extremely low.

**Sand;** Particles between .00005 and .002 metres.

**Sediment;** A naturally occurring fine grained material created by weathering processes and erosion from solid rock. If fine enough it may be subsequently transported by the action of wind as loess, or else by water, ice or gravity down a steep slope.

**Set-back provisions;** The minimum prescribed distance between a building or structure and the boundaries of its site in relation to any nearby waterways.

**SDC;** Selwyn District Council

**Silt;** Particles sized between clay and sand. Between .000002 and .00005 metres. It may be carried by running water and deposited as a sediment.

**Spring fed waterways;** Waterways created by one, or many springs usually near the headwaters.

**Spring head;** The first source from which water flows for a spring fed waterway.

**Stockwater Systems** Networks of small water races or pipe schemes supplying rural properties..

**Stormwater;** Surface water run-off, usually of low quality, that is either diffuse or discharged via a conduit or drain (lined or unlined) directly from surface areas into a natural watercourse or onto or into land.)

**Surface water;** LWRP definition: Surface water or surface water body means water above the ground surface and within a lake, river artificial watercourse or wetland, but does not include water in the sea, snow or rain or water vapour in the air.

**Takiwā;** District or region within which a particular hapū or iwi is recognised as holding mana whenua/mana moana (from Ngāi Tahu Freshwater Policy Statement).

**Tangata Whenua;** Literally means 'people of the land' (tangata = people, whenua = land) and refers to iwi, hapū or whānau who hold mana whenua over a given area/takiwā. The identification of tangata whenua rights to this region are identified by succession to an ancestor who was allocated lands to the area in 1868 by the Native Land Court. Such land allocations identify the ancestors who held turangawaewae at that time and provides for the identification of their descendants and their future descendants. (from Ngāi Tahu Freshwater Policy Statement)

**Taonga;** Treasured possession, material or abstract (e.g. language); Māori interest in these is protected by the treaty of Waitangi and New Zealand statute and common law/lore.

**Targets;** see CWMS Targets

**The Committee;** the Christchurch West Melton Zone Committee

**Tributaries;** A smaller river or stream flowing into a larger river or lake.

**Tuna;** Eel

**Turangawaewae;** A person's right to stand in a particular place and speak on matters affecting them or their whānau (from Ngāi Tahu Freshwater Policy Statement)

**Urupā;** Burial place, cemetery.

**Wadeable reaches;** Shallow streams that can be accessed without a boat.

**Waiora;** Waters used for healing by tohunga (expert). These waters were pure and fresh running.

**Waipuna;** Important springs

**Wāhi raranga;** Sources of weaving material

**Wāhi Taonga;** Places treasured for their particular significance to Māori culture but which may not necessarily be sacred or restricted. (from Ngāi Tahu Freshwater Policy Statement)

**Wāhi Tapu;** Places of significance that are imbued with an element of taboo (sacredness or restriction) due to a certain event or situation. (from Ngāi Tahu Freshwater Policy Statement).

**Waka;** Canoe

**Wastewater;** Any water that has been used in a washing, flushing or manufacturing process and so contains waste products.



**Waterway;** A river, channel or other surface route that allows a flow of water.

**Water abstraction;** Abstraction in relation to a water body, means the taking of water either temporarily or permanently. Most water is used for irrigation or drinking water.

**Whānau;** Extended family units. The essential building block of Traditional Māori society. (from Ngāi Tahu Freshwater Policy Statement)

**Whanaungatanga;** The relationship which binds people together through common genealogy; unity of purpose and mutual support.

**Whare;** House

**Whitewater course**

**Wetlands;** RMA definition: includes permanently or intermittently wet areas, shallow water, and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions.

**ZC;** Zone committee

**ZIP Key Principles;** Principles that are woven throughout the ZIP that must be taken into account when Priority Outcomes and Recommendations are being implemented. They are: Kaitiakitanga, Better integration of plans and collaboration between agencies and groups, Earthquake recovery programmes help to implement the CWMS in the Zone, Local people are involved in improving water management, The effects of improving flood management are beneficial to a spectrum of waterway values.

**ZIP Priority Issues:** Five Priority Issues that the Committee believes need to be addressed urgently in the zone in order to implement the CWMS i.e. i) Enhancing and managing waterways for recreation, relaxation and amenity. ii) Improving surface water quality and safeguarding surface water flows. iii) Enhancing healthy ecosystems, native biodiversity and valued introduced species. iv) Safeguarding groundwater quality and flows for multiple uses and v) Making efficient use of water and managing demand.

**ZIP Priority Outcomes:** Outcomes for each of the five Priority Issues that the Committee believe need to be achieved, as a priority, if the Targets in the CWMS are to be achieved.

WORKING DRAFT FOR COMMITTEE