

# Upper Waitaki ZIP Addendum

July 2015



## ZIP Addendum: Upper Waitaki

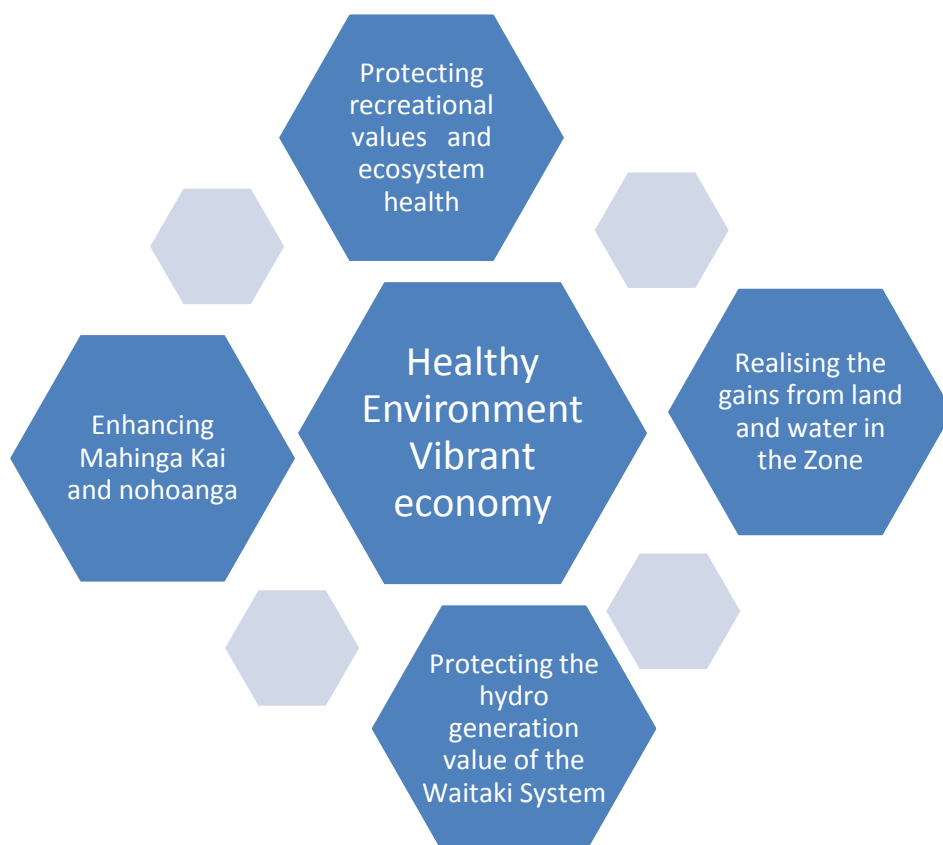


## Introduction

This package covers both water quality limits and non-statutory actions to implement the Canterbury Water Management Strategy (CWMS) in the Zone. A major vehicle for implementing the recommendations will be the Waitaki Sub Regional section of the Land and Water Regional Plan (LWRP). This document will become an addendum to the Upper Waitaki Zone Implementation programme

The following is a package and is designed to be read and implemented as a whole. The package aims to:

- maintain the oligotrophic state of Lake Benmore,
- maintain the ecosystem health of the streams in the zone, and improve the ecosystem health of the 'impacted' stream in the zone,
- address 'hotspots' of elevated contaminants<sup>1</sup>,
- improve mahinga kai gathering and nohoanga,
- provide for the development of small blocks on extensive properties to maintain the viability and resilience of farming systems in the zone and any large scale development is done incrementally
- provide for consented aquaculture and urban expansion




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<sup>1</sup> Contaminants of concern in this context include nutrients (nitrogen and phosphorus), sediment, and faecal contaminants

## Outcomes

The Zone Committee developed the following **outcomes** under the CWMS for the area:

Water quality and quantity provide for aquatic biodiversity, recreational opportunities, and customary use

- There is no further reduction in water quality in the Zone
- All lakes and rivers are safe for contact recreation
- The water quality for Lake Benmore is at all times of the year consistent with its very high recreational value
- The biodiversity of the Zone's water bodies and high quality drylands is protected and enhanced
- There is improved mahinga kai gathering in the Zone
- Maintain the current water quality delivered to the Waitaki River

Maintenance of communities and sustainable growth

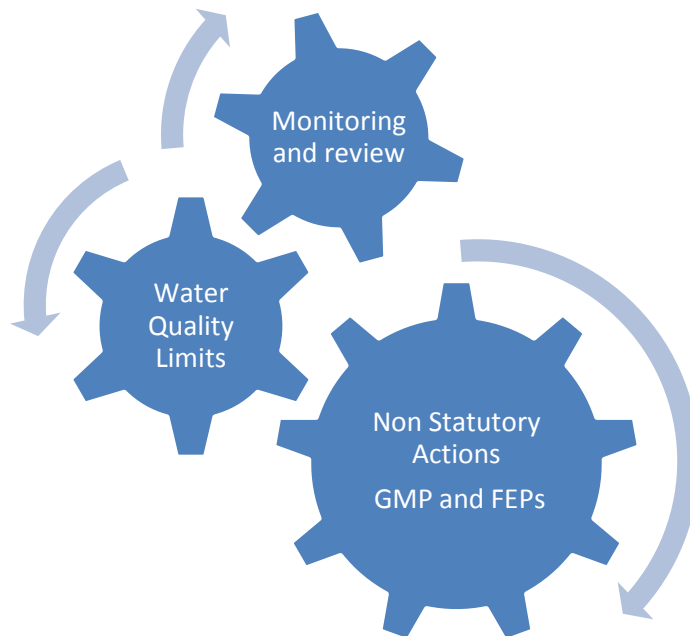
- The Zone has safe and secure drinking water for community and domestic supplies
- Highly reliable irrigation water, to a target of 95% reliability, is available in the Zone
- The Zone's existing contribution to New Zealand's security of electricity supply is maintained or increased
- The contribution to the Zone's economy from Agriculture and Aquaculture is maintained or increased, in particular sustainable farming systems
- The economic contribution from Tourism based on the Zone's lakes and rivers and biodiversity is maintained or increased
- The Zone has a vibrant community, including: improved social infrastructure and a diverse economy



## Major Pathways

The major pathways to achieve the outcomes are listed below and form the basis of the recommendations. They are designed as an integrated package and include:

1. Good Management Practice (GMP) for 'land and resource use'<sup>2</sup> and the use of Farm Environment Plans (FEPs) or similar to activate and demonstrate good practice
2. Support for catchment groups taking collective action to reduce losses contaminants, prioritised where they are addressing identified at-risk areas
3. Improved management of visitor impacts on water bodies
4. A whole of waterway rehabilitation programme for the currently impacted stream in the Zone
5. Enhancement of nohoanga, improved health of key waterways for customary use, and enhancement of mahinga kai opportunities
6. Catchment load limits for nitrogen for agriculture, aquaculture, and urban development
7. An enabling consenting pathway for small block development on extensive properties



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<sup>2</sup> Includes Agriculture, Aquaculture and Urban development

## The Mackenzie Agreement

In December 2014 the Upper Waitaki Zone Committee resolved to use the Mackenzie Agreement to inform Zone Committee work and give effect to the agreement where appropriate. There is a strong synergy between what the Mackenzie Agreement and the Upper Waitaki Zone Committee aims to achieve in the Mackenzie country. The key elements are the same: collaborative approach to decision making, a balanced and prosperous community, a mix of landuse including irrigation, and management of the cumulative effects of landuse on water quality. Both aim to achieve:

- A balanced and prosperous community
- A mix of landuses, irrigated and dryland development, and tourism development
- Small blocks of irrigation on extensive properties for enhanced viability\*
- Management of the cumulative effects of landuse on water quality through catchment load limits
- Increased area of irrigation
- The protection and enhancement of dryland and wetland biodiversity
- Control of invasive weeds and pests
- A collaborative approach to problem solving and governance
- Managing for shared values
- The use of science and monitoring to inform decision making

In this document and through the Zone Committee process, relevant parts of the agreement are progressed by:

1. Establishing limits to manage the cumulative effects of landuse on water quality
2. Enabling the balance of the 25,000ha of irrigation, within the limits\*\*
3. Providing incentives for development that is accompanied by set aside conservation areas
4. Recommending a nitrogen allocation framework that enables the development of small blocks on extensive properties. The use of modified equal allocation for the headroom that is available in the Haldon Arm, will allow properties to develop small blocks, using the allocation tied to their land
5. The collation and integration of science and monitoring (economic, biophysical, social, cultural)
6. The provision of a platform for collaborative decision making and management
7. The committee allocating Immediate Steps Biodiversity funding to the protection of dryland ecosystems – specifically fencing and weed control to allow ecosystem recovery
8. The committee encouraging District Councils and Environment Canterbury to work together to provide connections between the sub-regional plan and district plans
9. In the future the committee could work to provide other agencies with an opportunity to use the Zone Committee as a platform to work through issues in a collaborative forum

The aspects of the agreement which are outside the committee scope include:

1. The establishment of a Mackenzie Country Trust
2. Provision of national and international tourism profile and promotion
3. Funding for external payments to set aside development rights

\*The Mackenzie Agreement also mentions a small number of large blocks of irrigation development. Those that have been granted consent in the recent process are provided for within the limits.

\*\* Subject to other constraints such as biodiversity targets and District Plan rules

## ***Layout***

Lake Benmore is the receiving environment for all water in the Zone above the Benmore Dam. The Haldon Arm and the Ahuriri Arm of the lake have distinct characteristics and values and require their own limits.

Lakes Aviemore and Waitaki have their own catchments, but with very short residence times they are influenced predominantly by Lake Benmore.

Water quality delivery to the Waitaki River (and Lower Waitaki Zone) at Kurow is also influenced predominantly by the status of Lake Benmore.

Water Quality limits are being set for the Waitaki River and its tributaries at the same time. The key node of interaction between Upper Waitaki (the lakes) and Lower Waitaki (the river), is the water quality delivered to the Waitaki River over the Waitaki dam.

This document contains aspects of the solution which apply across the Zone first, followed by further detailed specifics in each sub-catchment.

The package is split into the following parts:

- 1. Cross-Zone**
- 2. The Haldon Arm of Lake Benmore**
- 3. The Ahuriri Arm of Lake Benmore**
- 4. Lakes Aviemore and Waitaki**
- 5. Implementation, Monitoring and Review**

## 1. Cross Zone

The following apply across each of the Zone's sub catchments.

### **Recommendations: Managing the impact of recreational users on lakes and rivers**

1. *All lakeside campgrounds and huts have contained wastewater systems, or other technical solutions, that mitigate any effects on water quality*
2. *Key sites for the provision of new toilets at recreation spots, are identified along with options to fund these facilities, by Councils working with the Zone Committee and public landmangers*
3. *Environment Canterbury submit on the Long Term Plans of the two District Councils to ensure funds are set aside to help implement recommendation 1.2*
4. *Land managers of camping areas produce and implement plans to manage the environmental effect of the activity*
5. *A 'Love your Lakes' campaign is run by the joint councils, to encourage recreational users to look after the lakes in the Upper Waitaki*
6. *The Zone Committee encourages a consistent approach to the management of freedom camping in the Zone, including on land that is managed by LINZ and NZTA*

The lakes and other water bodies of the Upper Waitaki draw thousands of visitors a year and contribute an estimated \$90M to the regional economy; however they are not without impact on the recreational value of the lakes themselves. There is an urgent need for more toilet facilities alongside the lakes, as well as an educational campaign to encourage users to take away their rubbish and use the toilet facilities. There is also a need to manage any risk posed to lake water quality lakeside campgrounds.

### **Recommendations: Farm Environment Plans (FEPs), Good Management Practice (GMP), and Catchment Groups**

7. *Farm Environment Plans (FEPs) are necessary for all farm types (including agriculture and aquaculture) to facilitate and demonstrate good management practice and these are audited as part of a consent regime*
8. *FEPs in the Upper Waitaki are able to link to Territorial Authority requirements for biodiversity management, if feasible*
9. *Good Management Practice(GMP) is required for all land and resource-use*
10. *Good management practice is required for the treatment and disposal of urban and household wastewater, in accordance with the Land and Water Regional Plan*
11. *District Councils consider innovative approaches to the productive use of treated wastewater*
12. *Land Managers of Public and Conservation land identify and manage activities that pose a risk to water quality*
13. *Environment Canterbury and Industry support Catchment Groups, where these are working on collective actions to reduce losses of contaminants and working on wetland and riparian management;, prioritised in at-risk catchments*



Farm Environment Plans are a key method for dealing with contaminant management and driving/demonstrating good management practice, including management of indigenous biodiversity. Both FEP and GMP equivalents will be needed for aquaculture and urban wastewater, so that all contributors play an equal part in managing water quality. Public and conservation land makes up a large proportion of the zone, and while it is home to low impact activities, risk to water quality still needs to be identified and managed.

### **Recommendations: Alignment with district planning**

14. *Environment Canterbury and District Councils explore options so that one FEP could cover regional and district requirements for land/resource management*
15. *Environment Canterbury and District Councils work together so to ensure alignment and synergy (and avoidance of duplication and conflict) between sub regional and district plans*

Both Mackenzie and Waitaki District Councils are undertaking or will shortly be undertaking District Plan reviews. Any use of farm plans as part of district plan requirements need to be able to align with the same farm plan required for regional plans. Councils need to continue to work together to reduce the demand on the community and ensure alignment of community outcomes.

### **Recommendations: Water Quality Limits**

16. *The Sub Regional section sets catchment load limits for urban, agricultural, and aquaculture discharges of nitrogen (Appendix One)*
17. *The Sub Regional section is enabling of small block development<sup>3</sup>, that is within the catchment load and allocation limits, and moreover has an area of conservation provided for*
18. *The Sub Regional section applies lower regulatory pressure where resource -users are operating within limits and at good practice, and strong regulatory pressure where resource–users do not operate at good practice*
19. *The Sub Regional section enables land-users to collectively manage and report on their nitrogen losses in sub-catchments e.g. operating as nutrient users groups*

Catchment load limits need to be set for all industries to be effective. The Zone Committee want to be able to enable the development of small blocks on extensive properties and for there to be less regulatory pressure where land-users are farming within limits and taking actions to protect biodiversity. By allowing nutrient user groups (along the same lines as a water user group) farmers would be able to work collectively to manage to limits, without breaching the load limits. Sub-catchments would have to be at an appropriate scale e.g. Omarama Stream.

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<sup>3</sup> possibly % of a property and/or ha limit proportional to load available

## **Recommendations: Allocation of the Nitrogen Load Limit**

20. *The Sub regional section uses the nitrogen allocation framework outlined in Appendix 2*
21. *The following is to be achieved through the allocation framework*
  - *Protection of the integrity of the catchment load limits and water quality outcomes*
  - *Enabling small block development on extensive properties and flexibility for low emitters*
  - *Avoidance of load aggregation*
  - *Avoidance of localised effects on water quality*
22. *A parallel workstream is implemented in the Ahuriri Arm to develop catchment scale mitigations to reduce the nutrient load to the lake; involving Environment Canterbury, Waitaki District Council, farmers, Meridian, and DOC working together*

The allocation framework in Appendix Two has been developed by a working group over the past seven months. The group has been made up of an expanded agriculture information group and aquaculture information group and has been open to the public to contribute, including Ngāi Tahu and Industry. The group explored a range of allocation options and how these would work or not work in the Upper Waitaki. The final framework was agreed by consensus on the 1<sup>st</sup> of April 2015. Additionally a whole of catchment effort is needed in the Ahuriri Arm to try and create some headroom at a catchment scale. This would operate as a parallel workstream to plan and implement catchment scale mitigations e.g. stream rehabilitation, wetland creation, augmentation, land purchase etc. The parties involved in this group would need to include ECan (facilitate), Waitaki District Council, farmers, Meridian, and DOC. The gains (in the form of nutrient load reduction) from this work would need to be quantified, including tools to quantify gains.

## **Recommendations: Enabling biodiversity enhancements**

23. *The Sub Regional section is enabling of the actions in the Immediate Steps Biodiversity Programme, in-stream actions to enhance habitat, and interventions to manage fish passage*
24. *Environment Canterbury, Tangata Whenua, and the wider community work together to identify and realize opportunities for improved management of fish passage and mahinga kai gathering<sup>4</sup>*
25. *DOC and Tangata Whenua work together regarding the re-introduction of weka into the Waitaki*
26. *The Zone Committee support the ban on commercial eeling in the Ahuriri Arm of Lake Benmore being extended to include the Haldon Arm*
27. *District and/or Regional Plans incentivise biodiversity protection through enabling development that is accompanied by suitable conservation*

There is a need to facilitate the ongoing protection of biodiversity through the immediate Steps Programme and to identify opportunities to enhance mahinga kai gathering in the zone – including improving management of fish passage, actions to protect and enhance water quality, re-

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<sup>4</sup> See sub-catchment sections for specifics

introduction of species and improved access. Section 3 details specifics. Currently longfin eel/tuna are transported into the Upper Waitaki by Tangata Whenua via the 'trap and transfer programme'. These tuna are then protected from commercial harvest in the Ahuriri Arm, but not the Haldon Arm.

### **Recommendations: Consent Conditions**

- 28. Where there is sufficient evidence that trigger levels set in existing consent conditions are below natural nutrient levels, investigate options to resolve the issue*
- 29. Ensure monitoring conditions are equivalent for aquaculture and agriculture (i.e. use of Overseer or some other accounting / modelling or monitoring system to calculate N loss)*

It has been brought to the committee's attention that some newly granted consents have trigger levels for nutrients which are lower than the nutrient levels in the streams, where the particular stream leaves undeveloped high country land. This is clearly not appropriate or equitable therefore more suitable planning provisions, waterway classifications or arrangements with consent holders need to be investigated.

### **Recommendations: Alignment with the National Policy Statement on Freshwater Management (NPS)**

- 30. The Zone Committee supports the setting of one Fresh Water Management Unit for the Upper Waitaki Zone, providing this allows for differential sub-catchment management within the Zone*
- 31. The Zone Committee considers all the national values identified in the NPS as appropriate for the Upper Waitaki*
- 32. The Zone Committee acknowledges that Appendix Three of the NPS has not been populated, when considering the above recommendations*

Freshwater management units are the spatial scale for setting limits. The Upper Waitaki zone makes hydrological sense and represents a community of interest. The committee intends that sub-catchment limits are set within the Upper Waitaki.

The national values in the NPS align with the community outcomes that the committee has identified for the Upper Waitaki under the CWMS. These national values are: ecosystem health, human health for recreation, natural form and character, mahinga kai, fishing, irrigation and food production, animal drinking water, wai tapu (the places where ceremonies can be performed), water supply for drinking, hydroelectric power generation, and transport.

### **Recommendation: Understanding of Ngāi Tahu cultural values**

- 33. Te Rūnanga o Ngāi Tahu provide a map (or text) for this document that shows the significant Ngāi Tahu cultural history in the Waitaki*

Maps used during the scenario process with the local community, have helped with a shared understanding of Ngāi Tahu history in the Waitaki. The use of a map or similar in the document would help record and bed-in this understanding.

## 2. Haldon Arm Lake Benmore

The solution package aims to maintain the Haldon Arm in an oligotrophic state while providing for the development of small blocks on extensive properties, protecting groundwater, and maintaining the ecosystem health in the rivers and streams. The Haldon Arm contains the following sensitive lakes: Alexandrina/MacGregor, Middleton, and Wairepo Arm/Kellands Pond. These lakes require different management to the wider Haldon Arm as they are sensitive to nutrient enrichment.

### Recommendations: Catchment Load Limits

1. *The Sub Regional section requires Good Management Practice for nitrogen loss (N) (kg/ha/yr) on all farms from 2017*
2. *The Sub Regional section bases the catchment load limit on a trophic level index of 2.7 at the Haldon arm site, and 2.7 at the Benmore dam site.*
3. *The Sub Regional implementation contains a trigger mechanism so that TLI measurements that are outliers from the normal range trigger an investigation and subsequent action based on whether these outliers are due to point source discharges, natural events, or the cumulative effects of land-use (also see 5.4)*
4. *The Sub Regional section sets an N catchment load limit (tonnes/yr) based on the table in Appendix One and the allocation framework in Appendix Two for agriculture, urban, and aquaculture discharges*

The Haldon Arm of Lake Benmore is the more resilient of the two arms of the lake, due to its size and inflows of high quality water from the Ohau C canal. The Zone Committee acknowledges that there is significant variation in TLI measurements due to: seasonal variation, location in the lake sampled, natural events, and the way the lake is managed. Therefore the focus is on controlling the manageable load of nutrients to the lake and accepting that there will be a range of TLI measurements.

### Recommendations: Lake Middleton

5. *The Sub-regional section seeks to prohibit an increase in nitrogen leaching within the Lake Middleton sensitive lake zone (consistent with pLWRP approach for sensitive lake zones, but requiring GMP for current land-use)*
6. *Review the efficacy of wastewater holding tanks in the catchment of Lake Middleton*
7. *Investigate the re-connection of Lake Middleton with Lake Ohau*

Lake Middleton is currently considered to not be meeting water quality outcomes. The lake was once part of Lake Ohau and over time natural processes and then development of a road have separated it from the main lake. Now the lake is a perfect nutrient sink with no outlet. The proposed solution is to cap the low intensity agricultural load in the catchment,

ensure that domestic waste-water is not entering the lake, and investigate the reconnection of the lake with Lake Ohau, possibly through a culvert/s, to improve its health.

### **Recommendations: Lake Alexandrina/McGregor**

8. *The Sub-regional section seeks to prohibit an increase in nitrogen leaching within the Lake Alexandrina/McGregor sensitive lake zone (consistent with pLWRP approach for sensitive lake zones, but requiring GMP for current land-use)*
9. *Review the efficacy of wastewater holding tanks at the Lake Alexandrina Huts*

Lake Alexandrina is a highly valued recreational lake, with a large number of huts in three settlements in the basin of the lake, and extensive farmland in the wider catchment. Work in the 1980s was undertaken to reduce phosphorus inputs into the lake, including the removal of stock from the lake basin. The remaining risk to be managed is to ensure that wastewater from the adjacent hut settlements is not entering the lake.

### **Recommendations: Wairepo Arm of Lake Ruataniwha and Kellands Pond**

10. *The Sub-regional section seeks to prohibit an increase in nitrogen leaching within the Wairepo/Kellands Pond sensitive lake zone (consistent with pLWRP approach for sensitive lake zones, but requiring GMP for current land-use)*
11. *Environment Canterbury investigate the movement of nutrients and water both into and within the arm via groundwater and surface water*
12. *Based on the results of the above investigation and as the planning cycle allows, Environment Canterbury work with the Zone Committee and resource users of the catchment to develop a specific regime for the catchment which maintains or improves water quality and provides flexibility for resource users*

Wairepo Arm is a complex water body connecting Lake Ruataniwha, the Ohau B canal, Wairepo Creek, and Kellands Ponds. A number of studies have investigated various aspects of water and nutrient movement, but none are definitive. There is a need to compile these reports and possibly complete new work to fully understand this catchment and how it is best managed. There is the desire for a more locally suited regime for management of the catchment, however this needs to be informed by more complete science, therefore the proposal is to stay with the regional rules which can be implemented in the meantime.

### 3. Ahuriri Arm Lake Benmore

The solution aims to maintain the Ahuriri Arm in an oligotrophic state by setting a catchment load limit based on the current consented load – this means the arm of the lake is at its limit and any new development will be required to come from within this load. This load is based on all current activities in the catchment, including currently implemented consents and unimplemented consents granted in the 2009-2011 UW resource consent process. It also aims to improve the ecological health of the Willowburn, rehabilitate the nohoanga<sup>5</sup>, and enhance mahinga kai gathering in the customary fishing area of the spring-fed streams.

#### Recommendations: Catchment Load Limits

1. *The Sub Regional section requires Good Management Practice for nitrogen loss (N) (kg/ha/yr) on all farms from 2017*
2. *The Sub Regional section bases the catchment load limit on a trophic level index of 2.9 at the Ahuriri arm site and 2.7 at the Benmore dam site.*
3. *The Sub Regional section implementation contains a trigger mechanism so that TLI measurements that are outliers from the normal range, trigger an investigation and subsequent action based on whether these outliers are due to point source discharges, natural events, or the cumulative effects of land-use (also see 5.4)*
4. *The Sub Regional section sets an N catchment load limit (tonnes/yr) based on the tables in Appendix One and the allocation framework in Appendix Two*

The Ahuriri Arm is the more sensitive of the two arms due to its lower catchment inflows and hydraulic characteristics. The development scenarios that were explored as part of the limit setting process all predicted the Ahuriri Arm to move into the next trophic band. Therefore, the load limit has been set at the current consented load and any new development in the arm will have to come from **within** this load. The Zone Committee acknowledges that there is significant variation in TLI measurements due to: seasonal variation, location in the lake sampled, natural events, and the way the lake is managed. Therefore the focus is on controlling the manageable load of nutrients to the lake and accepting that there will be a range of TLI measurements. The modeling of lake trophic state has assumed a 'steady-state' load into the lake (equal to the consented load), therefore should allow for lag effects; however a trigger system with the opportunity for action/review of the load limits is a vital component of this recommendation, given that the Arm is currently close to the oligotrophic/mesotrophic boundary.

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<sup>5</sup> Temporary campsite

### **Recommendations: Urban waste-water management**

5. *The Omarama township wastewater discharge leaves Omarama stream and goes to ground by December 2019*
6. *Urban wastewater treatment and disposal in all areas follows good management practice*

Omarama Township's treated wastewater is currently discharged to Omarama Stream. This urban discharge is due to go to ground by December 2019. Urban discharge will also be capped in Appendix One.

### **Recommendations: River Management**

7. *Environment Canterbury continues to monitor the impact of erosion at Clay Cliffs and sediment movement in the Ahuriri River and accumulation in the delta (also see 5.2)*

The Ahuriri River is currently eroding land near Clay Cliffs and there is evidence of increased sediment in the Ahuriri Delta. The Zone Committee has received engineering and lake science advice regarding this. It appears the loss of material near Clay Cliffs is not contributing to the Ahuriri Arm trophic state through phosphorus inputs, and an engineering intervention at Clay Cliffs would cost hundreds of thousands of dollars and need ongoing maintenance. Moreover, an intervention would pose a risk to other downstream/across river sites by artificially moving the river channels.

### **Recommendations: Spring-fed streams of the Ahuriri Customary Fishing Area, Nohoanga, and Mahinga Kai**

8. *Environment Canterbury, in conjunction with Benmore Irrigation Company, Tangata Whenua, and local landowners, plan and implement a whole of catchment rehabilitation programme on the Willowburn with the following features:*
  - a. *Identification and management of critical source areas, for sediment and phosphorus loss on every farm in the catchment*
  - b. *Good management Practice for nitrate losses on-farm*
  - c. *Implementation/remediation of appropriate riparian management*
  - d. *Removal of legacy sediment in the stream bed*
  - e. *Removal of in-stream blockages*
  - f. *Rehabilitation of the ecological and cultural health of the nohoanga at the confluence of the Willowburn and the Ahuriri Rivers, including invasive plant control and stream bed and wetland restoration*

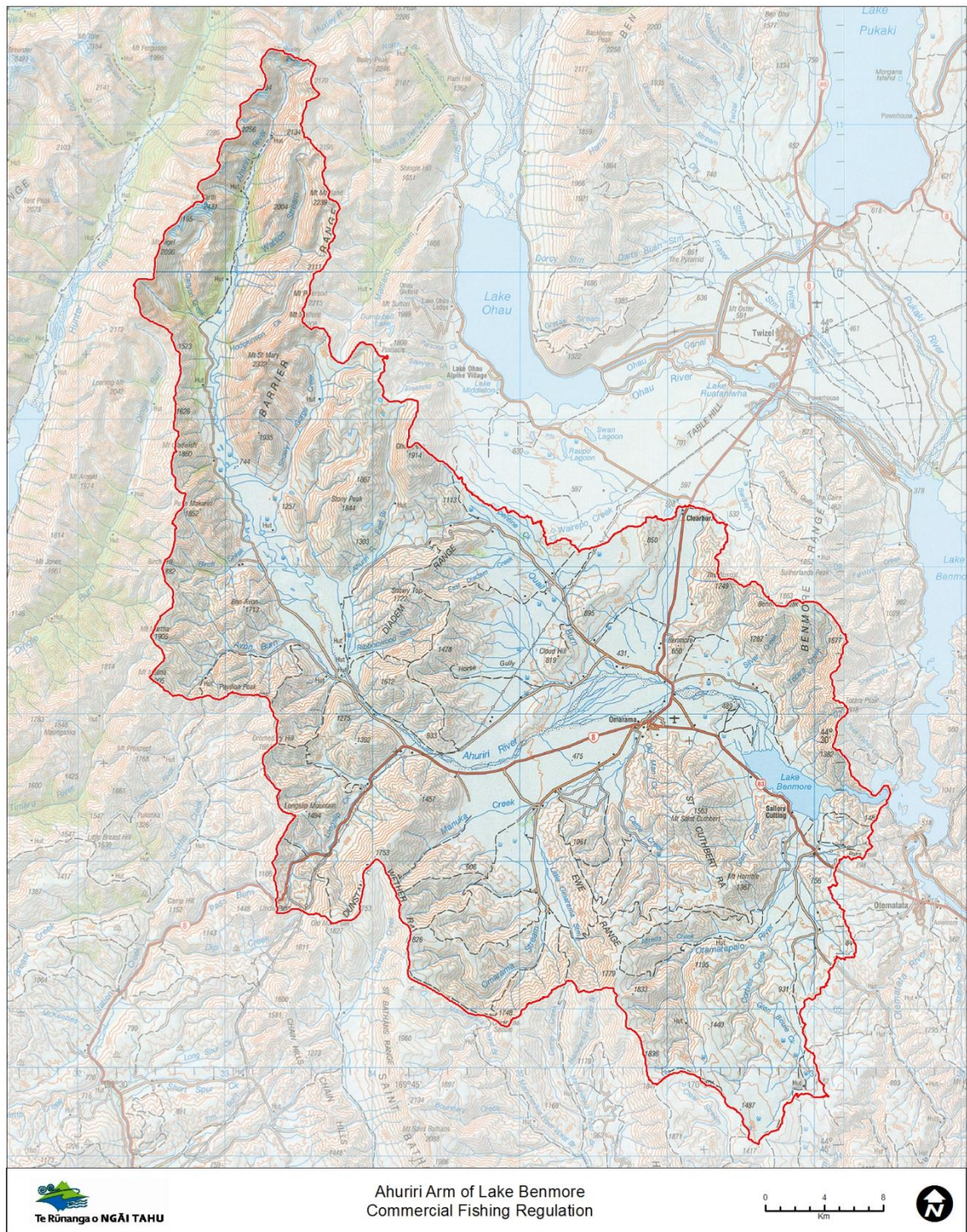
The Willowburn is the only stream in the Upper Waitaki that is classified as 'impacted'. It has sediment smothering the stream bed, stream blockages from willows, and low macro



invertebrate scores. It is also a key waterway culturally as a customary fishery and the site of a temporary campsite (nohoanga) at the confluence with the Ahuriri.

9. *Environment Canterbury and landowners integrate opportunities for enhancing mahinga kai into catchment work in the Omarama Stream and Henburn/Quailburn catchments*
10. *Explore and implement opportunities to enhance fish passage in the customary area, including potential use of infrastructure to link lakes and streams where these have been disconnected, but only if these actions would not place native species under threat*

The spring-fed streams of the Ahuriri Arm of Lake Benmore are highly valued as a customary fishing resource and therefore these catchments are a priority for catchment actions. The actions needed to improve the value of these waterways include: enhancing management of fish passage, protecting and enhancing wetlands, managing E.coli, sediment and phosphorus, and improving access. A map showing the customary fishing area is shown following.



#### 4. Lakes Aviemore and Waitaki

The solution aims to maintain an oligotrophic state in Lakes Aviemore and Waitaki, and protect the water quality delivered to the Waitaki River.

##### Recommendations: Catchment Load Limits

1. *The Sub Regional section requires Good Management Practice for nitrogen loss (N) (kg/ha/yr) on all farms from 2017*
2. *The Sub Regional section bases the catchment load limit on a trophic level index of 2.0*
3. *The Sub Regional section sets an N catchment load limit (tonnes/yr) based on the tables in Appendix One and the allocation framework in Appendix Two*
4. *The Sub Regional Section manages the risk to the Waitaki River by restricting in-lake developments*

Lakes Aviemore and Waitaki have very short residence times (that water spends in the lakes) of 14 days and 1.1. day respectively. The catchments of the two lakes are naturally limited for development by slope, elevation, temperature and rainfall. However, given the short residence times, any in-lake development (especially those that discharge ammonia), must be very carefully managed to avoid risking impacts on the Waitaki River.

##### Recommendations: River Management

5. *Environment Canterbury, Waitaki District Council, Meridian, Ahuriri Community board, and NZTA work together to come up with a funding solution to address the legacy gravel in the Otematata River and Parsons Creek*

Gravel aggregation and vegetation in the Otematata River and Parsons Creek is causing elevated flood risk to the township and campground. Periodic gravel removal around the bridge is undertaken by NZTA; however a large wall of legacy gravel needs to be removed so that any ongoing removal is effective.

## 5. Implementation, Monitoring, and Review

A key part of the package is monitoring and review. A Plan review will need to assess the effectiveness of the water quality limits and non-statutory actions in delivering on the water quality outcomes after ten years.

### Recommendations:

1. *Environment Canterbury review the Sub Regional section in 2026 and on the basis of review of progress towards achieving environmental outcomes, initiate a plan change to revise any or all of:*
  - *GMP numbers (e.g. N in kg/ha/yr),*
  - *the catchment load limits,*
  - *the allocation of the load,*
2. *Environment Canterbury carry out technical investigations to support the review in 2026 such as:*
  - *Investigate the movement of nutrients and water both into and within the Wairepo Arm of Lake Ruataniwha*
  - *Evaluation of catchment interventions in Sensitive Lake Zones*
  - *Evaluate the continued sediment inputs to the Ahuriri Arm from natural processes and the influence of extreme climatic events on lake TLI*
3. *Environment Canterbury design an integrated monitoring framework for the Upper Waitaki which includes:*
  - *ECan and consent holder data*
  - *Protocols for monitoring*
  - *Making data available and accessible*
4. *Environment Canterbury work with the Zone Committee and key stakeholders to develop an adaptive management regime for the Upper Waitaki that works as a meaningful feedback loop*
5. *Environment Canterbury work with Overseer owners and partners to:*
  - *Continuously improve Overseer and other nutrient management tools*

**Appendix One: Table A - Draft N-load limits for farming and aquaculture**

Catchment		Load limit (t/yr)	
<b>Haldon Arm of Lake Benmore</b>		1972 <sup>6</sup>	The load limit is based on Scenario 2a which provides for some further development beyond consented, based on small blocks.
<b>Ahuriri Arm of Lake Benmore</b>		516	The load limit is based on the current consented load; therefore any new development needs to come from within this load and the allocation of the load.
<b>Lake Aviemore</b>		403	The load limit is based on Scenario 2a which provides for some further development beyond consented, based on small blocks.
<b>Lake Waitaki</b>			

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<sup>6</sup> Catchment load figures are draft as at 19 January 2015, and are subject to change as modelling data is reviewed

**Appendix One: Table B - Draft N-load limits for urban wastewater**

Catchment		*Load limit (t/yr)	
<b>Haldon Arm</b>	Tekapo Township Twizel Township Mt Cook Village	Tekapo = 22 tN/yr Twizel = 18 tN/yr Mt Cook = 3.5 t N/yr	<ul style="list-style-type: none"> <li>Consented and future township expansion can occur within the limit</li> </ul>
<b>Ahuriri Arm</b>	Omarama Township	Omarama = 10 tN/yr	<ul style="list-style-type: none"> <li>Consented township expansion can occur within the limit</li> </ul>
<b>Lake Aviemore</b>	Otematata Township	Otematata = 3.5 tN/yr	<ul style="list-style-type: none"> <li>Consented township expansion can occur within the limit</li> </ul>

## Appendix Two: Nitrogen Allocation Framework for farming and aquaculture

1. Management from 2016:
  - Across the Upper Waitaki Good Management Practice (GMP) for current and consented farming is required, thus allocating the current and consented load.
  - GMP loss rates are used instead of a baseline, GMP loss rates may be expressed through the Matrix of Good Management Practice or individual farm GMP.
  - Where there is headroom, (in the Haldon Arm and Lakes Aviemore/Waitaki catchments), headroom is managed by modified equal allocation for agriculture
    - All land that meets the criteria of: less than 900masl, less than 25 degree slope, is not currently irrigated or consented to irrigate; this land receives an equal allocation of the headroom
  - Headroom may be allocated to land in a sensitive lake zone, but not utilised in that area
  - In the Haldon Arm of Lake Benmore: 9% of the headroom is allocated to future aquaculture development, 9% to future township expansion, and 82% to agricultural development (based on headroom of 300t)
  - In the Ahuriri Arm gains made beyond GMP on- farm and within sub catchment, provide extra flexibility on-farm or within sub catchment
2. Implementation from 2016:
  - All resource use brought into line with the framework and moving to GMP
  - Nutrient user groups provide flexibility for sub-catchments
  - Ahuriri Land and Water group work on catchment scale mitigations
3. Catchment Stocktake 2024:
  - Check water quality outcomes are being met ahead of consents coming up for renewal
  - Quantify catchment gains in Ahuriri (and other catchments)
4. Plan review 2026:
  - Check water quality outcomes are being met
  - If water quality outcomes are met then:
    - Any catchment headroom created in the Ahuriri Arm is prioritised to less developed resource users
    - Any catchment headroom created in the Haldon Arm is allocated via modified equal allocation
  - If water quality outcomes are not being met then:
    - Investigate if the cause is local or cumulative
    - If cumulative then require reductions in losses in a way that does not punish less developed resource users

***Everything is connected***

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