



**HURUNUI**  
*District Council*



# Hurunui-Waiau Zone Committee

## Agenda

3.00pm, Monday, 15 October 2018

Hawarden Hall, Hawarden

### **Committee Membership:**

John Faulkner (Chairperson)  
Mayor Winton Dalley (Hurunui District Council)  
Cr Vince Daly (Hurunui District Council)  
Cr Cynthia Roberts (Canterbury Regional Council)  
James Costello  
Ben Ensor (Deputy Chairperson)  
Michele Hawke  
Ken Hughey  
James McCone  
Makarini Rupene (Te Ngāi Tūāhuriri Rūnanga)  
Dan Shand  
Nukuroa Tirikatene-Nash (Te Rūnanga o Kaikōura)

### **Quorum:**

The quorum of the meeting consists of:

- half of the members if the number of members (including vacancies) is even; or
- a majority of members if the number of members (including vacancies) is odd.

**Committee Secretary** – Michelle Stanley

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### **The purpose of local government:**

- (1) The purpose of local government is—
  - (a) to enable democratic local decision-making and action by, and on behalf of, communities; and
  - (b) to meet the current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions in a way that is most cost-effective for households and businesses.
- (2) In this Act, **good-quality**, in relation to local infrastructure, local public services, and performance of regulatory functions, means infrastructure, services, and performance that are —
  - (a) efficient; and
  - (b) effective; and
  - (c) appropriate to present and anticipated future circumstances.

*(Local Government Act 2002 – Amendment Act 2012)*

## HURUNUI – WAIAU ZONE COMMITTEE WORKSHOP & MEETING

**Monday, 15 October 2018**  
**Hawarden Hall, Hawarden**

**1.00pm – 2.30pm**

**Zone Committee visit to Patoa Farms**

– assemble at Hawarden Hall. All participants will be transported by bus.

### **AGENDA**

1	3.00pm	<b>Zone Committee Meeting commences</b> with karakia and formal order of business <ul style="list-style-type: none"> <li>• Apologies</li> <li>• Announced urgent business</li> <li>• Interests register (updated)</li> <li>• Confirmation of minutes – 17 September 2018</li> <li>• Matters arising: <ul style="list-style-type: none"> <li>○ Microbial and nutrient loads from birds (Ned Norton);</li> <li>○ Additional <i>E.coli</i> source studies (Ned Norton)</li> </ul> </li> </ul>	4 5-14 15-24
2	3.30pm	Update on Regional Committee Winton Dalley and Michele Hawke	
3	3.40pm	Update from Zone Committee members on activities and meetings attended that relate to the Committee's outcomes for the zone	
4	3.50pm	Public Contribution	
5	3.55pm	Update from organisations wishing to speak	
6	4.00pm	Update from Zone Delivery including 2017/18 Compliance Report <i>Marco Cataloni, Environment Canterbury</i>	
7	4.20pm	Update on BRIDGE Project – defining and managing braided river beds <i>Tania Harris, Environment Canterbury</i>	
	4.50pm	BREAK	
8	5.20pm	Update on proposed plan change to Hurunui Waiau Rivers Regional Plan <i>Lisa Jenkins, Environment Canterbury</i>	25
9	5.40pm	Committee Discussion on the proposed package for the implementation of minimum flows and environmental enhancement <i>Ken Hughey – Working Group Lead</i>	26-42
	6.30pm	Meeting concludes (approximate)	

## Register of Interests for the Hurunui-Waiau Zone Committee

Committee Member	Interests
James Costello	<ul style="list-style-type: none"> <li>• Farm owner – sheep in the Hurunui Catchment</li> <li>• Water Resource Consent to take water from the Waitohi River</li> <li>• Shareholder in Hurunui Water Project</li> <li>• Possibly an affected landowner by infrastructure of Hurunui Water Project</li> <li>• Dryland Farmers Committee member</li> </ul>
Ben Ensor	<ul style="list-style-type: none"> <li>• Land owner in the coastal hills, Jed and lower Waiau catchments.</li> <li>• Managing director of Seaward Stock Company Ltd, comprising sheep, beef and cropping enterprises.</li> <li>• Consent holder to take water for irrigation from a stream hydraulically connected to the Waiau River.</li> <li>• Member of the Hurunui Waiau Landcare Group (Dryland Farmers Group).</li> </ul>
John Faulkner	<ul style="list-style-type: none"> <li>• Dairy farm owner in the Amuri Basin.</li> <li>• Irrigation water supplied by Amuri Irrigation Company Ltd (Shareholder).</li> <li>• Dairy Support block owner, consent to take water from a gallery.</li> <li>• Member of the independent irrigators Group.</li> </ul>
Michele Hawke	Nil
Dan Shand	<ul style="list-style-type: none"> <li>• Land owner Hurunui and Waiau catchments</li> <li>• Dry land farmer</li> <li>• Member of the Hurunui/Waiau Landcare Group</li> </ul>
Mayor Winton Dalley	<ul style="list-style-type: none"> <li>• Register of Interests lies with the CEO of the Hurunui District Council.</li> </ul>
Ken Hughey	<ul style="list-style-type: none"> <li>• Professor of Environmental Management, Lincoln University (2 days per week)</li> <li>• Chief Science Advisor, Department of Conservation, Wellington (3 days per week)</li> <li>• Board member Waihora Ellesmere Trust</li> <li>• Board member Hanmer Springs Conservation Trust</li> <li>• Member Royal Forest and Bird Protection Society.</li> <li>• Member Royal Society of NZ</li> <li>• Member NZ Geographical Society.</li> <li>• Occasional contract water-related research work including for Environment Canterbury.</li> </ul>
Makarini Rupene	<ul style="list-style-type: none"> <li>• Cultural Land Management Advisor, Environment Canterbury</li> <li>• Tangata Kaitiaki</li> <li>• Ngāi Tūāhuriri Representative, Motanau Coastal Guardians</li> <li>• Member, Executive, Ngāi Tūāhuriri Runānga</li> </ul>
James McCone	<ul style="list-style-type: none"> <li>• Dry Creek Dairy Ltd- AIC Balmoral scheme</li> <li>• Kinloch Dairy Ltd- AIC Waiau Scheme</li> <li>• Amuri Irrigation Company Director</li> <li>• Committee Member Upper Waiau Independent Irrigators</li> <li>• Informal interest in potential emu plains irrigation</li> </ul>
Councillor Vince Daly	<ul style="list-style-type: none"> <li>• Farm owner - mixed cropping and livestock farm</li> <li>• Water resource consent to take water from unnamed lake in Jed catchment</li> </ul>
Cynthia Roberts	<ul style="list-style-type: none"> <li>• Register of Interests is held by Environment Canterbury.</li> </ul>
Nukuroa Tirikatene-Nash	<ul style="list-style-type: none"> <li>• Tangata Kaitiaki</li> <li>• Trustee, Te Kōhaka o Tūhaitara Trust</li> <li>• Member, Ngāi Tahu Farms Mana Whenua Working Party</li> <li>• President, Gore Bay Board Riders</li> <li>• Iwi/environmental management consultant</li> <li>• Director, Hui Ngaru o te Wai Pounamu</li> </ul>

# HURUNUI DISTRICT COUNCIL MINUTES



<b>Meeting</b>	Hurunui-Waiau Zone Committee
<b>Date and Time</b>	17 September 2018, 3.00pm
<b>Venue</b>	Rotherham Hall, Rotherham
<b>Agenda</b>	<a href="http://www.hurunui.govt.nz/assets/Uploads/17-September-2018-HWZC-Agenda.pdf">http://www.hurunui.govt.nz/assets/Uploads/17-September-2018-HWZC-Agenda.pdf</a>
<b>Members Present</b>	John Faulkner (Chair), Mayor Winton Dalley, Cr Vince Daly, Ben Ensor, Ken Hughey, James McCone, Cr Cynthia Roberts, Dan Shand and Nukuroa Tirikatene-Nash.
<b>In Attendance</b>	<p><b>Environment Canterbury (ECan)</b> – Ian Whitehouse (Zone Facilitator), Lisa Jenkins, Michael Bennett, Andrew Arps, Ned Norton, Marco Cataloni, and Cr Claire McKay.</p> <p><b>Hurunui District Landcare Group (HDLG)</b> – Josh Brown</p> <p><b>Hurunui Water Project</b> – Chris Pile and Christina Robb</p> <p><b>Amuri Irrigation Company (AIC)</b> – Andrew Barton, David Croft</p> <p><b>Plains Irrigators Ltd</b> – Neville Brightwell</p> <p><b>Department of Conservation (DOC)</b> – John Benn and Danny Kimber</p> <p><b>Te Rūnanga o Ngāi Tahu (TRONT)</b> – Lisa Mackenzie</p> <p><b>Ngāi Tahu Farming</b> – Rhys Narbey</p> <p><b>Hurunui District Council</b> – Cr Nicky Anderson</p> <p><b>Committee Secretary</b> – Michelle Stanley</p>
<b>Recording Device</b>	A recording device was in use for the accuracy of the minutes.
<b>Karakia</b>	No one was present to give the karakia.
<b>Apologies</b>	<p>James Costello and Makarini Rupene.</p> <p>Nukuroa Tirikatene-Nash for late arrival (3.04).</p> <p>THAT THE APOLOGIES BE ACCEPTED.</p> <p>Faulkner/Ensor <span style="float: right;">CARRIED</span></p>
<b>Conflict of Interest Declarations</b>	Nil.
<b>Urgent Business</b>	Nil.
<b>Health and Safety</b>	The appropriate emergency evacuation plan was outlined out at the beginning of the meeting.

**Minutes**

THAT THE MINUTES OF THE COMMITTEE MEETING HELD ON 20 AUGUST 2018 ARE CONFIRMED, SUBJECT TO THE FOLLOWING AMENDMENTS:

- Page 7, Correspondence, Paragraph 2, change the word 'sort' to 'sought'.
- Page 8, third bullet point, last sentence, change to read "This is about neutrality and arriving at the right answers and it is **up to** the Committee to ensure that it is achieving this."
- Page 9, Item 2, first bullet point, last sentence, change to read "It was noted that there are particular targets **in** the CWMS..."
- Page 11, second bullet point, remove 'per year' from the second sentence so it reads "initially the three irrigation companies (AIC, HWP and Ngāi Tahu Farms) agreed to reduce nitrogen losses by 8 tonne." And remove the end of the third sentence to read "Subsequent to those first discussions, all three companies have agreed that the 8 tonnes reduction was not conservative enough."
- Page 11, fifth bullet point, second paragraph, change 'than' to 'then' on end of first line.
- Page 12, Item 8, fifth bullet point, last sentence, change 'adverse' to 'averse'. And delete the gap between safe guards to read 'safeguards'.
- Page 12, Item 8, last paragraph, change to read, "With the discussion held and Chris Pile's statement that the three irrigator companies agree a solution needs to be fair and equitable to all, Cr Vince Daly and Nukuroa Tirikatene-Nash supported the recommendation."
- Page 14, eighth bullet point, alter the first sentence to read, "Nukuroa Tirikatene-Nash tabled a letter he received that refutes claims..." and in the last sentence add Dave's last name "...Dave Barker..."
- Page 15, Item 10, third paragraph, first bullet point, swap the words 'nitrogen limits' for 'autumn feed'.
- Page 15, Item 10, fourth paragraph, second bullet point, alter read "the Zone Committee agreed and asked that more involvement of the Zone Committee **be** actioned."

Faulkner/Hughey

CARRIED

**Matters Arising:***Microbial and nutrient Loads from birds*

Ned Norton noted that he has been unable to undertake this work but will do by the next Hurunui-Waiau Zone Committee meeting.

*Signage at Balmoral swimming hole*

Andrew Arps, ECan, noted that the signage will be looked at as part of the waterholes project.

Cr Vince Daley questioned Andrew on the swimming waterhole sign that was erected in Cheviot. All discussions prior to this sign going up were indicative that it would be a hinged sign so that when the waterhole is safe, the warning sign could be folded down. This has not happened. Andrew noted that this was a miscommunication between a change of staffing and he will look into it further.

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### *Additional E.coli source studies*

Ned Norton noted that he has been reading the various studies and has looked at the Dave Parker letter but has no further update at this time.

### *Wattles in Tutae Putaputa/Conway River Bed*

Marco Cataloni reported that there is funding available to spray the regrowth of wattles in the Conway River bed. It will take place over January and February 2019 from the State Highway 1 Bridge to the Lagoon.

### *ZIP Addendum (Page 11)*

It was discussed that if all parties do not agree to the enhancement package by the hearing date ECan will need to make a decision as to what to do next. They will keep pushing forward in the meantime.

### *Cultural Impact Assessment (Page 6)*

It was reported that Mahaanui Kurataiao Ltd (MKT) has not yet been able to find a suitable available person to undertake the cultural impact assessment of the AIC enhancement package.

It was discussed that the longer the cultural impact assessment takes, the bigger the risk of starting 2019 with the current minimum flows and not the reduced ones outlined in the enhancement package.

It was suggested that a way forward might be to look at approving the enhancement package subject to the results of the cultural impact assessment. Andrew Barton, AIC, noted that this would be worth considering as the idea of the cultural impact assessment was to fine-tune the enhancement package. He suggested looking at the broad components of the package and include a clause that states that the package is approved subject to the cultural impact assessment and AIC agree to review once the assessment has been received.

It was suggested that a meeting be set up with Nukuroa Tirikatene-Nash, Makarini Rupene, MKT and cultural advisors and the reconvened enhancement package working party to discuss this idea before the next Hurunui-Waiau Zone Committee meeting. This would be a facilitated conversation without any onus on either party to act but it would be beneficial to get an agreement in principle on a way forward.

### *Correspondence (Page 7)*

It was asked that it is preferred that the Tony Hawkers name is used when discussing the previous Zone Committee memberships as it is more respectful to the work that he put into the Zone Committee.

## **1. Update on Regional Committee**

There has not been a Regional Committee meeting since the last Zone Committee meeting. Michele Hawke noted that the working groups have met and updated the Zone Committee on the recently combined braided rivers and biodiversity health working group activities:

- A review of what is happening in the different braided rivers was given. The work in the Clarence River is continuing and they are seeing good results from the broom.
- A new island has been created in the Ashburton River for the river breeding birds

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- A study of predation in Kaikoura has been undertaken. It was noted that cats prefer the more endangered species.
  - Reports were given on the ongoing work and a commitment to continue with long-term projects.
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**2. Update from Zone Committee members on other activities and meetings attended that relate to the Committee's outcomes for the Zone.**

Updates from the following members were received:

- Ben Ensor – The meeting with Forest and Bird was held, it was an interesting, full and frank discussion. Ben noted that they left them in no doubt that the Zone Committee values their input. Forest and Bird commented that they pulled their support as they were not getting the traction that they wanted, but would consider putting people forward in the future.
- John Faulkner – The latest BRIDGE project meeting was a well-attended event. John noted that he was both frustrated and happy after the meeting. He sees it as the same as the enhancement project with opportunities to enhance landowners riparian plantings, amongst other projects, but these opportunities have not been included. It seems as if there is a disconnect between the rules and encouraging farmers to increase their biodiversity values. Whilst the project will improve the braided rivers health in the long term, there is nothing in the project for the landowners bordering the rivers. There is potential for this to be another rule-based project without the biodiversity gain.

Mayor Winton Dalley noted that there also needs to be certainty about the rules and to get a consensus on the braided river lines. Issues arise when you ask landowners to submit to lines without any rules to protect both the landowner and the rivers values. The rules will need to reflect and give clarity to what can be done in those areas.

Ken Hughey noted that he personally felt good about the meeting; there was a good turn out and mutual respect. He felt that he left with a better understanding of the values, rules and the lines. There was good discussion around the different points of views. He noted that attendees clapped at the end of the meeting.

Jamie McFadden asked the Zone Committee to consider the effect of landowners whilst the BRIDGE project is happening. He reported that ECan are still using the draft riverbed lines for consenting purposes. These lines are not public knowledge, which makes farmers nervous as to what they can and cannot do and it seems to be getting worse.

He expressed concern that ECan are still using the draft riverbed lines and running the BRIDGE project which he feels is a conflict of interest and suggests an independent facilitator for the BRIDGE project would be the best course of action. He stressed that the situation is getting worse for affected farmers.

Jamie asked that the draft riverbed lines maps be made publicly available. Whilst concern was expressed that these lines might be locked in by making them public, it was agreed that the BRIDGE project is a long-term project and something needs to be done in the meantime.

It was agreed that the Hurunui-Waiau Zone Committee request ECan to publish the flood modelling lines/draft riverbed lines on Canterbury Maps

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with an explanation that these are for information purposes and have only been provided in the interim whilst the BRIDGE project is in process.

Mayor Winton Dalley noted that the people interested in the project were aware and knowledgeable about the values that need protecting on the river. Ian Whitehouse noted that there will be more discussion on the values of the braided rivers in January.

While Ian Whitehouse noted that they are clearly marked as draft, it was disputed that they are not being used as draft lines and landowners cannot prove otherwise without spending a lot of money.

Andrew Barton, AIC, commented that it would be good for the auditing review of the Farm Plans to have the lines publicly available.

Jamie McFadden also spoke on the debate around letting the river do its thing or containing it in the stop banks. Currently this debate is being held by the BRIDGE project committee.

The impact of the BRIDGE project is not just on farmers but also for the urban landowners such as the various reserves bordering the river.

Nukuroa Tirikatene-Nash spoke on some of the concerns that the Rūnanga hold in regards to rūnanga making decisions for other rūnanga along the various rivers. It comes down to the cultural question and the different values each part of the river has for different rūnanga. He noted that they will be on the back foot in regards to a response to the BRIDGE projects questions due to the need to consult with all users of the rivers on the values, land use, environmental and/or economic perspectives.

Ian Whitehouse noted that the approach across Canterbury has been thoroughly discussed and they are at a stage where they can indicate how to make it work. All parties will be in the same situation of trying to figure out what can or cannot be done and how to deliver on values. He notes Nukuroa Tirikatene-Nash concerns and the rūnanga's resources to action this.

Discussion was held around how to make the situation better with suggestions of landowner help. It was noted that there was a very good turn out of landowners at the BRIDGE meeting and they seemed happy to be kept in the consultation process.

It was recommended that some additional marketing on what the goals of the BRIDGE project are would help to increase awareness.

Ian Whitehouse noted that from the meeting there was a very strong message to put lines on maps and then figure out what that means. All properties with a line will be consulted.

John Faulkner requested that the presentation that was given at the meeting be sent out to all the different groups and various Rūnanga.

- John Faulkner – noted that he spoke with Scott Pearson, Fish and Game, he again extended an invitation to attend future Zone Committee meetings.
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- John Faulkner – attended a Treaty of Waitangi course. He noted that it was well worth doing and encouraged other members to refresh their knowledge.
  - Ian Whitehouse – there is an overnight Hui on the on the Takahanga Marae on the 18-19 October, if wish to attend then let Ian Whitehouse or Michelle Stanley, Secretary, know.
  - Michele Hawke attended one of the Resource Management Act sessions run by Cr Peter Skelton. She noted that it was a good session and mentioned the further four sessions to come.
  - John Faulkner, Michele Hawke and others presented the ZIP Addendum to the Hurunui District Council meeting.
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**3. Public Contribution** Nil

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- 4. Update from other organisations wishing to speak** Jamie McFadden – updated the Zone Committee on the outcome of the ombudsman findings on the Fish and Game New Zealand winter fishing ban. It was found that whilst Fish and Game stated that the ban was a result of a survey undertaken, those claims could not be backed up due to there being no such survey.
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**REPORTS, SPEAKERS AND PRESENTATIONS**

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- 5. Immediate Steps Biodiversity Fund Projects**  
Biodiversity Working Group
- Cr Cynthia Roberts spoke to Jess Hills report on the four projects that are proposed for Immediate Steps funding. The Zone Committee is asked to allocate Immediate Steps funding to:
1. Mark Fitzsimmons Bush funding (\$12,035);
  2. Te Mania fence replacement (\$8,720);
  3. Beltana Bush fencing (\$13,865); and
  4. Treasure Downs wetland (\$2,740).

The Zone Committee are happy with the projects presented. There was a general query if the completed projects are audited after a period of time. Andrew Arps noted that going forward this will be included in the work schedule. He will come back to the Zone Committee with a report on how they are going to do this. It was noted that all QEII covenant projects are compulsory audited after a period of time.

THAT THE HURUNUI-WAIAU ZONE COMMITTEE ALLOCATES IMMEDIATE STEPS FUNDING TO MARK FITZSIMMONS BUSH FUNDING (\$12,035); TE MANIA FENCE REPLACEMENT (\$8,720); BELTANA BUSH FENCING (\$13,865); AND TREASURE DOWNS WETLAND (\$2,740).

Faulkner/Hawke

CARRIED

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- 6. Update from Zone Manager** Andrew Arps updated the Zone Committee on the latest activities of the Zone Team. Of special note was the news that Makarini Rupene has been appointed as the Cultural Land Management Advisor for all of North Canterbury. Andrew is aware that this will be a big area and he will be stretched so will focus on streamlining his workload.

Marco Cataloni, Zone Manager, updated the Zone Committee on the latest from the Zone Team:

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- The Hurunui Waterholes project has been renamed as 'Hurunui Splash' with the aim to have swimmable community waterholes. They are wanting to encourage energy and fun around this project. The first one to focus on will be the Balmoral. A number of different advertising will be run including utilising HDC social media platforms. The budget will include \$100,000 this year, with a further \$50,000 next year. Advice will be sought from River Engineers in order to not alter the outstanding natural character of the rivers. No facilities will be added to the areas.

It was noted that there is a trouble spot on the Hurunui River at State Highway 1, at the River Mouth, as there are no public toilets available, which can lead to other issues, such as contaminants in the water.

Another issue was raised on the amount of rubbish that is being left behind at these spots.

It was noted that the rūnanga are involved in this project.

Marco noted that this is still in the project planning stage and that all the suggestions will be taken on board.

Once the work has been completed the aim is to encourage community buy in which will keep the areas maintained and used.

Water quality monitoring will be increased.

- There has been a recent development from the planned black-backed gulls cull on the Hurunui River.

A local resident has raised concerns on the planned cull on the second biggest colony. Michael Bennett and Marco Cataloni met with the landowner to discuss his concerns and to outline why the cull is going ahead. He is against the poisoning of the birds, as it is his belief that the black-backed gulls are a part of the braided river ecosystem. It was also clear that residents are unsure if this is a full cull or a population cull.

The landowner has requested that they do not cull the second colony and that measures such as egg pricking with community input is done instead. It was noted by Zone Committee members and Department of Conservation that egg pricking is not an effective method of control and can have other effects like population dispersal and increase of egg production.

The other issue raised was that the bird's main source of food is not being dealt with. It was asked if there is a way to limit the number of birds through farming activities. It was reiterated that the black-backed gulls have been on the river for 50 years and that they will fly a long way for food but seem to prefer this part of the river as their habitat.

Some of the concern is over the misinterpretation of secondary poisoning. It was assured by Department of Conservation that the provided fact sheet on the poison to be used is over cautious and that whilst the birds die from hyperthermia; animals that might eat the birds will not be affected by secondary poisoning. All efforts will be taken to collect all of the poisoned birds.

It was noted that the *E.coli* levels in the river was not the main reason for the cull despite the data supporting the idea that the *E.coli* issues

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downstream is of avian origin. The main reason for the cull is to reduce the attacks on other nesting birds.

The Zone Committee agreed that the cull should still go ahead but asked Marco to provide the landowner with answers to his questions.

**7. Verbal update on proposed plan change to Hurunui Waiau Rivers Regional Plan**  
Lisa Jenkins, ECan.

Lisa Jenkins updated the Zone Committee on the proposed plan change to the Hurunui Waiau Rivers Regional Plan. She noted that the draft plan change is now out for consultation with statutory stakeholders. It will be taken through the Council process in October.

Discussion was held and the following was noted:

- Concern was expressed that the intention was that after the workshop the revised Section 32 plan was to come back to the Zone Committee for approval before being finalised. Lisa Jenkins apologised that this was unable to happen due to not finishing the document until the day it was due. She assured that the issues that were expressed in the workshop were addressed. She was unaware of an agreement to consult with the Hurunui District Council before submitting.
- The Zone Committee were concerned that they do not know what the final document said. Lisa to forward it on to the Zone Committee members with highlighted changes.
- The Zone Committee accepted the apology from ECan and noted its unease about the process. It was asked that next time, even if there is only a couple of hours until the deadline, to please send the final documents out.
- Jamie McFadden queried the need for the mahinga kai requirement in the Farm Environment Plans and it was discussed that this is where the future lies and that the Zone Committee has not been quiet in expressing its preference for mahinga kai to be added to the farm environment plans. Part of Makarini Rupene role as the Cultural Land Management Advisor will to be guide farmers through what is needed. Michael Bennett also assists farmers by highlighting what farmers are doing on their land that has mahinga kai values. Sometimes the farmer is unaware that they are already doing what is needed.

**Break**

*The meeting adjourned for a break at 5.16pm and reconvened at 5.25pm.*

**8. CWMS Fit for Future Project: feedback on draft 2025 and 2030 CWMS targets**

Ian Whitehouse spoke to his paper on the CWMS Fit for Future project which provided an update to the Zone Committee on the Canterbury Mayoral Forum project to ensure the Canterbury Water Management Strategy (CWMS) is fit for the future needs of the region.

The key points are:

- The CWMS Regional Committee has been asked to take a lead role in developing advice on intermediary goals (targets) for 2025 and 2030 for the 10 CWMS target areas.
- The process of developing goals for 2025 and 2030 is underway. ECan's project team is engaging with all Zone Committees on the draft goals following consideration by the Goals Working Group on 6 September.

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The Zone Committee broke up into groups and went through the CWMS fit for purpose draft goals document handed out by Ian Whitehouse. It was noted that the Zone Committee will be given another opportunity to go through this.

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## 9. Zone Facilitators Report

Ian Whitehouse,  
ECan

Ian Whitehouse spoke to his report and noted that:

- The ZIP Addendum will be recommended to ECan Councillors on Thursday, 20 September.
  - The Zone Committee was reminded about the timetable for refreshing Zone Committee community membership.
  - It was noted that Medbury Farms were a winner in the 2018 North Canterbury Business Awards.
  - Resource Management Act 101 Seminar series run by Cr Peter Skelton. Of particular interest to the Zone Committee would be:
    - Policy and plans and conservation orders – 12 September
    - Consenting - Tuesday 18 September
    - Compliance and enforcement – 25 September.
  - The next Zone Committee meeting will involve a visit to Patoa Farms.
  - Ian Whitehouse provided an indication of the number of applicants and appointments of the community memberships since the inception of the Zone Committee.
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## General Business

Discussion was held around the makeup of the Hurunui-Waiapu Zone Committee membership. John Faulkner indicated at the last meeting of the Zone Committee that he will be stepping down as chair early 2019.

James McCone raised the issue of Zone Committee membership and commented that the success of a collaborative process is a chair that understands due process and puts representation to the side to enable a robust and fair discussion. It is important for the strength of the Zone Committee that if no one is capable or willing to take the role of chairperson then one should be sought through the refresh process. Each present Zone Committee member was asked if they would consider running for chairperson and if they are staying on the Zone Committee and the following was noted:

- Nukuroa Tirikatene-Nash – whilst he is enjoying being on the committee, and will continue to do so as the Rūnanga representative, he will not stand for chair.
  - Michele Hawke – thanked John Faulkner for his outstanding commitment, years of hard work and his dedication. She will see out her term but is not interested in standing for chair.
  - James McCone – noted that he stood down as a deputy chair as he could not see himself in a chair position. He is committed to the Zone Committee.
  - Dan Shand – noted that he is still undecided about applying to be on the Zone Committee in this coming refresh and therefore will not be standing for chair.
  - Mayor Winton Dalley – noted that at the formation of the Zone Committee it was agreed that HDC and ECan Councillors and the Mayor would not stand as chair.
  - Cr Vince Daly – as a councillor representative cannot stand for chairperson.
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- Ben Ensor – noted that it is currently his intention to not stand again as a Zone Committee member as he needs a break. John Faulkner thanked him for his work and dedication to the Zone Committee.
  - Cr Cynthia Roberts – Noted her concern that so many are not re-standing.
  - Ken Hughey – noted that he has been considering whether to stand again or not, but would like to see out the process. He is not interested in standing for chair.

As it is clear that none of the remaining Zone Committee members are standing for chair it was discussed that consideration be given to the applicants who have the skillset to chair the Zone Committee. It was asked if John Faulkner would consider being a stand-in chair for a few months until a suitable replacement has had a chance to sit on the committee. John Faulkner agreed to this if needed.

It was noted that the selection panel can ask for governance and leadership experience and this can be communicated to the community. It was noted that the most effective way would be to talk to suitable people in the community.

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**Meeting concluded**      The meeting concluded at 6.34 pm

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**Next meeting**      15 October 2018 – Amberley

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**Nukuroa Tirikatene-Nash closed the meeting with a prayer**

MEETING ITEM: Matters Arising	SUBJECT MATTER: <b>Response to questions from the Zone Committee on contaminants from birds, farm animals and microbial water quality sampling in the Hurunui River</b>
AUTHOR: Ned Norton	DATE OF MEETING: 15 October 2018

### **Purpose of this paper**

The Zone Committee requested further information in response to a presentation made by Ned Norton (20 August 2018 ZC Meeting) on the results of a microbial water quality investigation at the State Highway 7 (SH7) Balmoral swimming site<sup>1</sup>. This paper addresses those requests.

### **Key messages**

- The amount of faeces (and associated faecal indicator bacteria and nutrients) excreted per animal per day differs between different bird species and farm animals. Some estimates of typical excreted amounts from the literature are provided in this paper as requested.
- The amounts of contaminants actually entering any particular waterway is a different question. In order to apply the literature excretion rates to estimate contaminant contributions to a waterway it would be necessary to understand the numbers and locations of different types of animals and the nature of attenuating conditions between the excreta and the point of interest in the waterway. It is not necessary to do this in this case because the work previously presented (20/8/18) investigated the source of microbial contamination in the Hurunui River at SH7 directly by taking samples and using lab analysis techniques such as faecal source tracking.
- None of the information presented in this paper changes the results and conclusions presented at the 20 August 2018 ZC meeting; those results and conclusions were based on the faecal source tracking method that directly confirmed birds as the dominant source of the *E. coli* contamination measured at SH7.
- The excretion rate estimates provided from the literature and estimates of the numbers of birds inhabiting the Hurunui River above SH7 can be used to estimate the load of total nitrogen (0.1 - 0.2 t/year) and total phosphorus (0.055 – 0.11 t/year) contributed by the black-backed gull colonies between Mandamus and SH7 bridge. These contributions are very small in relation to the total catchment nitrogen and phosphorus load plan limits of 963 t/year and 10.7 t/year respectively.
- On the question of whether to conduct further similar microbial monitoring downstream at the Hurunui River SH1 site, some results are provided from 2017 data showing that

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<sup>1</sup> The presentation was based on the full results, discussion and conclusions presented in a Memo dated 8 August 2018 by Jarred Arthur (Environment Canterbury) titled "*Hurunui River at State Highway 7: faecal source tracking 2017/18*", that was included in agenda papers for the Zone Committee meeting on 20 August 2018 in Amberley.

ruminant animals contributed to *E. coli* at that site with negligible contribution from birds. The merits of further work there are discussed for the Committee's consideration.

### **Relative amount of faeces per animal per day for birds versus livestock**

Zone Committee member Nukuroa Tirikatene-Nash tabled a letter at the 20 August 2018 Zone Committee meeting by Dave Barker that referenced a Fish and Game Magazine article (Issue 74, 2012) by Dr Murray Williams providing numbers on the relative food intakes from livestock and Canada geese. The numbers provided suggested 50 geese to the milking cow, 30 geese to the beef cow and about 6 geese to the 50-60kg ewe, the implication being 50 Canada geese feeding on a paddock is equivalent to having a dairy cow on the paddock in terms of intake. The letter also referenced Dairy NZ data suggesting the average dairy cow produces 25 litres of urine and 28 kg wet weight of dung per day, compared to 50 geese producing 18 kg of dung per day, the letter suggested. Nukuroa asked if the figures could be verified and what impact black-backed gulls have on water quality versus stock. In general, the figures here seem reasonable as will be shown below. Others at the meeting also asked what impact the birds may have on other contaminants such as the nutrients nitrogen and phosphorus, and the implications of these nutrients for algae growth such as nuisance *Phormidium* species.

To address these requests, I have drawn on a report commissioned by Environment Bay of Plenty titled "*First Order estimation of the nutrient and bacterial input from aquatic birds to twelve Rotorua Lakes*" (Bioresearches 2002). There are other more recent and locally relevant microbial references, particularly those published by Elaine Moriarty from ESR on faecal indicator excretion rates from a variety of birds and livestock that I will provide and discuss later in this paper. However, in the first instance I will refer to the Bioresearches (2002) reference because it provides estimates of animal excreta weights, nitrogen and phosphorus as well as faecal indicators, and because I have used this reference previously to create a spreadsheet for estimating nutrient loads from birds in the Te Waihora and Wainono catchments. This reference thus serves the initial purpose efficiently here.

I have attached tables 2 and 6 from Bioresearches (2002) (see Attachment 1) which provide a very similar estimate to that tabled by Nukuroa of 55 kg/day faeces and urine from a 635 kg dairy cow and an estimate of 50 g/day guano from a black-backed gull. These estimates suggest that one dairy cow produces the equivalent wet weight of faeces and urine to approximately 1,833 black-backed gulls.

### **Faecal indicator estimates**

For faecal indicators I first used the Bioresearches (2002) estimated  $368 \times 10^6$  faecal coliforms per gram of gull guano (page 17 of Bioresearches 2002 - not shown in the tables in Attachment 1) and  $16 \times 10^{10}$  faecal coliforms per 1000kg live animal mass per day (table 7 in Attachment 1), to calculate an estimate of  $10.2 \times 10^{10}$  faecal coliforms generated per day for a 635 kg dairy cow and  $11 \times 10^9$  faecal coliforms per day for a gull. It is notable that gulls excrete a much higher number of faecal coliforms per unit animal weight than a dairy cow, even though the cow produces much more faeces. In other words, this estimate using Bioresearches (2002) numbers from the international literature suggests that 10 gulls (0.95 kg each) produce about the same faecal coliforms per day to a single (635kg) dairy cow.

Several papers by Elaine Moriarty (ESR) and others provide more recent and locally derived (New Zealand) estimates of faecal indicator organisms excreted by livestock and birds, and also assess other aspects of human illness risk associated with excreta from these animals (e.g., Moriarty et al., 2015, 2011, 2008; Wood et al., 2018). A convenient summary for our initial purpose here is provided in a copy of table 3 from Moriarty et al., (2015) provided in Attachment 2. This shows an estimate of  $2.03 \times 10^9$  *E. coli* excreted per day per dairy cow and  $9.35 \times 10^8$  *E. coli* excreted per day per gull. In other words, this estimate suggests that 2 gulls produce about the same faecal coliforms per day to a single dairy cow. Again these numbers suggest that gulls excrete a much higher number of *E.coli* per unit animal weight than a dairy cow.

However, it is important to bear in mind that it is not as simple as this for making comparisons of illness risk between different animal sources, because although gulls excrete a higher number of *E. coli* per unit animal weight than a cow they excrete less illness-causing *Campylobacter*, as the Moriarty et al., (2015) table in Attachment 2 shows. The table in Attachment 2 shows an estimate of  $1.06 \times 10^7$  *Campylobacter* excreted per day per dairy cow and  $3.83 \times 10^4$  *Campylobacter* excreted per day per gull. In other words, this estimate suggests that 278 gulls produce about the same *Campylobacter* per day to a single dairy cow.

The comparative health risk for humans in situations where the concentration of *E. coli* in water is the same but from various animal and bird sources is described in a recent report prepared by ESR for Dairy NZ (Wood et al., 2018). A summary diagram and text from that report are shown in Attachment 3.

### **Nutrient estimates**

Bioresearches (2002) tables 7 and 10 show the estimated nutrient characteristics (loss rates) for livestock and black-backed gull excrement respectively (Attachment 1). The loss rates per gull shown in table 10 (Attachment 1) can be used in combination with estimated bird numbers and estimated proportion of time the birds spend in the riverbed (i.e., such that their faeces will enter the river).

I have used bird survey data provided by John Benn (Department of Conservation) suggesting the average black-backed gull population in the Mandamus to SH7 reach of the Hurunui River across six surveys between 2006 and 2017 is 1,297 birds, while the average population for the whole Hurunui River over the same period was 2,298 birds. Estimating the time the birds spend in the riverbed is difficult; to be conservative I have calculated an unlikely worst case based on an assumption that 100% of the gulls' excreta enters the river, and then I have calculated a more plausible estimate based on 50% of the gulls excreta entering water, which is similar to assumptions made in the Bioresearches (2002) method estimating bird contribution to Rotorua lakes. I have used these two estimates to present a possible range of nutrient load estimates contributed by black-backed gulls.

Using the above method and assumptions I have coarsely estimated the load of total nitrogen contributed by the black-backed gull colonies between Mandamus and SH7 bridge to the Hurunui River at 0.1 - 0.2 t/year and total phosphorus at 0.55 – 0.11 t/year. These load contributions are very small compared to the total catchment nitrogen and phosphorus load plan limits of 963 t/year and 10.7 t/year respectively. In my opinion these contributions are

unlikely to have an appreciable, distinguishable effect on nuisance algae such as *Phormidium*, beyond perhaps a very localised contribution to growth near dense bird colonies.

### **Further microbial water quality investigations downstream at SH1**

Zone Committee members asked if further similar microbial water quality investigations similar to those reported for SH7 could be undertaken downstream at the SH1 site. I am not sure that similar scale investigations would be cost-effective at SH1 for several reasons:

- First, the situation at SH7 is unusual in the presence of such a dominant contribution from birds and negligible contribution from ruminant animals. It took significant effort with multiple sites sampled weekly over two seasons, progressively narrowing in on the key source areas, to obtain the conclusive results presented at the 20 August Committee meeting. As described in the previous paper the sampling involves storing large quantities of river water (5L per sample) frozen, weekly, from multiple sites, for the whole summer until *E. coli* concentration results for the whole summer can be analysed to determine which samples to have sent for the expensive laboratory faecal source tracking analysis. This was justified based on visual surveys identifying the large numbers of birds and lack of other *E. coli* sources.
- By contrast the SH1 site will have multiple other likely sources from ruminant animals as several tributaries from intensively farmed land enter the Hurunui River between SH7 and SH1. While there are reportedly some bird colonies in the reach above SH1 the data from John Benn described above suggest that over half the bird population of the whole river are in the reach above SH7. It seems likely that faecal source tracking analysis will indicate multiple sources at SH1 rather than being conclusive about any single source. The results of two samples from SH1 sent for faecal source tracking analysis in 2017 showed contributions from ruminant animals but not birds (see Attachment 4).
- The results shown in Attachment 4 detected ruminant sources for up to 50% of the contamination detected but did not detect any bird contribution. This does raise the question of where the rest of the contamination is coming from. It is possible that the remainder is explained by aged ruminant sources (Jarred Arthur, Ecan, pers. comm.) but these inconclusive results are characteristically common for faecal source tracking at sites like SH1 with multiple sources.
- I think that it might be more efficient, rather than spend intensive effort at multiple sites near SH1, to instead continue with the normal regular weekly sampling for *E. coli* at the single SH1 site this summer, and in addition take and freeze a single additional bulk sample each week from that site until the end of summer. We could then look for any incidences of very high *E. coli* pulses from the weekly analysed samples and if any incidences occur send one or two of the corresponding frozen samples to the lab for faecal source analysis.
- In addition, it could be worth conducting a visual qualitative survey (by foot or kayak) down the river between SH7 and SH1 looking for relative sizes of bird colonies and other potential sources of contamination. This was a reasonably efficient way to conduct the visual survey during the previous work above SH7.

These thoughts are provided for the Committee's consideration and feedback.

## References

- Don, G.L. and Donavan, W.F. (Bioresearches) (2002). First Order Estimation of the Nutrient and Bacterial Input from Aquatic Birds to Twelve Rotorua Lakes. Report prepared for Environment Bay of Plenty, October 2002, 61p.
- Moriarty, E. M., Karki, N., Mackenzie, M., Sinton, L.W., Wood, D.R., Gilpin, B.J. (2011). Faecal indicators and pathogens in selected New Zealand waterfowl. *New Zealand Journal of Marine and Freshwater Research* 45 (4): 679-688.
- Moriarty, E. M., Downing, M., Bellamy, J., Gilpin, B.J. (2015). Concentrations of faecal coliforms, *Escherichia coli*, enterococci and *Campylobacter* spp. In equine faeces. *New Zealand Veterinary Journal* DOI:10.1080/00480169.2014.952789.
- Moriarty, E. M., Sinton, L.W., Mackenzie, M., Karki, N., Wood, D.R. (2008). A survey of enteric bacteria and protozoans in fresh bovine faeces on New Zealand dairy farms. *Journal of Applied microbiology* ISSN 1364-5072 M. 11p.
- Wood, D.R., Horn, B., Moriarty, E.M. (2018). Faecal Pollution Source Risks. ESR Client Report No. CSC18003, prepared for Dairy NZ. 19 February 2018:, 51p.

## Attachment 1: Tables copied from Bioresarches 2002

**TABLE 2 GUANO PRODUCTION PER INDIVIDUAL BIRD**

	(a) mean wt (kg)	(b) guano per day 3.2% body wt (a) (g)	(c) guano per annum (kg)	(d) time on lake % (b)	(e) guano input to lake per bird per annum (kg)
black swan	5.5	176.0	64.2	90	57.8
canada goose	4.95	158.4	57.8	70	40.5
feral goose	3.0	96.0	35.0	70	24.5
black shag	2.2	70.4	25.7	50	12.9
paradise shelduck	1.55	49.6	18.1	40	7.2
mallard	1.2	38.4	14.0	50	7.0
grey duck	1.05	33.6	12.3	50	6.2
black-backed gull	0.95	30.4	11.1	40	4.4
little black shag	0.80	25.6	9.3	50	4.7
little shag	0.70	22.4	8.2	50	4.1
caspian tern	0.70	22.4	8.2	50	4.1
scaup	0.65	20.8	7.6	90	6.8
shoveler	0.625	20.0	7.3	50	3.7
white-faced heron	0.55	17.6	6.4	50	3.2
coot	0.545	17.4	6.4	90	5.8
grey teal	0.475	15.2	5.5	50	2.8
red-billed gull	0.28	8.9	3.2	40	1.3
black-billed gull	0.275	8.8	3.2	40	1.3
dabchick	0.25	8.0	2.9	90	2.6
pied stilt	0.19	6.1	2.2	40	0.9

(a) dry weight

(b) water surface and riparian areas

**TABLE 6 LIVESTOCK FRESH MANURE CHARACTERISTICS**

MANURE SOURCE	AVERAGE ANIMAL WT	FAECES & URINE PRODUCTION		NH <sub>3</sub> -N	PHOSPHORU S P <sub>2</sub> O <sub>5</sub>
	(kg)	g/day	kg/yr	kg/tonne	kg/tonne
dairy	635	55,475	20,248	0.85	2.28
beef	362	22,000	8,030	1.74	3.26
sheep	27	1,089	398	2.59	4.19
duck	1.4	150	55	3.66	10.45

**TABLE 7 FRESH MANURE PRODUCTION AND CHARACTERISTICS PER 1000 kg LIVE ANIMAL MASS PER DAY**  
(standard deviation in brackets)

	TOTAL MANURE (kg)	BOD (kg)	COD (kg)	TKN (kg)	NH <sub>4</sub> -N (kg)	TP (kg)	FC cfu x 10 <sup>10</sup>	FS cfu x 10 <sup>10</sup>
dairy	86 (17)	1.6 (0.48)	11 (2.4)	0.45 (0.096)	0.079 (0.083)	0.094 (0.024)	16 (28)	92 (140)
beef	58 (17)	1.6 (0.75)	7.8 (2.7)	0.34 (0.073)	0.086 (0.052)	0.092 (0.027)	28 (27)	31 (45)
sheep	40 (11)	1.2 (0.47)	11 (2.5)	0.42 (0.11)	n/a	0.087 (0.030)	45 (27)	62 (73)
duck	110 (n/a)	4.5 (n/a)	27 (n/a)	1.5 (0.54)	n/a	0.54 (0.21)	180 (180)	590 (n/a)

Source References , 5 & 10

**BOD** : biochemical oxygen demand  
**COD** : chemical oxygen demand  
**TKN** : total kjeldahl nitrogen  
**n/a** : not available

**NH<sub>4</sub>-N** : total ammonia  
**TP** : total phosphorus  
**FC** : faecal coliforms  
**FS** : faecal streptococci

**TABLE 10 TOTAL NITROGEN AND TOTAL PHOSPHORUS PRODUCTION RATES (g/per day dry weight)**

Reference 6 Category	NZ species assigned	TN (g/day)	TP (g/day)
geese	feral goose, black swan, canada goose, paradise shelduck, mallard/grey, grey teal, shoveler	1.57	0.49
dabbling ducks	nil (refer text)	0.72	0.22
diving ducks	Scaup	0.61	0.19
cormorants	black shag, little black shag, little shag, caspian tern	0.89	3.87
gulls	black-backed gull, red-billed gull, black-billed gull	0.44	0.24
egrets and herons	white-faced heron	0.97	2.64
coots	Coot	0.28	0.09
muscovy ducks	Nil	0.97	0.30
grebes	dabchick, pied stilt	0.20	0.89

Notes (1) nutrient rates apply to dry weight  
 (2) nitrogen is total nitrogen  
 TN (total nitrogen) = organic N + ammonia + nitrate + nitrite  
 TKN (total kjeldahl nitrogen) = organic N + ammonia

Attachment 2: Table copied from Moriarty et al., (2015) comparing mean daily faecal bacteria excretion by various livestock and birds.

**Table 3. Estimated mean daily excretion of *Escherichia coli*, enterococci and *Campylobacter* spp. in the faeces of various livestock. All concentrations are expressed as cfu per gram of wet faeces, except for *Campylobacter* spp. in the current study where the units are most probable number per gram of wet faeces.**

Animal (reference)	Microorganisms	Concentration	Prevalence (%)	Mean daily excretion of faeces (kg/day) <sup>a</sup>	Mean daily excretion of organisms <sup>b</sup>	Mean daily excretion by 100 animals <sup>c</sup>
Horse (Current study)	<i>E. coli</i>	$4.78 \times 10^5$	98.3	12.5–21	$8.0 \times 10^8$	$7.87 \times 10^{10}$
	Enterococci	$1.01 \times 10^7$	100		$1.69 \times 10^{10}$	$1.69 \times 10^{12}$
	<i>Campylobacter</i>	13	3.4		$2.16 \times 10^5$	$7.34 \times 10^5$
Sheep (Moriarty et al. 2011b)	<i>E. coli</i>	$1.67 \times 10^7$	100	1–2	$2.51 \times 10^{10}$	$2.51 \times 10^{12}$
	Enterococci	$6.80 \times 10^5$	100		$1.02 \times 10^9$	$1.02 \times 10^{11}$
	<i>Campylobacter</i>	$2.08 \times 10^3$	30.4		$3.12 \times 10^6$	$9.48 \times 10^7$
Lambs (Moriarty et al. 2011b)	<i>E. coli</i>	$6.04 \times 10^8$	100	1–2	$9.06 \times 10^{11}$	$9.06 \times 10^{13}$
	Enterococci	$1.44 \times 10^7$	100		$2.16 \times 10^{10}$	$2.16 \times 10^{12}$
	<i>Campylobacter</i>	$3.33 \times 10^5$	80.9		$4.99 \times 10^8$	$4.04 \times 10^{10}$
Dairy Cattle (Moriarty et al. 2008)	<i>E. coli</i>	$8.2 \times 10^4$	99.05	24.8	$2.03 \times 10^9$	$2.01 \times 10^{11}$
	Enterococci	$4.5 \times 10^2$	93.3		$1.12 \times 10^7$	$1.05 \times 10^9$
	<i>Campylobacter</i>	$4.3 \times 10^2$	63.9		$1.06 \times 10^7$	$6.77 \times 10^8$
Black Swan (Moriarty et al. 2011a)	<i>E. coli</i>	$1.91 \times 10^6$	94	0.418	$7.98 \times 10^8$	$7.50 \times 10^{10}$
	Enterococci	$1.10 \times 10^6$	79		$4.59 \times 10^8$	$3.63 \times 10^{10}$
	<i>Campylobacter</i>	$2.04 \times 10^2$	45		$8.53 \times 10^4$	$3.84 \times 10^6$
Duck (Moriarty et al. 2011a)	<i>E. coli</i>	$9.4 \times 10^7$	95	0.336	$3.18 \times 10^{10}$	$3.02 \times 10^{12}$
	Enterococci	$1.01 \times 10^8$	100		$3.39 \times 10^{10}$	$3.39 \times 10^{12}$
	<i>Campylobacter</i>	$5.92 \times 10^1$	29		$1.99 \times 10^4$	$5.77 \times 10^5$
Canada Goose (Moriarty et al. 2011a)	<i>E. coli</i>	$3.62 \times 10^4$	95	0.250	$9.03 \times 10^6$	$8.57 \times 10^8$
	Enterococci	$2.51 \times 10^4$	98		$6.25 \times 10^6$	$6.13 \times 10^8$
	<i>Campylobacter</i>	$4.84 \times 10^3$	40		$1.21 \times 10^6$	$4.84 \times 10^7$
Gull (Moriarty et al. 2011a)	<i>E. coli</i>	$1.87 \times 10^7$	96	0.05	$9.35 \times 10^8$	$8.98 \times 10^{10}$
	Enterococci	$8.96 \times 10^6$	99		$4.45 \times 10^8$	$4.41 \times 10^{10}$
	<i>Campylobacter</i>	$7.66 \times 10^2$	59		$3.83 \times 10^4$	$2.26 \times 10^6$

<sup>a</sup> Based on data from: Lawrence et al. (2003a) (horse); Moriarty et al. (2011a) (sheep); Muirhead et al. (2011) (dairy cattle); Mitchell and Wass (1995) (Black swan); Geldreich (1966) (duck); Hussong et al. (1979) (Canada goose); Wood and Trust (1972) (Gull).

<sup>b</sup> Estimated from daily excretion volume  $\times$  mean concentration of organism for a positive animals.

<sup>c</sup> Estimated from mean daily output of organisms for a positive animal  $\times$  prevalence.

Attachment 3: Diagram and text copied from the Executive Summary of Wood et al., (2018) summarising the comparative health risk given the same concentration of the indicator *E. coli* for various livestock and birds.

The risk model outputs indicated a trend of increasing risk with increasing concentration of indicator (*E. coli*). The results also showed that the risk from different sources were not the same, when comparing the situation with the same concentration of indicator in the water. A general comparison of sources and their risk is shown below.

**Comparative risk. Which sources represent a higher and lower risk to health when the indicator concentration in the water is the same?**



## Attachment 4: Environment Canterbury sampling and Faecal Source Tracking lab results for Hurunui River at SH1

Site	Date	E. coli (MPN/100mL)	General GenBac/ 100 ml	Human BacH / 100 ml	Human BiADO /100 ml	Ruminant BacR /100 ml	Proportion Ruminant	Avian GFD /100 ml	Conclusion
Hurunui SH1	8/02/2017	313	8100	ND	ND	140	10 - 50%	detected <LOQ	Ruminant source (10-50%)
Hurunui SH1	15/03/2017	299	3500	ND	ND	76	10 - 50%	ND	Ruminant source (10-50%)

MEETING ITEM: 8	SUBJECT MATTER:  <b>Update on the Plan Change process for fixing the 10% rule</b>
AUTHOR: Lisa Jenkins	DATE OF MEETING: 15 October 2018

### **Zone Implementation Programme addendum**

At the Regional Council's September 20 meeting, John and Michelle presented the Zone Committee's recommendations to the Council. The Council received the recommendations and directed Environment Canterbury staff to report back to them on how those recommendations can be implemented.

Regional Councillors were briefed on a draft Plan Change to fix the 10% rule on 11 October.

### **Schedule 1 consultation**

A draft Plan Change and section 32 report was circulated to stakeholders in September

- Written feedback was received from 8 parties: Hurunui District Landcare Group, Hurunui District Council, Rural Advocacy Network, Federated Farmers, Amuri Irrigation, Beef & Lamb, Fish & Game and Forest & Bird.
- Feedback was varied, in summary:
  - The majority of feedback was supportive of the direction of the Plan Change
  - Two submitters opposed the plan change due to concerns around the ability for water quality to be maintained and concerns with the process itself.
  - There were suggestions made to extend the scope of the Plan Change to cover additional matters including the differing attenuation rates for dryland and irrigated land and better enabling tributary pumping.
  - The majority of requests for specific wording changes were in relation to Management Plan content.

An additional Zone Committee workshop will be scheduled to consider changes to the draft plan change in response to feedback.

A further outcome from the 1<sup>st</sup> schedule feedback was a request from Mahaanui Kurataiao to Environment Canterbury to hold off notifying the Plan Change until Rūnanga have had adequate time to understand the implications of the Plan Change and the related pieces of work, including the flows package. Environment Canterbury have agreed to work with Mahaanui Kurataiao to ensure Rūnanga are fully informed before the plan change is notified. This will also provide an opportunity to identify the appropriate mechanism to offset N load in the Hurunui.

MEETING ITEM: 9	SUBJECT MATTER:  <b>Implementation of minimum flows – update from working party and next steps</b>
AUTHOR: Ken Hughey – Chair of the working party	DATE OF MEETING: 15 October 2018

### Introduction

The working party (Ken, Nukuroa, Makarini, John and Ben with Andrew and Bianca from AIC) met on 28 September to discuss options for advancing the discussion on the minimum flows and environmental enhancement package. Notes from that meeting are attached. Also attached are a copy of the package in its current form and a description of the governance arrangements agreed to for the implementation of the package.

### Action required

Zone Committee members are asked to consider the package in its current form and indicate if they:

1. Support delay of the package progression until the implications of the Cultural Impact Assessment are understood and considered; and
2. Support the existing intent and components of the package, including the financial envelope of the package noting there could be some re-weighting to address matters identified in the Cultural Impact Assessment. Note, consensus is not sought on this point today.

If individual committee members support the matters above, it is recommended that the Zone Committee ask AIC, as a sign of good faith, to voluntarily increase minimum flows in the Waiau Uwha River by 1 cumec in the 2018/2019 irrigation year as envisioned in the package.

**Meeting of the Working Party (Ken, Nukuroa, Makarini, John and Ben with Andrew and Bianca from AIC), 28 Sept 2018, Amberley 1-2.20pm.**

Ken started the hui with a mihi and set the context. The discussion that followed was long, important, deep and meaningful, philosophical and applied – in all it demonstrated the strengthening of good faith relationships.

Two pieces of context are very important:

- AIC and Nukuoro and Makarini have met 2x and developed a draft set of the ongoing institutional arrangements around governance and implementation of the package. We talked this through and we all welcome the initiative (It is attached as Appendix 1)
- ECan, on behalf of the runanga, have contracted MKT to undertake the CIA – it will be completed by February 2019.

The above, especially the latter then became the focus of discussion. Again, in all good faith we cannot fully progress the package until the CIA is completed and its implications considered. But, given this understanding we nevertheless reached the following positions:

- The components and togetherness of the package are understood and supported (noting the salmon passage component needs to be retitled something like improved fish passage for overall fisheries benefit).
- The financial limit of the package envelope is fixed but there is room for some reweighting inside the package – such could occur as a result of the CIA and any implications.
- Despite the fact we cannot proceed to implement the package now it was agreed, in principle, that increasing the minimum flows in the Waiau (1 cumec) as envisaged would be an important good faith initiative on behalf of AIC.

To progress the above we agreed the following:

- To support delay of package progression until the implications of the CIA are understood and properly considered, but within the existing financial envelope
- To seek support from individual members of the Zone Committee, excluding runanga reps (because the CIA is under preparation), for the existing intent and components of the package, to be discussed in full at the October meeting. Support from individuals does not constitute a ZC approval because a consensus cannot be reached before the CIA has been received and considered.
- Consequent on the outcome of the above to seek approval from AIC to have the Waiau minimum flows voluntarily increased in 2019 as envisaged in the package.

We closed the meeting with very positive reflections and learnings and with a 'prayer' from Nukuroa.

Ken Hughey

Chair of the Working Party

## Proposed staged minimum flow and environmental enhancement package

### Introduction

Amuri Irrigation Company (AIC) have resource consents with lower minimum flows than those in the Hurunui and Waiau River Regional Plan (HWRRP) and have requested that full implementation of the HWRRP minimum flows be delayed until water storage is established. The Zone Committee established a Working Party, who have met regularly with AIC to understand the implications of the lower minimum flows and seek a way forward. Options considered included:

- Mitigation to offset the lower minimum flows;
- A staged approach to increasing minimum flows;
- Formal review of AIC's consents to implement the HWRRP minimum flows; or
- Some combination of the above.

### The proposed package

AIC initially proposed a range of projects to offset the potential effects of the current consent minimum flows continuing, as presented to the Zone Committee at its 20 November 2017 meeting. These have been further developed by the Working Party and AIC, along with staged increases to the Hurunui and Waiau River minimum flows. The proposed package is now comprised of two components:

1. Staged increases to minimum flows in the Hurunui and Waiau Rivers.
2. A range of mitigation and environmental enhancement projects designed to address the effects of lower minimum flows; and

While one project can be considered as business as usual for AIC, the balance are either new enhancement projects or have been accelerated as part of this package. Business as usual is defined as being within the current budgeted scheme operations or required by conditions of AIC's resource consents; accelerated projects are those that are likely to be offered by AIC as mitigation, or required by Environment Canterbury, when AIC's consents are replaced in 2033; and enhancement projects are those that AIC would be otherwise unlikely to undertake.

The timing, expenditure and nature of the environmental mitigation and enhancement projects are summarised in Table 1 below. The expenditure figures are limited to direct costs to AIC and do not include costs to farmers, e.g. soil moisture measurement, wetland enhancement. The projects are budgeted until 2025-26 when the HWRRP minimum flow regime will be fully implemented. Continuation of projects beyond this will be at AIC's discretion.

The components of the package are presented in detail on the following pages. Following this, the proposed mitigation projects are evaluated against the relevant targets of the Canterbury Water Management Strategy (CWMS).

**Table 1: Summary of the mitigation and environmental enhancement projects**

Project	Project status	2018-20	2020-22	2022-24	2024-26	Total
1. Staged increases to minimum flows	Accelerated	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>
2. Enhancing cultural knowledge and mahinga kai values	Enhancement	\$50,000	\$60,000	\$75,000	\$75,000	<b>\$260,000</b>
3. Improving Hurunui and Waiau River hapua	Enhancement	\$19,500	\$46,000	\$38,000	\$26,000	<b>\$129,500</b>
4. Enhancing spring-fed streams	Enhancement	\$5,000	\$20,000	\$20,000		<b>\$45,000</b>
5. Enhance riverbed bird habitat	Enhancement	\$43,000	\$76,000	\$76,000	\$76,000	<b>\$271,000</b>
6. Wetland enhancement	Enhancement		\$15,000	\$115,000	\$20,000	<b>\$150,000</b>
7. Reducing nitrogen inputs to Hurunui and Waiau Rivers	Enhancement	\$1,700,000	\$190,000	\$190,000	\$190,000	<b>\$2,270,000</b>
8. Mitigate the risk of adverse impact on salmon passage	Accelerated	\$5,000	\$20,000	\$30,000	\$50,000	<b>\$105,000</b>
9. Soil moisture monitoring	Accelerated	\$0 <sup>2</sup>	\$0 <sup>2</sup>	\$0 <sup>2</sup>	\$0 <sup>2</sup>	\$0 <sup>2</sup>
10. Public access	Enhancement	\$5000				<b>\$5000</b>
11. Managed aquifer recharge trial	Enhancement	\$20000	\$100000	\$5000	\$5000	<b>\$130000</b>
12. Hydro-electricity generation	Business as usual	-	-	-	-	-
<b>TOTAL</b>		<b>\$1842500</b>	<b>\$527000</b>	<b>\$454000</b>	<b>\$442000</b>	<b>\$3265500</b>

<sup>1</sup> Costs are not able to be assigned to the staged increases to minimum flows, as these will depend on the future climate.

<sup>2</sup> Soil moisture monitoring would be a direct cost to the shareholder farmers, rather than AIC. The costs are estimated to be an average of \$10,000 per farm, with the minimum irrigable area and timeframes still to be finalised.

## 1. Staged increases to minimum flows

The conditions of AIC's resource consents are not consistent with the minimum flows in the HWRRP.

- For the Waiau River, consented minimum flows for the Waiau Irrigation Scheme in February and March are 15 m<sup>3</sup>/s, with 20 m<sup>3</sup>/s specified in the HWRRP. For other months, the consented minimum flows are either consistent with, or higher than the HWRRP.
- For the Hurunui River, consented minimum flows for the Balmoral Irrigation Scheme in December are 13.5 m<sup>3</sup>/s, with 15 m<sup>3</sup>/s specified in the HWRRP. For January to April, the consented minimum flow is 12 m<sup>3</sup>/s, with a 15 m<sup>3</sup>/s minimum flow specified in the HWRRP. For other months, the consented minimum flows are either consistent with, or higher than the HWRRP.

Without either Environment Canterbury reviewing the resource consents, or AIC voluntarily changing the resource consent conditions, these minimum flows would remain until the resource consents expire in 2033.

Project outline:

- The consented minimum flows will increase in stages, as shown in Table 1, with the HWRRP minimum flow regime being fully implemented by 2025-26.
- AIC will apply to change the conditions of their resource consents to implement the staged increases to the consented minimum flows.

**Table 1:** Proposed staged increases to minimum flows

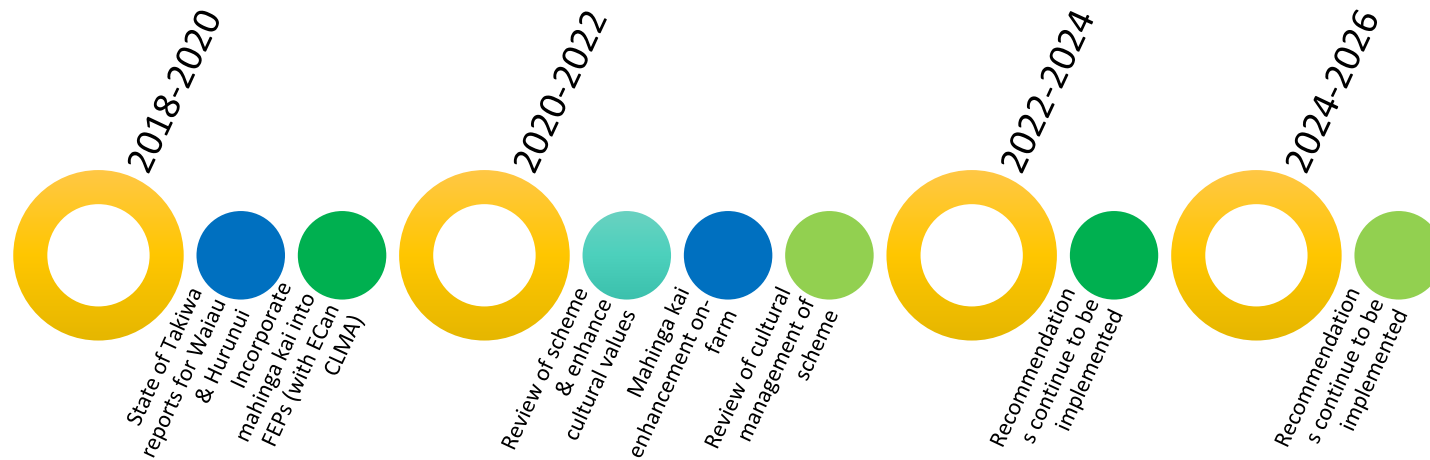
Season	Waiau Irrigation Scheme	Balmoral Irrigation Scheme
	Minimum flow (m <sup>3</sup> /s) <sup>1</sup>	Minimum flow (m <sup>3</sup> /s) <sup>1</sup>
2018-19	16	13
2019-20	16	13
2020-21	16	13
2021-22	16	13
2022-23	18	13
2023-24	20	13
2024-25	20	13
2025-26	20	15

NOTES: 1. These minimum flows are for February and March for the Waiau River, and January to April for the Hurunui River. Consented minimum flows for other months are consistent with or higher than the HWRRP minimum flows.  
2. The consented partial restriction regime will remain until the HWRRP minimum flows are implemented in 2025-26.

## 2. Enhancing cultural knowledge and mahinga kai values

Project outline:

- AIC to fund State of the Takiwa reports for the Hurunui and Waiau catchments.
- This work will include a cultural review of the scheme (but exclude the mixing of waters between catchments) and recommendations for how AIC can improve cultural values within its scheme area, particularly improving the mauri of waterbodies and enhancing mahinga kai. These will be implemented with the assistance of ECan's Cultural Land Management Advisor and in partnership with Rūnanga.



### Costs

	2018-2020	2020-2022	2022-2024	2024-2026	
State of Takiwa reports	\$50,000				
Cultural review of scheme		\$35,000			
Deliver on-farm recommendations		\$10,000	\$30,000 <sup>1</sup>	\$30,000	
Deliver scheme recommendations		\$15,000	\$45,000	\$45,000	
<b>TOTAL</b>	<b>\$50,000</b>	<b>\$60,000</b>	<b>\$75,000</b>	<b>\$75,000</b>	<b>\$260,000</b>

### 3. Improving Hurunui and Waiau River hapua

Project outline:

- Develop and implement Action Strategies for the Waiau and Hurunui River hapua. AIC to organise initial workshops and offer to drive project.
- Monitor the Hurunui River hapua geomorphology, continuing the monitoring established by Richard Measures (NIWA) in June 2015.
- Monitor the Hurunui River hapua water quality. Note that ECan installed a dissolved oxygen logger in December 2017.
- Initiate monitoring of the Waiau River hapua, including capital expenditure to purchase monitoring equipment.



#### Costs

	2018-2020	2020-2022	2022-2024	2024-2026	
Hurunui River Hapua Action Strategy preparation	\$12,000 <sup>1</sup>				
Waiau River Hapua Action Strategy preparation			\$12,000 <sup>1</sup>		
Hurunui River Hapua Action Strategy implementation		\$15,000	\$15,000		
Waiau River Hapua Action Strategy implementation				\$15,000	
Hurunui River hapua monitoring	\$7,500	\$5,000	\$5,000	\$5,000	
Waiau River hapua monitoring <sup>2</sup>		\$26,000	\$6,000	\$6,000	
<b>TOTAL</b>	<b>\$19,500</b>	<b>\$46,000</b>	<b>\$38,000</b>	<b>\$26,000</b>	<b>\$129,500</b>

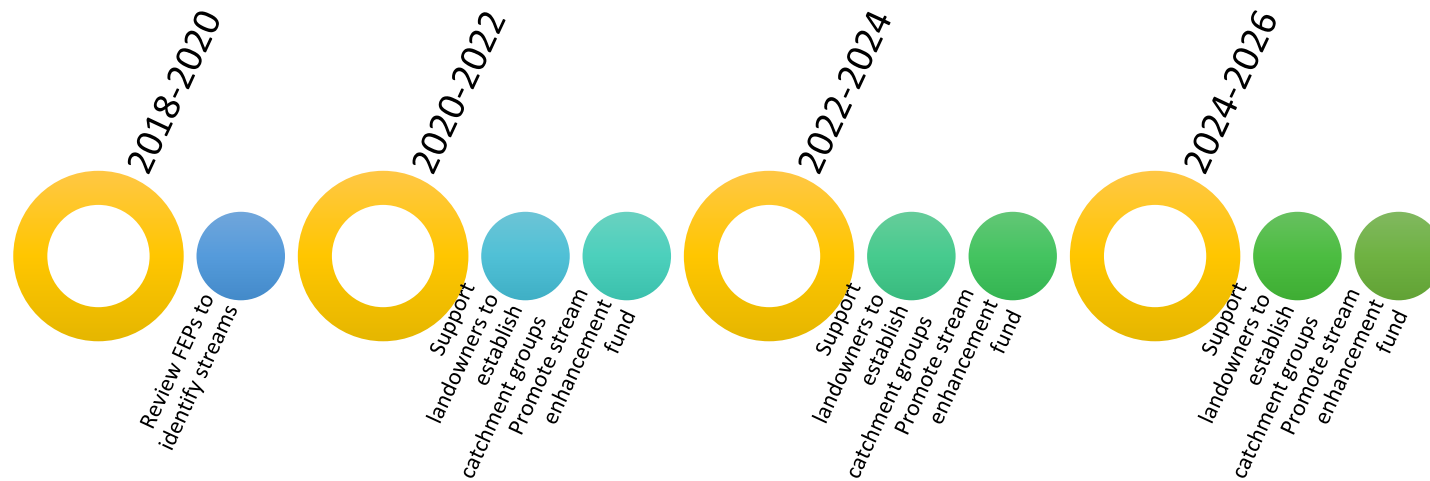
<sup>1</sup> based on 1 person 3-4 days a month for 4 months

<sup>2</sup> CAPEX of \$10,000 to purchase equipment and \$10,000 to install. Ongoing costs are higher as access is only by jetboat.

#### 4. Improving spring-fed streams

Project outline:

- Review Farm Environment Plans to identify streams that would benefit from enhancement.
- Support landowners to establish catchment groups.
- Initiate and promote fund to improve ecological, recreational and cultural values, e.g fencing, planting.



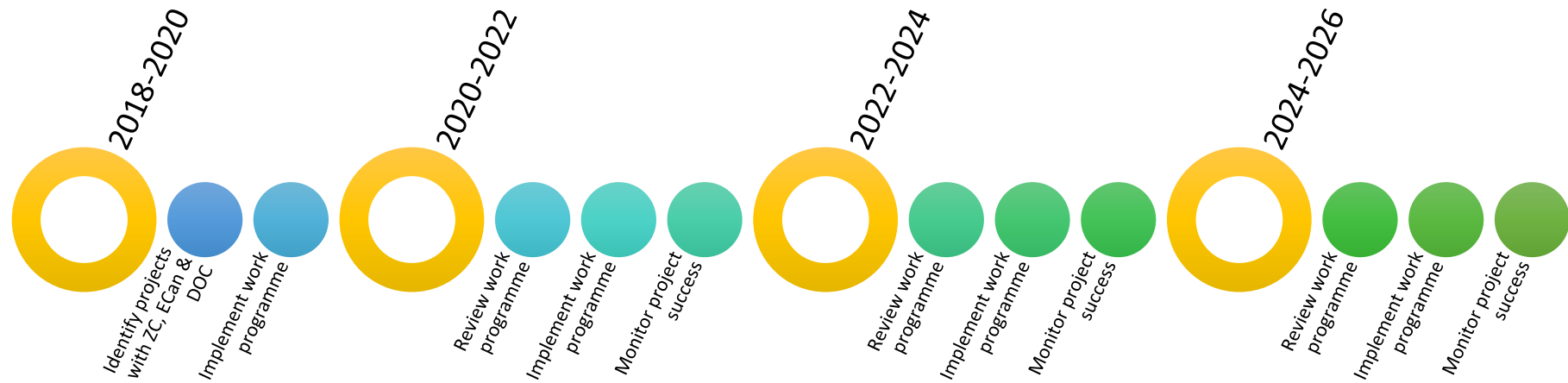
#### Costs

	2018-2020	2020-2022	2022-2024	2024-2026	
Review FEPs to identify streams	\$5,000				
Catchment group support		\$5,000	\$5,000		
Enhancement fund		\$15,000	\$15,000		
<b>TOTAL</b>	<b>\$5,000</b>	<b>\$20,000</b>	<b>\$20,000</b>		<b>\$45,000</b>

## 5. Improving braided river bird habitat

Project outline:

- Work with Zone Committee, ECan and DOC to identify projects to complement Immediate Steps work, e.g. continued maintenance of braided river islands, weed control and predator control adjacent to constructed islands.
- Allocate funds for habitat enhancement projects. More funds are allocated from 2022, when Immediate Steps funding finishes.
- Undertake project monitoring, e.g. replicated index counts as a baseline and every 5 years.
- Promote involvement of landowners adjacent to project sites to ensure farm management practices along braided river edges are sympathetic to braided river values.



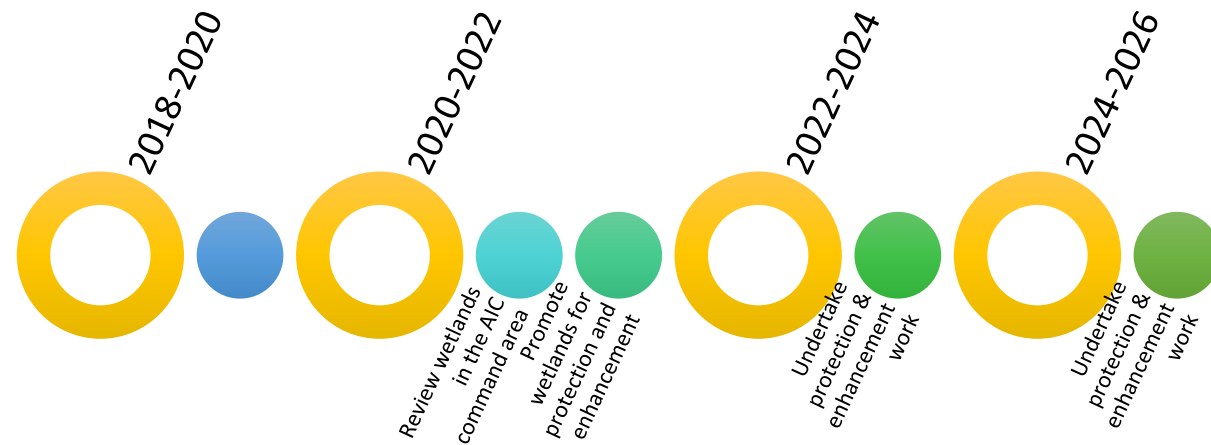
### Costs

	2018-2020	2020-2022	2022-2024	2024-2026	
Identify and scope projects	\$5,000				
Undertake enhancement work programme	\$30,000	\$60,000	\$60,000	\$60,000	
Project monitoring (\$5,000/yr)	\$5,000	\$10,000	\$10,000	\$10,000	
Annual work programme review (\$3,000/yr)	\$3,000	\$6,000	\$6,000	\$6,000	
<b>TOTAL</b>	<b>\$43,000</b>	<b>\$76,000</b>	<b>\$76,000</b>	<b>\$76,000</b>	<b>\$271,000</b>

## 6. Wetland enhancement

Project outline:

- Construction of a wetland in the Pahau Drain to enhance ecological values and improve water quality.
- Review existing wetlands in the AIC command area through FEPs and make recommendations for protection and enhancement.
- Promote the benefits of protection and enhancement work to landowners, e.g fencing, planting, hydrological enhancement.



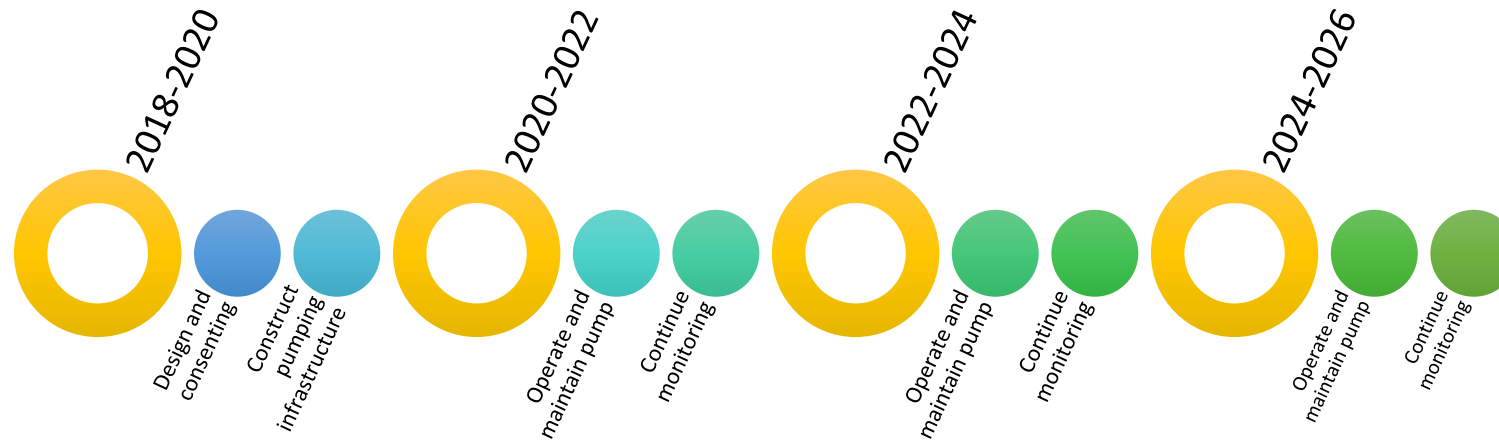
### Costs

	2018-2020	2020-2022	2022-2024	2024-2026	
Review of wetlands in AIC command area		\$10,000			
Promote wetland restoration		\$5,000			
Undertake protection and enhancement work			\$15,000	\$20,000	
Pahau Drain wetland			\$100,000		
<b>TOTAL</b>		<b>\$15,000</b>	<b>\$115,000</b>	<b>\$20,000</b>	<b>\$150,000</b>

## 7. Reducing nitrogen inputs to Hurunui and Waiau Rivers

Project outline:

- Undertake design work and obtain resource consents to pump water from St Leonards and Lowry Drains for re-use on neighbouring farm land and/or via the main AIC pipelines.
- Construct, operate and maintain pump infrastructure.  
Note that the nitrogen reductions from this project may in part be used to offset the additional load anticipated to come from dry land farming through the upcoming Plan Change



### Costs

	2018-2020	2020-2022	2022-2024	2024-2026	
Design and consenting	\$50,000				
Capital expenditure on pumping infrastructure	\$1,500,000				
Project management	\$150,000				
Maintenance & operation		\$50,000	\$50,000	\$50,000	
Debt servicing (\$70,000/yr)		\$140,000	\$140,000	\$140,000	
<b>TOTAL</b>	<b>\$1,700,000</b>	<b>\$190,000</b>	<b>\$190,000</b>	<b>\$190,000</b>	<b>\$2,270,000</b>

## 8. Mitigating the risk of adverse impact on salmon passage

Project outline:

- Explore options with Fish and Game New Zealand to enhance salmon numbers. This could include enhancing spawning habitat, smolt releases, bywash management, or reducing the rate taken at a critical period to support salmon passage.
- Undertake agreed measures.
- Review Waiau River fish screen configuration



### Costs

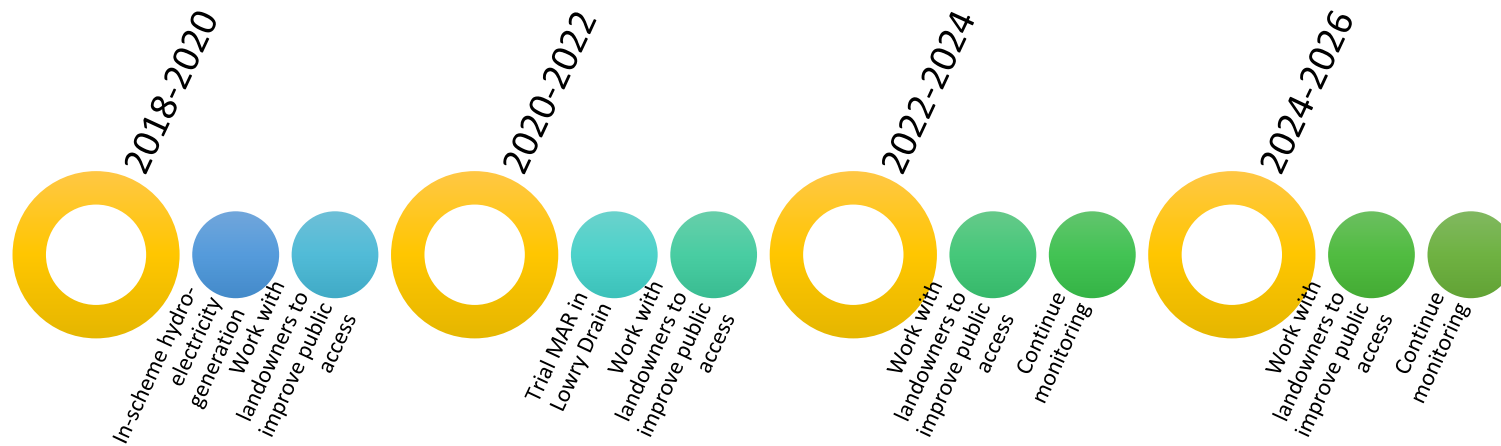
	2018-2020	2020-2022	2022-2024	2024-2026	
Identify options with F&G	\$5,000				
Implement agreed measure to increase salmon numbers <sup>1</sup>		\$20,000			
Review Waiau River fish screen			\$30,000		
Implement recommendations from fish screen review				\$50,000	
<b>TOTAL</b>	<b>\$5,000</b>	<b>\$20,000</b>	<b>\$30,000</b>	<b>\$50,000</b>	<b>\$105,000</b>

<sup>1</sup> This does not consider provision for reducing the rate taken for short periods flows, which could result in a substantial cost.

## 9. Other projects

Other projects include:

- Continue to investigate incorporating hydro-electricity generation into the AIC scheme, aiming for construction in 2019/20. This includes discussions with electricity distribution networks, design, consenting and construction. This will provide dilution through tributary stream augmentation.
- Trial managed aquifer recharge in the Lowry Drain.
- Implement an on-farm soil moisture monitoring programme.
- Advocate with landowners to improve public access.



### Costs

	2018-2020	2020-2022	2022-2024	2024-2026	Total
Hydro-electricity generation <sup>1</sup>					
Managed aquifer recharge	\$20000	\$100000	\$5000	\$5000	\$130000
Soil moisture monitoring	\$0 <sup>2</sup>	\$0 <sup>2</sup>	\$0 <sup>2</sup>	\$0 <sup>2</sup>	\$0 <sup>2</sup>
Public access	\$5000				\$5000
<b>TOTAL</b>	<b>\$25,000</b>	<b>\$100,000</b>	<b>\$5,000</b>	<b>\$5,000</b>	<b>\$135,000</b>

<sup>1</sup> Hydropower generation will create a positive return so costs not included

<sup>2</sup> Soil moisture monitoring would be a direct cost to the shareholder farmers, rather than AIC. The costs are estimated to be an average of \$10,000 per farm, with the minimum irrigable area and timeframes still to be finalised.

## Alignment of the mitigation package with CWMS targets

The Canterbury Water Management Strategy sets out 10 broad target areas:

1. Environmental Limits
2. Ecosystem Health and Biodiversity
3. Natural Character of Braided Rivers
4. Kaitiakitanga
5. Drinking Water
6. Recreational and Amenity Opportunities
7. Water-use Efficiency
8. Irrigated Land Area
9. Energy Security and Efficiency
10. Indicators of Regional and National Economies

Relevant to the work of the Working Party, the Environmental Limits target sets the following specific target (Target 3) for 2020: *“Established and begun to implement a programme to review existing consents where such review is necessary in order to achieve catchment load limits”*. Also, the Irrigated Land Area target for infrastructure states that by 2020 *“Started construction of regional storage and improved reliability of supply for at least 50% of irrigated land”* and *“started construction of infrastructure identified in zonal implementation programmes”*. The work of the Working Party is contributing towards achieving these targets.

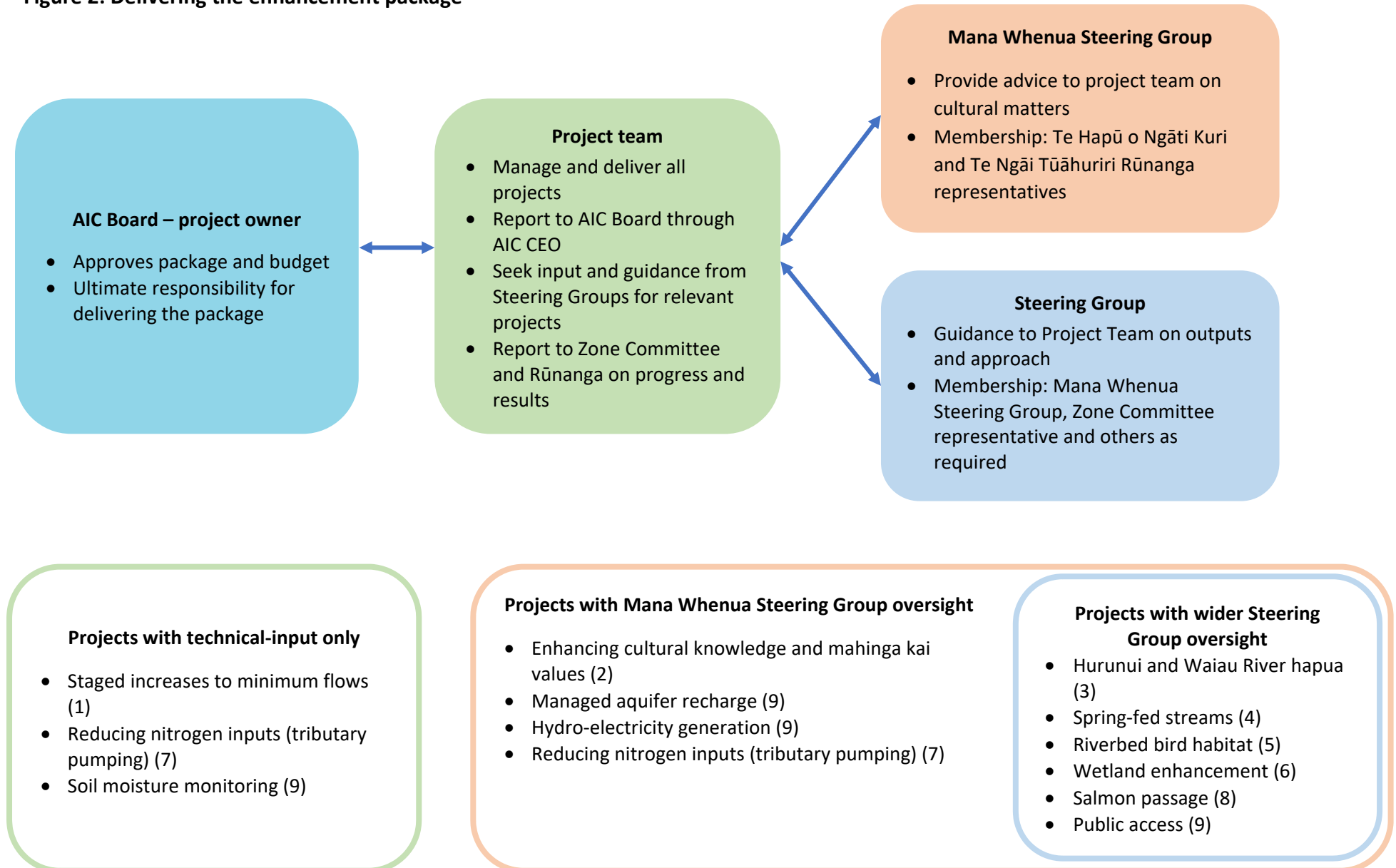
## Evaluation of the mitigation projects against the CWMS targets

The table below presents the relevant CWMS target(s) for each of the proposed mitigation projects. For each, a rating is given which indicates the extent to which the project contributes towards achieving the target. A rating of 1 means that it has a low contribution and/or is expected through consent conditions. A rating of 3 means that the project is making a significant contribution to the target over and above what would otherwise be expected of AIC.

Proposed mitigation	Business as usual or enhancement?	Key CWMS target(s)	Contribution (low=1, high=3)
1. Staged increases to minimum flows	Accelerated	<i>Environmental limits</i> , Target 3: By 2020 established and begun to implement a programme to review existing consents where such review is necessary in order to achieve catchment load limits.	3
2. Improving Hurunui and Waiau River hapua	Enhancement	<i>Ecosystem health and biodiversity</i> , hapua, lagoons and estuaries targets especially Target 2 (by 2020): A significant protection and restoration programme is in place on the most ecologically significant river mouth or coastal lagoon in each management zone.	3
3. Enhancing spring-fed streams	Enhancement	<i>Ecosystem health and biodiversity</i> , lowland streams & lakes target by 2020: Improve condition and water quality in at least 60% of lowland streams and 60% of lowland lakes in each zone.	2
4. Enhance riverbed bird habitat	Enhancement	<i>Natural character of braided rivers</i> , ecosystems, habitats and species/riparian wetlands, springs and lagoons targets: From 2010: Implement actions to correct the decline in usable braided river bird habitat. By 2015: Enhance and protect breeding populations of indigenous braided river birds.	3
5. Delivering mahinga kai values	Enhancement	Wāhi taonga & mahinga kai, especially Target 3 (identified customary uses (current and potentially restored) for all waterways) & Target 6 (increase the abundance of, access to and use of mahinga kai)	3
6. Wetland enhancement	Enhancement	<i>Ecosystem health and biodiversity</i> , wetlands target by 2020: Protected all wetlands	2
7. Reducing nitrogen inputs to Hurunui and Waiau Rivers	Enhancement	<i>Recreational and Amenity Opportunities</i> , Recreational water quality target by 2020: of the lake and river sites used for contact recreation, an increase in the percentage that meet recreational water quality guidelines	2
8. Mitigate the risk of adverse impact on salmon passage	Enhancement	<i>Ecosystem health and biodiversity</i> , Freshwater species & their habitat from 2010 Target 1: No further reduction in the number and areas of existing salmon spawning sites.	2
9. Soil moisture monitoring	Accelerated	<i>Water-use Efficiency</i> targets, especially by 2020 eighty percent of water used for irrigation and stockwater is operating according to best practice water use.	3

10. Public access	BAU	<i>Recreational and Amenity Opportunities</i> Water based recreational opportunities, by 2015/2020: A positive trend in the availability and/or quality of recreational opportunities in each zone.	2
11. Managed aquifer recharge trial	Enhancement	<i>Drinking water, source water quality</i> Target 4 by 2020: A demonstrable decrease in nitrate concentrations in shallow groundwater in priority areas is achieved.	2
12. Hydro-electricity generation	BAU	<i>Energy Security and Efficiency, Target 1:</i> Generate at least 40-45% of the power used by irrigation in Canterbury from irrigation infrastructure (including multi-use hydro and irrigation systems) within Canterbury and other renewable on-farm sources.	3

Figure 2: Delivering the enhancement package



# Hurunui Waiau Zone Water Management Committee

## Terms of Reference

The area of the Hurunui Waiau Water Management Zone is shown on the attached map.

### Establishment

The Committee is established under the auspices of the Local Government Act 2002 in accordance with the Canterbury Water Management Strategy 2009.

The Committee is a joint Committee of Environment Canterbury (the Regional Council) and Hurunui District Council (the Territorial Authority).

### Purpose and Functions

The purpose and function of the Committee is to:

- Facilitate community involvement in the development, implementation, review and updating of a Zone Implementation Programme that gives effect to the Canterbury Water Management Strategy in the Hurunui Waiau area; and
- Monitor progress of the implementation of the Zone Implementation Programme.

### Objectives

- 1) Develop a Zone Implementation Programme that seeks to advance the CWMS vision, principles, and targets in the Hurunui Waiau Zone.
- 2) Oversee the delivery of the Zone Implementation Programme.
- 3) Support other Zone Implementation Programmes and the Regional Implementation Programme to the extent they have common areas of interest or interface.
- 4) Ensure that the community of the Zone are informed, have opportunity for input, and are involved in the development and delivery of the Hurunui Waiau Implementation Programme.
- 5) Consult with other Zone Water Management Committees throughout the development and implementation of the Hurunui Waiau Implementation Programme on matters impacting on other zone areas.
- 6) Engage with relevant stakeholders throughout the development of the Hurunui Waiau Implementation Programme.
- 7) Recommend the Hurunui Waiau Implementation Programme to their respective Councils.
- 8) Review the Implementation Programme on a three yearly cycle and recommend any changes to the respective Councils.
- 9) Monitor the performance of Environment Canterbury, Hurunui District Council, and other agencies in relation to the implementation of the Hurunui Waiau Implementation Programme.
- 10) Provide Environment Canterbury and Hurunui District Council with updates on progress against the Zone Implementation Programme.

### **Limitation of Powers**

The Committee does not have the authority to commit any Council to any path or expenditure and its recommendations do not compromise the Councils' freedom to deliberate and make decisions.

The Committee does not have the authority to submit on proposed Resource Management or Local Government Plans.

The Committee does not have the authority to submit on resource consent matters.

### **Committee Membership**

The Zone Committee will comprise:

- 1) One elected member or Commissioner appointed by Environment Canterbury;
- 2) One elected member appointed by each Territorial Authority operating within the Zone Boundary;
- 3) One member from each of Tūāhuriri and Kaikōura Rūnanga;
- 4) Between 4-7 members appointed from the community and who come from a range of backgrounds and interests within the community;
- 5) Environment Canterbury and Hurunui District Council will appoint their own representatives on the Committee. Tūāhuriri and Kaikōura Rūnanga will nominate their representatives and the appointments will be confirmed by Environment Canterbury and Hurunui District Council.

### **Selection of Community Members**

To be eligible for appointment to a Zone Committee the candidate must either live in or have a significant relationship with the zone. Recommendations on Community Members for the Hurunui Waiau Zone Committee will be made to Environment Canterbury and Hurunui District Council by a working group of representatives from Environment Canterbury, Hurunui District Council, Tūāhuriri and Kaikōura Rūnanga. The recommendations will take into account the balance of interests required for Hurunui Waiau, geographic spread of members and the ability of the applicants to work in a collaborative, consensus-seeking manner. Environment Canterbury and Hurunui District Council will receive the recommendations and make the appointments.

### **Quorum**

The quorum at a meeting consists of:

- (i) Half of the members if the number of members (including vacancies) is even; or
- (ii) A majority of members if the number of members (including vacancies) is odd.

### **Chair and Deputy Chair**

Each year, the Committee shall appoint the Chair and Deputy Chair from the membership by simple majority. There is no limit on how long a person can be in either of these positions.

### **Term of Appointment**

Members of Committees are appointed for a term of three years. To coincide with Local Government Election processes terms shall commence from January each year, with each Committee requiring confirmation of membership by the incoming Council. The term for community members will be staggered so that one third of the community members is appointed (or reappointed) each year. There is no limit on the number of consecutive terms.

## Financial Delegations

None

## Operating Philosophy

The Committees will at all times operate in accordance with the requirements of the Local Government Official Information and Meetings Act 1987, and will observe the following principles:

- 1) Give effect to the Fundamental Principles, Targets and goals of the CWMS;
- 2) Be culturally sensitive observing tikanga Maori;
- 3) Apply a Ki uta ki tai (from the mountains to the sea) approach;
- 4) Work with the CWMS Regional Committee to support the implementation of the CWMS across the region as a whole;
- 5) Give consideration to and balance the interests of all water interests in the region in debate and decision-making;
- 6) Work in a collaborative and co-operative manner using best endeavours to reach solutions that take account of the interests of all sectors of the community;
- 7) Contribute their knowledge and perspective but not promote the views or positions of any particular interest or stakeholder group;
- 8) Promote a philosophy of integrated water management to achieve the multiple objectives of the range of interests in water;
- 9) Seek consensus in decision-making where at all possible. In the event that neither unanimous agreement is able to be reached nor a significant majority view formed, in the first instance seek assistance from an external facilitator to further Committee discussions and deliberations. Where the Committee encounters fundamental disagreements, despite having sought assistance and exhausted all avenues to resolve matters, recommend that the respective Councils disband them and appoint a new Committee.

## Meeting and Remuneration Guidelines

- 1) The Committee will meet at least eight times per annum and with workshops and additional meetings as required. At times, the workload will be substantially higher. Proxies or alternates are not permitted.
- 2) Any Committee may co-opt such other expert or advisory members as it deems necessary to ensure it is able to achieve its purpose. Any such co-option will be on a non-voting basis.
- 3) Remuneration for members will be paid in the form of an honorarium currently set at the following levels:
  - a. Appointed members - \$4,000 pa
  - b. Deputy Chair - \$5,000 pa
  - c. Chair - \$6,000 pa.

Staff or elected members of Territorial Authorities or the Environment Canterbury shall not be eligible for remuneration.

Mileage will be reimbursed.

## Committee Support

The Committee shall be supported staff from the Territorial Councils and Environment Canterbury, primarily through the Committee Secretary and the Zone Facilitator.

### Map showing Hurunui Waiau Water Management

