

# **AGENDA**

## **Orari-Temuka-Opihi-Pareora Water Zone Committee Meeting Monday, 2 November 2020**

**Date** Monday, 2 November 2020

**Time** 9.30am

**Location** Council Chamber, Council Building, King George  
Place, Timaru

**File Reference** 1384586

## **Orari-Temuka-Opihi-Pareora Water Zone Committee**

**Notice is hereby given that a meeting of the Orari-Temuka-Opihi-Pareora Water Zone Committee will be held in the Council Chamber, Council Building, King George Place, Timaru, on Monday 2 November 2020, at 9.30am.**

### **Orari-Temuka-Opihi-Pareora Water Zone Committee Members**

Lucy Millar (Chairperson), Phil Driver (Deputy Chairperson), Suzanne Eddington, John Henry, Cr Anne Munro, Cr Elizabeth McKenzie, Luke Reihana, Glen Smith, Cr Barbara Gilchrist and Cr Tom O'Connor

Quorum – no less than 7 members

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- 1 Opening Karakia**
- 2 Apologies**
- 3 Public Forum**
- 4 Identification of Items of Urgent Business**
- 5 Identification of Matters of a Minor Nature**
- 6 Declaration of Conflicts of Interest**
- 7 Chairperson's Report**

## **8 Confirmation of Minutes**

### **8.1 Minutes of the Orari-Temuka-Opihi-Pareora Water Zone Committee Meeting held on 5 October 2020**

**Author:** Joanne Brownie, Governance Support Officer

#### **Recommendation**

That the Minutes of the Orari-Temuka-Opihi-Pareora Water Zone Committee Meeting held on 5 October 2020 be confirmed as a true and correct record of that meeting and that the Chairperson's electronic signature be attached.

#### **Attachments**

- 1. Minutes of the Orari-Temuka-Opihi-Pareora Water Zone Committee Meeting held on 5 October 2020**

# **MINUTES**

## **Orari-Temuka-Opihi-Pareora Water Zone Committee Meeting Monday, 5 October 2020**

**Minutes of Informal Orari-Temuka-Opihi-Pareora Water Zone Committee Meeting  
Held in the Council Chamber, Council Building, King George Place, Timaru  
on Monday, 5 October 2020 at 9.30am**

**Present:** Lucy Millar (Chairperson), Phil Driver (Deputy Chairperson), Cr Elizabeth McKenzie, Cr Barbara Gilchrist, Cr Tom O'Connor

**In Attendance:** Bailey Lissington (via electronic link)

Lesley Woudberg (Team Leader Zone Facilitator), Michael Nolan (ECan Zone Delivery Team), Janine Roux (ECan Zone Delivery Team), John Benn (Department of Conservation), Joanne Brownie (Governance Support)

### **1 Opening Karakia**

Cr Gilchrist opened the meeting with a karakia.

### **2 Apologies**

Apologies were received from Cr Anne Munro, Suzanne Eddington, Luke Reihana and Glen Smith. As there was no quorum for the official meeting, an informal meeting was held.

### **3 Public Forum**

There was no public forum.

### **4 Identification of Items of Urgent Business**

There were no urgent business items.

### **5 Identification of Matters of a Minor Nature**

There were no minor nature items.

### **6 Declaration of Conflicts of Interest**

There were no conflicts of interest to declare.

### **7 Reports**

#### **7.1 Update Committee Members' Activities**

The Committee considered an update from the Chairperson.

#### **Combined Catchment Groups Organisation**

In regard to the request to the Timaru, Waimate and Mackenzie District Councils and to Environment Canterbury for funding for resource for an overarching catchment group, an official reply has been received from the Mackenzie District Council with a letter of offer, Timaru District Council's Mayor is taking the request to his Council and Waimate District Council has informally discussed the request with a formal decision expected after its Council meeting on 13 October. The



Committee noted the time constraints, and emphasised the need for early decisions from the councils which have not yet responded.

In the meantime the group is doing some groundwork, including developing a constitution.

### **Pest Control**

Cr O'Connor and Cr McKenzie reported on a recent combined Waimate District Council and Environment Canterbury meeting. While there was consensus at the meeting that some action needs to be taken in regard to pest control, Cr O'Connor and Cr McKenzie believe more action is needed than is currently taking place ie pest control outside the containment zone and before next winters planting.

### **Climate Change**

Cr O'Connor suggested that the Zone Committee should not have a role in regard to combatting the impacts of climate change. The meeting was advised that ECan is assisting with the climate change/coastal inundation modelling part of the Canterbury Coastal Plan Review.

## **7.2 Testing Bore Water**

The Committee considered a report by Cr McKenzie on making it easy for property owners to test bore water. Options discussed included –

- Having an open community session where people can bring in samples for testing on the day/hold annual borewater workshops
- Investigate a quick triage method to test for ecoli and nitrates
- Do some public communication around the need to test regularly and advice as to how to collect samples correctly (eg video on facebook)

The Facilitator will prepare a proposal to bring back to the Committee.

## **7.3 Zone Delivery**

Michael Nolan gave a presentation on zone delivery – the structure, activities happening, and achievements (long tail bat protection, regionally significant consents, farming at GMP, focus on wetlands, streams and lagoons, rock art sites, biodiversity.)

In regard to which OTOP members are on which catchment groups, it was agreed to await the establishment of the collective catchment group incorporated society, then review representation of OTOP members on the catchment groups.

### **Waitarakao**

Michael explained the focus on the Waitarakao/Washdyke Lagoon and tabled an information flier on the checking of stormwater discharge activities. Nearly all the 40 consented industrial sites have been visited and good progress has been made on visits to the 190 non consented sites. Responses have generally been positive with people buying into the project.

John Benn (DOC) provided further background to the working group, its purpose and the work it has done since being established 3-4 years ago.

There was a suggestion made that there could be some sort of reward for compliance such as a notice at the site gate or a certificate. However the meeting was advised that this is not within the current scope of the project. Alternatively it was suggested that those industries performing well be promoted via the website/media. The Committee was conscious of not intruding on the work

of the Waitarakao group, therefore it was suggested that any media release be scripted from the angle of the OTOP Zone Committee supporting the working group's activities and acknowledging the results of the compliance work through promoting good performers.

It was agreed that the issue be referred to the Facilitator and Michael Nolan of the Zone Delivery Team to prepare a compliance good story and options for good management practice.

#### **7.4 Facilitator's Update**

The Committee considered the Facilitator's update.

##### **Pest Control**

Concern was again expressed at pest control and the need for more effective action, noting farmers cannot always afford to fund the control necessary and while one landowner may take sufficient action, a neighbouring property may not. Cr McKenzie agreed to follow up as to what is possible and the most effective place for pest control to fit.

##### **Tree Planting**

Tree planting and lizard habitat development has been planned for 11 October at the Eco Centre at Redruth for youth participation.

There is also a planting day planned for the Waihao/Wainono Catchment Group on 10 October.

##### **Climate Change**

A climate change workshop is being planned with a tentative date of 22 October at 5pm.

Cr O'Connor advised he has previously written a paper on climate change and offered it to the committee to read. The paper will be emailed to members.

#### **8 Consideration of Urgent Business Items**

There were no urgent business items.

#### **9 Consideration of Minor Nature Matters**

There were no minor nature items.

#### **10 Closure Karakia**

**The Meeting closed at 10.40am with a karakia from Cr Gilchrist.**

.....  
**Chairperson**

## 9 Reports

### 9.1 Deep South Science Challenge

**Author:** Jo Doyle, Governance Advisor

**Authoriser:**

#### Recommendation

That this report from Lesley Woudberg be received.

#### Purpose of Report

- 1 To provide the OTOP Zone committee with information on some of the research being undertaken to support New Zealand's response to a changing climate.

#### Assessment of Significance

- 2 The mission of the Deep South Challenge: Changing with our Climate is to enable New Zealanders to adapt, manage risk and thrive in a changing climate.
- 3 We know that scientists, industry and communities must work together if society is to adapt to our changing climate. Climate science can be complex and challenging, and isn't always effectively incorporated in planning and decision making. Our challenge is unique among climate research programmes in New Zealand for the way it joins together physical science, predictive climate modelling and social science. To guide planning and policy, we're bringing together new research approaches to determine the impacts of a changing climate on our climate-sensitive economic sectors, infrastructure and natural resources.
- 4 We're engaging closely with central and regional government, whānau, hapū and iwi, business, infrastructure and industry. We're collaborating with decision makers to share our research about the kinds of climate change impacts we can expect in the coming decades and centuries, and to develop the kinds of tools required to help people make decisions in the face of complex changes in the future.
- 5 Through innovative community engagement and multi-disciplinary research collaborations, our five interlinked programmes connect scientists with society.
- 6 Dr Anita Wreford, Lincoln University leads the Impacts and Implications programme. The Programme aims to make sure that New Zealanders can properly consider and evaluate key impacts of climate change. The research into the impacts of climate change will also feed into and be informed by the emerging [New Zealand Earth System Model](#). There also needs to be a better understand the institutions that facilitate climate change adaptation. <https://www.deepsouthchallenge.co.nz/programmes/impacts-and-implications>

#### Attachments

Nil

**9.2 Chairpersons Report and Update Committee Members' Activities**

**Author:** Jo Doyle, Governance Advisor

**Authoriser:**

**Recommendation**

That this report from Lucy Millar be received.

**Purpose of Report**

- 1 Provide the OTOP zone committee with an opportunity to inform each other of the activities they have been involved in over the last month that contributes to the implementation of the CWMS in the OTOP zone.

**Attachments**

1. Letter of Shared Priorities - Waimate District Council and Environment Canterbury



13 October 2020

Canterbury Water Management Strategy (CWMS) Environment Canterbury  
Orari-Temuka-Opihi-Pareora Chair Lucy Millar  
*lucy@opuha.co.nz*  
Lower Waitaki Zone Committee Chair Bruce Murphy  
*bruce@murphyfarms.co.nz*

Dear Lucy and Bruce

**WAIMATE DISTRICT COUNCIL AND ENVIRONMENT CANTERBURY PRIORITIES FOR THE PERIOD JULY 2020 – DECEMBER 2022**

We would like to take this opportunity as Mayor of Waimate District Council and Chair of Environment Canterbury to convey our Councils' priorities as they relate to water management in Canterbury, and identify the areas where our council would like the assistance of the Orari-Temuka-Opihi-Pareora (OTOP) and Lower Waitaki Zone Committee over the period July 2020 – December 2022.

Firstly, we wish to thank your Zone Committee for its contribution to the CWMS over the last ten years. We'd particularly like to thank you for your efforts to engage communities to develop your Zone Implementation Programme (ZIP) in the early years and for the achievements to date of the OTOP and Lower Waitaki Zone Committee.

Since 2009 when councils throughout Canterbury and Ngāi Tahu decided there needed to be a better way to manage our freshwater than the previous 20 years of litigation much has changed. We now have a clear planning framework, investment in action is being taken across all sectors and the Government has set clear direction in a National Policy Statement and standards for freshwater. We are still recovering from two significant earthquakes, mycoplasma-bovis and now Covid-19 that has and will continue to have a huge impact on communities in the region.

A fundamental principle of the CWMS is that we need to work together in order to achieve our shared outcomes and targets.

Our councils are committed to work alongside Papatipu Rūnanga and communities for better freshwater and biodiversity outcomes in the zone. We felt it timely to clearly set out the priorities of our councils, and to seek your assistance to support the implementation of the CWMS.

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**WAIMATE DISTRICT COUNCIL**  
125 Queen Street, Waimate 7924  
PO Box 122, Waimate 7960, New Zealand

**P.** +64 3 689 0000  
**E.** [council@waimatedc.govt.nz](mailto:council@waimatedc.govt.nz)  
**W.** [waimatedc.govt.nz](http://waimatedc.govt.nz)

We recognise the Government also wishes to see greater progress in the way we manage freshwater. We expect the Government will finalise its "Action for Healthy Waterways" in the near future and when they do we will review and amend our current priorities if required.

#### **WAIMATE DISTRICT COUNCIL PRIORITIES**

The Waimate District Council is committed to continuing to support the OTOP and Lower Waitaki Zone Committees.

Looking ahead, we would like the **OTOP Zone Committee** to focus on the following actions/priorities within our District:

- Safe drinking water free of contaminants for humans and animals
- Rivers and wetlands have healthy ecological flows and high quality water
- Rural and urban communities are fully engaged and have ownership of water management processes
- Native and indigenous wildlife associated with waterways have adequate habitats

Looking ahead, we would like the **Lower Waitaki Zone Committee** to focus on the following actions/priorities within our District:

- Increased community engagement on water quality issues and improvement opportunities across the wider community (including schools)
- Improving water quality and enhance immediate environs of Lake Wainono and the Waihao River and catchment area
- Achieving a higher uptake of water quality responsibility from land owners to ensure water quality improves as it travels along the waterway system.

#### **ENVIRONMENT CANTERBURY PRIORITIES**

Environment Canterbury is committed to playing its part to implement the CWMS. In our term of Council, we wish to see greater progress being made to achieve freshwater outcomes that promote resilient and sustainable community priorities.

We have therefore set the following priorities where we believe zone committees can make the greatest difference over the balance of the term. These priorities are in line with the

Environment Canterbury Strategic Direction and the functions of a regional council:

- **Kaitiakitanga Wāhi Toanga and mahinga kai Targets**

In particular, working alongside landowners, Rūnanga, communities, Councils and others to inspire and grow support and resources to achieve the 2025 mahinga kai goal of five mahinga kai projects in each zone.

- **Ecosystem Health and Biodiversity Targets**

In particular, working alongside landowners, Rūnanga, communities, Councils and others to inspire and grow support and resources to achieve the 2025 target goal covering all freshwater ecosystems through;

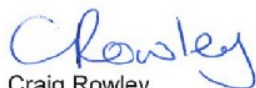
- i. increased riparian management to protect aquatic ecosystems;
- ii. reducing the number of fish barriers in the zone
- iii. protection and enhancement of named wetlands

- **Recreation and Amenity Targets**

In particular, the Water based recreational opportunity through working alongside landowners, Rūnanga, communities, Councils and others to support and grow resources to achieve the 2025 target to restore priority freshwater recreation opportunities in each zone, that do not meet contact recreation standards and developing plans and actions to achieve and show measurable progress.

Waimate District Council and Environment Canterbury look forward to receiving your Action Plan for specific to your zone for the period July 2020 – December 2022 and to continue to work alongside you and your communities to deliver the CWMS.

Yours sincerely



Craig Rowley  
Mayor  
Waimate District Council

Jenny Hughey  
Chair  
Environment Canterbury





### 9.3 Immediate Steps Projects

**Author:** Jo Doyle, Governance Advisor

**Authoriser:**

#### **Recommendation**

That the OTOZ Zone Committee will recommend to Environment Canterbury the following Immediate Steps funding allocation:

1. Ohapi Creek and Spider Lagoon Restoration – Stage 1 – 18,000
2. Taniwha Gully Restoration - \$14,000 (\$7,000/year)
3. Serpentine Creek, Geraldine - \$2,500

#### **Purpose of Report**

- 1 Janine Roux and Jessica Bond, Land Management and Biodiversity Advisors Environment Canterbury have written this report to provide recommendations on the allocation of Immediate Steps funding for the 2020/2021 financial year. \$47,867 is left to be allocated for this financial year. This report outlines projects to the sum of \$27,500.

#### **Assessment of Significance**

- 2 The Immediate Steps biodiversity (IMS) funding programme was launched in 2010 as part of implementing the Canterbury Water Management Strategy (CWMS). Alongside planning and other measures, this funding is used to contribute to halting or reversing the decline in indigenous biodiversity associated with the increasing use of water resources in Canterbury.
- 3 Each of the ten Water Zones in Canterbury has \$100,000 of Immediate Steps funding per year to allocate on projects to protect and restore biodiversity. The CWMS Water Zone Committee in each zone provides guidance and recommendations supporting the allocation of the IMS funds. The Immediate Steps funds are administered, allocated, and monitored by Environment Canterbury.

**Discussion**

## 4 Funding Summary

2020-2021 Financial year			
<b>Project</b>	<b>Amount</b>	<b>Type of work funded</b>	<b>Outcome</b>
Ohapi Creek and Spider Lagoon Restoration	\$18,000	Weed control	To be confirmed
Taniwha Gully	\$7,000	Plants, guards and mats	To be confirmed
Talbot Forest Working Group	\$2,500	Weed control	To be confirmed
Grange Hill Fencing Stage 1	\$13,800	Fencing	Granted
Orari River Protection Group	\$15,000	Weed control, pest control	Granted
Waitarakao Lagoon	\$10,000	Planting	Granted (in principal)
Upper Rangitata Predator Control	\$13,333	Pest control	Granted
<b>Total</b>	<b>\$52,133.00</b>		
IMS funding still available	\$20,367.00		

**Attachments**

## 1. Immediate Steps Projects

## 1. Proposed 2020/21 projects for approval

### Project: Ohapi Creek and Spider Lagoon Restoration - Stage 1

**Location:** Milford

**Description:** The Ohapi Creek is a meandering creek starting south of Orari township and runs alongside the Orari River. Near the head of the Ohapi, the creek diverges with most of the flow running straight into the Orari. The remaining 10% of flow is left to meander along the original creek's path coming out further downstream in the Orari River.

The area of work is adjacent to a DOC parcel that includes Spider Lagoon and spring fed fingers that run through both private land and DOC. Both the lower reaches of the creek and one of the lagoon's fingers has willows that, with removal can improve the chances for the native undergrowth to flourish, restoring the area into native vegetation. This will also improve habitat for native species as well as the hydrology. Both the lagoon and creek contain native species including: Shortfin eel, Inanga, Freshwater shrimp, and Common Bullies.

**Outcomes:** Ecological restoration of part of Ohapi creek and Spider Lagoon to improve water quality and fish habitat. Removing willow and invasive canary grass allowing native vegetation to regenerate and to restore it for future generations to benefit.

#### Funding breakdown:

<i>Approximate cost</i>	<i>Item</i>
\$18,000	Ground weed control targeting Willow and Canary Grass
\$6,000	Helicopter Willow Control
<b>\$24,000</b>	<b>Total</b>

#### IMS funding to contribute to the project: \$18,000

**ZIP:** The project aligns strongly with the outcomes set in the Zone Implementation Plan including:

**2.3.1:** "Immediate Steps Funding – Invest in projects that ... have sufficient scale to make a long-term impact; protect and enhance ecosystem integrity and function. Priorities are...lowland streams and lagoons where initiatives contribute to water quality; activities that enhance biodiversity habitat, mahinga kai and sports fisheries."

**ZIPA:** The project aligns with the recommendations set in the Zone Implementation Plan Addendum including:

#### 4.5.5 Recommendation: Protection for Named Water bodies

- i. The policies and rules of the OTOP sub region section of the LWRP provide for protection of the following wetlands and hāpua, particularly in respect of water and land use activities that may affect their natural character and function:

a. Spider Lagoon



Image 1: Area with harakeke (flax) understory under willows



Image 2: Area of carex and harakeke with willows up stream



Image 3: Map of recommended weed control.

## Project: Taniwha Gully Restoration

**Location:** Gould Road, Pleasant Point

**Description:** Taniwha Gully is part of a 10ha property leased by Ngai Tahu Māori Rock Art Trust. The area has important cultural and natural values and includes a group of 13 nationally significant Māori rock art sites; the most well-known tuhituhi o neherā (rock art) is the Taniwha found on the ceiling of a north-facing cave. The property is protected with a QEII covenant and contains three Significant Natural Areas which are listed with the Timaru District Council.

The Gould Property has extensive calcareous cliffs and scarps, some of which are within Taniwha Gully. Like many areas of limestone, the ecology of the area has been degraded by farming practices and the impacts of pest plant.

Ecological restoration has been undertaken by the Ngai Tahu Māori Rock Art Trust since 2016. This project is focusing on the control of woody weeds and has a progressive planting programme to achieve re-establishment of indigenous vegetation. Previous IMS funding was granted in 2018.

**Outcomes:** Ecological restoration and improved functioning of valley floor wetland of Taniwha Gully; Protection of local Māori rock art; Development of an educational site with the aim of: raising awareness of both mahika kai and tuhituhi o neherā as cultural practices and to perpetuate these practices in current and future generations.

### Funding breakdown:

<i>Approximate cost</i>	<i>Item</i>
\$4,632.00	Pre-planting prep for May and September
\$6,900.00	Plants for May and September
\$3,540.00	Plant guards and matting for May and September
\$4,980.00	Planting labour for May and Sept
\$7,080.00	Plant guards and matting for Sept planting
\$10,169.00	Weed maintenance post planting July, Oct, Dec
<b>\$33,761.00</b>	<b>Total</b>

**IMS funding to contribute to the project: \$14 000 (\$7000/year)**

**ZIP:** The project aligns strongly with the outcomes set in the Zone Implementation Plan including:

**2.3.1:** "Immediate Steps Funding – Invest in projects that ... have sufficient scale to make a long-term impact; protect and enhance ecosystem integrity and function. Priorities are...lowland streams and lagoons where initiatives contribute to water quality; activities that enhance biodiversity habitat, mahinga kai and sports fisheries."

**ZIPA:** The project aligns with the recommendations set in the Zone Implementation Plan Addendum including:

- 2. **4.5.9.x.d:** “opportunities to protect high value species, sites or habitats in the zone, especially in the upper catchments.”



Image 1 and 2. Taniwha Gully planting progress (left 2016; right 2020)



Image 3 and 4.  
Taniwha Gully  
planting  
progress (top



left 2016; right 2020)

## Project: Serpentine Creek Himalayan Balsam Eradication

**Location:** Serpentine Creek, Geraldine

**Description:** Starting from its source south of Pye Road, Serpentine Creek runs 4.4km down into the Waihi River passing through Geraldine. The creek traverses through public and private land, notably Talbot Forest, and Geraldine Domain. With habitats varying from aquatic habitat passing through: exotic forest, native bush, public amenity areas, grazed farmland, and private property.

In recent years, the presence of Himalayan Balsam has been found throughout the creek. This pest plant is a highly invasive garden escapee, threatening biodiversity values along the course of the creek. It is very seeding in nature, has an attractive appearance, and the ability to be transported by water.

The Talbot Forest Working Group has undertaken work over the past two years to physically remove the weed as well as raise awareness of the spread of the weed and control efforts. However, there is still work required for both weed control and promotional awareness to achieve full eradication of the species from the catchment before it establishes past current level and into the Waihi catchment.

**Outcomes:** Educate community members of the risks associated with invasive weeds; eradicate Himalayan Balsam from the Serpentine Creek catchment before it spreads through the rest of the catchment.

### Funding breakdown:

<i>Approximate cost</i>	<i>Item</i>
\$2500	Contractor and spraying materials
\$854	Promotional flyers, printing and letterbox drop-off (volunteers)
\$400	Follow-up control and on-going surveillance (volunteers)
<b>\$3754</b>	<b>Total</b>

**IMS funding to contribute to the project: \$2500**

**ZIP:** The project aligns with the outcomes set in the Zone Implementation Plan including:

**2.3.1:** "Immediate Steps Funding – Invest in in projects that ... have sufficient scale to make a long term impact; and protect and enhance ecosystem integrity and function. Priorities are... activities (weed control...) that enhance biodiversity habitat, mahinga kai and sports fisheries."





Image 1 and 2: Himalayan Balsam along serpentine creek at the beginning of 2020

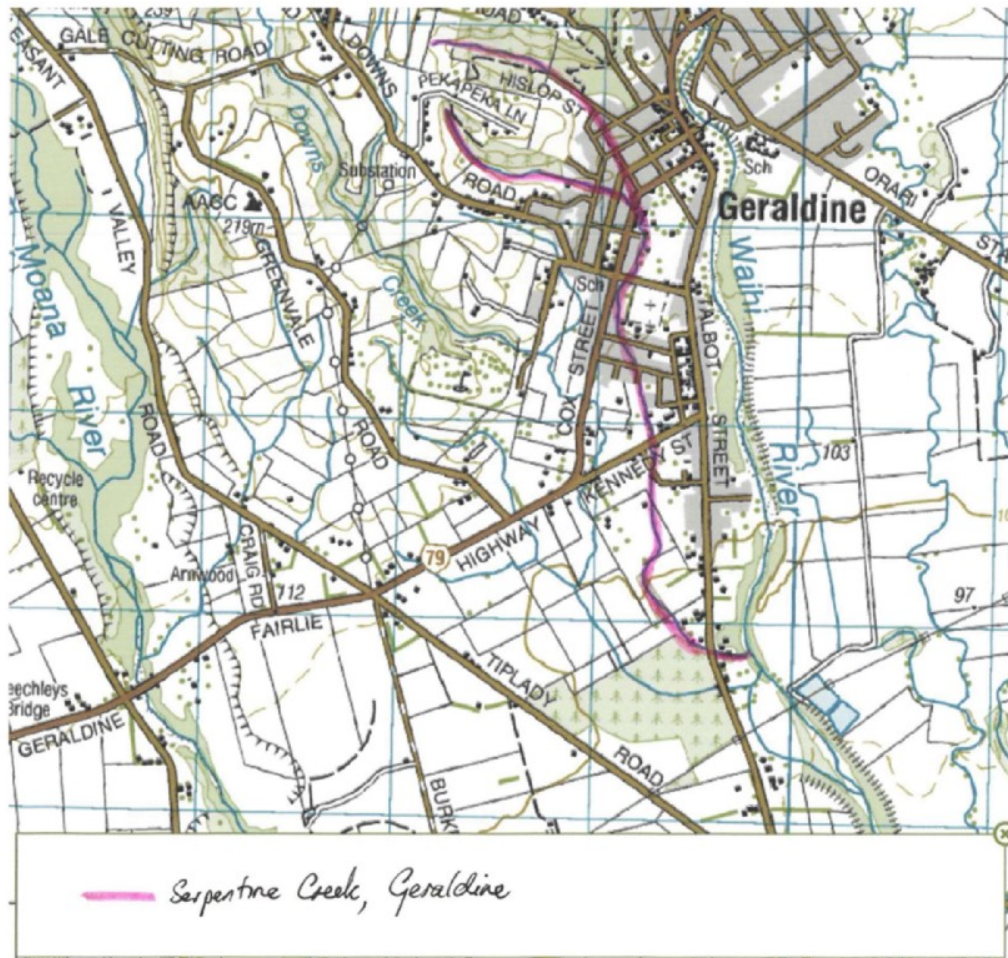


Image 3: Map of Serpentine Creek

#### 9.4 Climate Change and Slow Water

**Author:** Jo Doyle, Governance Advisor

**Authoriser:**

##### **Recommendation**

That the OTOP Zone committee receive this report from Dr Phil Driver and Cr Tom O'Conner and:

1. Make recommendations and endorsements (yes/no?)
2. Learn more so we can make better recommendations and endorsements (yes/no?)
3. Agree that our climate emergency is the single biggest physical issue that will impact on water management in Canterbury (yes/no?)
4. Recommend that stakeholders in the OTOP zone adopt a theme of 'slow water' as being the best way of addressing our biggest challenge (yes/no?)
5. Explore, develop and disseminate recommendations on how best to achieve 'slow water' (these could be both regulatory and non-regulatory) (yes/no?)

##### **Purpose of Report**

- 1 Provide the OTOP zone committee with an opportunity to decide what it wishes to do with the proposal put forward to focus its efforts on climate change and the concept of "*Slow Water*".

##### **Attachments**

1. **Additional Paper from Tom O'Conner**

## **Additional - Paper from Cr Tom O'Conner**

January 2019

**A discussion paper on the potential for increased incidents and severity of drought in eastern New Zealand and options for local body responses to that possibility to assist agriculture and protect potable water supplies.**

This paper does not address the issue of mitigating or reducing human induced accelerated climate change. That is the role of central government.

Local government bodies however have a role in reacting to and preparing their communities for the predictable and actual impacts of climate change. A Local Government New Zealand symposium on climate change in September last year covered climate change induced sea level rise and increased incidents of severe flooding.

The outcome of those discussions will be included in the LGNZ Climate Change Project Report, which will provide regional and district councils with information for risk reduction and/or retreat. There will also eventually be a local government view on emission reduction targets and how best to achieve them.

The symposium did not cover other climate change induced phenomenon such as extended severe drought in traditionally low rainfall regions like Canterbury and Otago and the North Island East Coast.

I do not have the scientific knowledge to advise on that issue and have relied on the work of Dr Brett Mullan, Principal Scientist of the NIWA Climate Group. He advises that there have been consistent climate change projections for more than a decade, predicting drier conditions in eastern New Zealand and an increase in drought occurrence and severity.

I have included below parts of the summary of a report Dr Mullan co-wrote on the subject to show what we might be faced with in the long term and what we probably should be prepared for in the immediate short term.

### **Key Findings**

1. Drought risk is expected to increase during this century in all areas that are currently already drought-prone, under both the 'low-medium' and the 'medium-high' scenarios.
2. Under the 'low-medium' scenario, by the 2080s severe droughts (defined in this report as the current one-in-twenty year drought) are projected to occur at least twice as often as currently in the following areas: inland and northern parts of Otago; eastern parts of Canterbury and Marlborough; parts of the Wairarapa; parts of Hawkes Bay; parts of the Bay of Plenty; and parts of Northland (see Figure ES1).
3. Under the 'medium-high' scenario, our results suggest that the frequency of severe drought in these areas could increase even more. By the 2080s, severe droughts are projected to occur more than four times as often in the following regions: eastern parts of North Otago, Canterbury and Marlborough; much of the Wairarapa, Bay of Plenty and

Coromandel; most of Gisborne; much of Northland. For many of the other eastern regions, the frequency of severe drought is projected to at least double by the 2080s under this scenario.

4. Water deficits in an average year are projected to increase by between about 50 mm and 250 mm PED in the driest regions by the 2080s, depending on the climate scenario and location. Annual averages are currently about 300-500 mm PED in these areas. In some dry areas, a 200 mm increase in average annual PED would mean that a drought of medium severity (such as the 1991/92 drought in Canterbury) could become the yearly norm in those areas by the 2080s.

5. The projected increased PED accumulation over the year would probably produce an expansion of droughts into the spring and autumn months. For the 'medium-high' scenario, the drying of pasture in spring is advanced by about a month in the 2080s in dry eastern regions, relative to the present climate.

#### **Points to bear in mind when reading this report**

Projections of future climate and resulting drought risk, particularly at the regional level, are subject to considerable uncertainty. This report should be taken as a guide to what may happen, rather than a categorical set of predictions. In particular: The New Zealand climate change scenarios used in this report span the central portion but not the full range of IPCC projections of possible global temperature changes (1.4 to 5.8°C by 2100). Thus changes in drought risk which are smaller than those projected under our "low-medium" scenario are possible, particularly if substantial international action is taken to reduce greenhouse gas emissions. Similarly, changes greater than our "medium-high" scenario are also possible.

The study utilises projected future daily time-series of rainfall to produce the future PED scenarios. These are obtained by adjusting observed daily rainfalls by monthly factors obtained from the downscaled global climate model predictions. This approach assumes there is no change in the number of wet days each month compared to the present climate - just a proportional change in the amount of rain each wet day.

Results presented in this report assume that the increase in leaf stomatal resistance to evapotranspiration due to rising carbon dioxide levels is roughly offset by an increase in leaf area. 'Increase in stomatal resistance' refers to the idea that less moisture passes through the minute pores (stomata) in a plant's leaves and stem when there is more CO<sub>2</sub> in the atmosphere. But increased CO<sub>2</sub> concentration will also stimulate leaf growth because CO<sub>2</sub> acts as a fertiliser, so the number of stomata through which moisture can pass increases. We assumed in this report that the two effects cancel each other out. The technical appendix to this report discusses the possible implications of changes in stomatal resistance on the projected changes in drought risk.

The projected changes are relative to a 1972-2003 baseline, a period probably already somewhat drier in the east than for the 20th century overall because of long-term (20-30 year) natural variation in the climate. This long-period natural variation will continue to influence drought risk from decade to decade, in addition to the changes expected from increased greenhouse gases.

Our PED calculations, and comments on drought frequency, are for unirrigated pasture. Irrigation can in principle offset increases in drought risk where sufficient water for irrigation is available. This report does not address how actual irrigation demand for river or ground water may change in future, or how current water resources might be affected by lower annual rainfall and increased drought frequency. This is a subject on which further research is recommended.

A 'one-in-twenty-year' or 'twenty-year average recurrence interval' event will not normally occur precisely once every twenty years. Over a very long period of time such an event is expected to occur in one twentieth of all years, but any separate individual events may occur closer or further apart in time.

This report focuses on drought risk and does not explore possible implications of climate change for heavy rainfall and flooding. The report indicates that many parts of New Zealand are likely to become drier on average, but this is in terms of the moisture availability for pasture growth."

A more recent NIWA paper notes;

Potential evapotranspiration deficit (PED) is the cumulative sum of the difference between potential evapotranspiration (PET) and precipitation from 1 July of a calendar year to 30 June of the next year, for days of soil moisture under half of available water capacity (AWC), where an AWC of 150 millimetres for silty-loamy soils is consistent with estimates in previous studies (eg, Mullan et al, 2005). PED, in units of millimetres, can be thought of as the amount of rainfall needed to keep pastures growing at optimum levels.

The PED changes are largely based on, and consistent with, the bias corrected temperature and precipitation change patterns in the regional climate model. Changes in other uncorrected climate variables (radiation, relative humidity and wind) also influence calculated PED changes, but to a lesser degree. The increase in the magnitude of the climatological mean PED anomaly is in general a stochastic function of time and radiative forcing. The spatial variability of PED is mostly well captured over most of New Zealand. The change in PED is considerable, especially in the drought-prone northern and eastern coasts of the North and the South Island for all RCPs other than RCP2.6. Further research validating PED for the 'past' period, and removing biases from uncorrected climate variables, will enhance confidence in future projections and change signals.

The paper also notes that a predictable reduction in snow days will result in less snowmelt water to recharge rivers and aquifers.

**It does not necessarily mean the frequency of very heavy rainfall and floods will decrease. Previous research suggests the frequency of very heavy rainfall may in fact increase in many parts of New Zealand, even in those areas where the annual rainfall decreases on average.**

We can take it from Dr Mullan's report and the NIWA paper that drought as well as heavy rain events and fewer snow days in eastern New Zealand will likely become more frequent and both will be more severe and that we also have some time to consider our response, if any, to those possibilities.

**What will increasingly severe droughts do to eastern New Zealand rural industries?**

Logically we can expect most forms of agriculture to be increasingly challenged by the lack of rainfall at crucial times and by heavy rain events at others. Some of the effects of accelerated climate change are already being felt and can be expected to increase with time. Pasture and crop farming could face a double jeopardy with heavy rain inhibiting seed strike in spring and harvest in autumn and dry periods preventing growth both at crucial times.

Drought and other adverse weather events conditions in the past four years have resulted in growing number of dairy farmers opting out of the industry. Dairy expansion, whether it's from land conversions or farmers buying existing farms appears to have slowed from the heady days of 2014 dairy land price boom. Sales of farms have stalled in the last year (2018) with record numbers of properties coming on to the market, the Real Estate Institute (REINZ) reports. Institute spokesman Brian Peacocke said there were a number of reasons why dairy farmers in Waikato and Southland in particular were putting their properties on the market. He said the drivers for such a movement appear to be a mix of the following: succession planning/increasing age of farmers, frustration for some resulting from the climatic conditions and difficulties with labour, the inexorable increase in compliance issues and the awareness it is probably better to sell when the dairy payout is at a reasonably healthy level as opposed to when the payout is under pressure.

One solution to the drought issue would appear to be water farming, using dams and ponds to collect surplus surface water during heavy rain events and irrigation during dry periods. That may not be as straight forward as it seems given the cost of existing water storage schemes and the resistance to harvesting flood waters by conservation groups. Abstraction of water from aquifers will likely be even more difficult and restricted.

Dr M.S. Srinivasan of NIWA is heading a group to help farmers manage what has been called Justified Irrigation. Dr Srinivasan reports that;

“Expansion of irrigation merely through increasing water abstraction is coming to an end. The future is about making better use of available water. This is a result of abstraction limits, high capital and operating costs of new supplies and the effects and costs of inefficient water application, including degraded downstream water bodies and contaminated groundwater. Our approach is to support farmer decision making by providing carefully customised information on current demand and future supplies (e.g., forecast rainfall) via an online farm-scale system.

We aspire to help farmers apply irrigation ‘justifiably’. Justified Irrigation (JI) will address the question of maintaining farm productivity, as influenced by irrigation practices, based on advanced, high resolution weather forecasts. We envisage a future where farmers actively manage irrigation, applying precisely the water needed—when, where and how much. As a consequence, farmers will increase yields, reduce costs (fertilizer, energy) while environmental flow, water quality and nutrient leaching targets are met. Motivation for uptake of JI is through both the need to reduce direct costs and to comply with increasingly stringent planning rules.”

What we can take from that is that abstraction from aquifers and surface water systems for agricultural irrigation will come under increasing restriction as regional councils seek to reduce the impact of nutrient run off on natural water bodies, reduce the related nutrient emissions which arise from increased irrigation and correct historic over allocations in some waterways.

There is also the issue of the cost of irrigation both in the establishment phase, as we saw with Hunter Downs in South Canterbury, and in the ongoing operating costs as well as the individual on-farm infrastructure costs. The Hunter Downs scheme failed to attract sufficient farmer commitment because it became unaffordable and significant economic potential for South Canterbury was lost.

There is also the serious issue of protecting the quantity and quality of fresh water used for reticulated domestic use. Any increase in irrigation will bring a predictable increase in association nutrient emissions which will have the potential to impact on potable water sources. While the supply of potable water has priority over all other uses, are the current time frames for meaningful reductions in nutrient emissions too long if we have regular severe droughts in the next five to ten years? Can we therefore assume that we need to have as near to zero emissions as possible before the predicted droughts occur and will the current time frames achieve that?

As with the response to sea level rises and increased incidents of major flood events we should rely on planning solutions rather than engineering solutions, if indeed we need to be looking for solutions at all.

Planning for flood events and sea level rises is relatively logical but planning for drought events has few options.

Farmers in some non-drought prone regions have accepted a change in operations and a move away from reliance on pasture alone and a significant reduction in production and increased reliance on irrigation. It is obvious that farming will be different by 2050 but do we have that amount of time to prepare for increased incidents and severity of drought? Do we also need to investigate ways of keeping water in rivers and streams for longer before it flows into the sea? Many of our lowland streams and rivers have been manipulated and managed as little more than drains with increased velocity for more than a century as surrounding wetlands were converted to pasture.

Hans Versteegh of the Marlborough Unitary Authority has pointed out that one of the more interesting matters that needs resolving is the meaning of drought. Although the term drought is widely employed there is no statutory definition and most understandings are mostly emotive in nature.

If Central and/or Local Government is going to be involved in assisting to manage or mitigate drought do we need a statutory definition?

#### **Summary of what we know so far**

- Evidence suggests we will get more heavy rain events and fewer snow days in east coast regions in the near and long term future but total annual rainfall may not



increase significantly. The evidence also suggests there will be longer and more severe drought periods in between rain events.

- Current levels of farm production will become more reliant on irrigation than at present.
- Access to water for irrigation will become increasingly restricted as regional councils try to reverse the current trend of increasing freshwater degradation from resultant nutrient emissions, and historic over allocation of some waterways.
- The cost of establishing irrigation schemes, on-farm infrastructure and ongoing operations has become prohibitive for many farmers other than for large scale capital-intensive dairy operations. The development of these properties has stalled with many dairy farmers unable to sell their farms on a glutted market.
- The need to protect the quantity and quality of water for potable supplies will take on increasing importance
- There is no statutory definition of drought.

### **Conclusion**

If we assume that local government has a role to play in helping their rural communities adapt to drought induced by accelerated climate change we need strategies to assist communities in drought prone regions while at the same time avoiding the negative impacts of irrigation in the form of nutrient emissions and correcting over allocation of some waterways.

### **Discussion points**

1. We could decide to do nothing and leave rural communities and farmers to make their own decisions on how to adapt to increased drought and survive as best they can.
2. LGNZ could take a case to Central Government to overcome the initial prohibitive establishment costs of irrigation if that phase was funded by a government interest free loan over 50 – 80 years with ongoing operating costs funded through a targeted rate against those properties involved in schemes. That would leave only on-farm infrastructure costs to be met by farmers. The quid pro quo would be zero allowance for nutrient emissions within five years from the beginning of operations. Such a system would make irrigation affordable by avoiding the debilitating cost of finance. It would also give regulation and management of irrigation and nutrient emissions to Central Government where, it could be argued, it belongs.
3. Should there be increased and more robust protection for the supply and quality of potable water than currently exists?
4. How do we define drought as a trigger for Central or Local Government intervention and should such a definition be a national standard or variable for each region?
5. I have been assisted with this discussion paper by Dr Brett Mullan, Principal Scientist of the NIWA Climate Group, the work of Dr M.S. Srinivasan of NIWA, Hans Versteegh of the Marlborough Unitary Authority, Waimate District councillors and senior staff and councillor Cynthia Brooks Marlborough Unitary Authority. I sincerely appreciate their advice and encouragement.

Tom O'Connor

Waimate District Council



## 9.5 Private Drinking Water Supplies - Surface Water, Groundwater and Rainwater

**Author:** Jo Doyle, Governance Advisor

**Authoriser:**

### Recommendation

That the OTOZ Zone Committee receive this report from Lesley Woudberg and Cr Elizabeth McKenzie and:

1. **Agree** to develop an awareness raising campaign for domestic drinking water supplies in order to ensure the OTOZ community has “safe and reliable drinking water for community and domestic supplies both now and in the future”.  
(ZIPA Community Outcome page 13)
2. **Agree** that phase 1 of the campaign will be to;
  - (a) Disseminate existing information to committee member’s networks and catchment groups;
  - (b) Discuss existing information with community members at four farmers markets to determine what they know, what they would like to know and what they see as the barriers to ensuring their drinking water is safe.
3. **Agree** that phase 2 of the campaign will address the information gaps and barriers that have been identified through the discussions at farmers markets. This may include a community meeting with representatives of registered testing laboratories, South Canterbury District Health Board and district and regional council as well as preliminary screening of samples for nitrate levels.
4. **Agree** that phase 3 will evaluate the campaign and decide on what next.

### Purpose of Report

- 1 Provide a draft campaign proposal for the Zone Committee to raise awareness among private landowners owners to regularly test and manage the risks associated their drinking water supplies.

### Assessment of Significance

- 2 During the meeting (5 October members) the Committee discussed the idea of hosting an event to raise awareness among private landowners of their responsibility to regularly test their drinking water and take action to reduce/manage the risks of contamination.
- 3 Selwyn Waihora zone committee are also working on a similar campaign to raise awareness of risks and responsibilities associated with domestic drinking water supplies - whether the source of that water is from rivers and creeks, groundwater or rainwater tanks.
- 4 Three Water staff from Canterbury’s district councils have been preparing information for private suppliers that we understand will be available by the end of the year.
- 5 In addition; there is a wealth of information available, if you know where to look on the Ministry of Health, District Health Board, District Councils and Regional Council websites.

**Outcome**

Safe and reliable drinking water for community and domestic supplies both now and in the future” (ZIPA Community Outcome page 13)

**What**

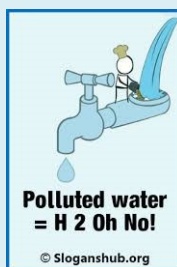
Raise awareness among private water suppliers of;

- the risks of contamination
- their need to proactively manage risks to their water supply
- their need to take action

**How**

**Preparation** Gather Information (Nov/Dec 2020)

- Gather and collate informative/engaging material
- Develop a ‘catchy’ slogan (eg. other ZC campaigns Love our Lakes and Stormwater Superhero) eg.



**Phase 1** Disseminate & Test (Mar/April)

- Share information with networks
  - Seek feed back on whether this information is useful, what else do people need
- Attend four farmers markets to;
  - Find out what people know, what they don't, what they see are the barriers to proactively managing risks to their water supplies

**Phase 2** Share information (May)

- Address information gaps
- Hold a community event
  - Host a community event – invite registered laboratories, District Health Board, District and Regional Council to share what they do and the services they offer
  - Provide an opportunity to have sample water screened to determine indicative nitrate levels

**Phase 3** Evaluate (June)

- What worked what didn't?

- Next steps/or not?

**Attachments**

Nil

## 9.6 Facilitators Update

**Author:** Jo Doyle, Governance Advisor

**Authoriser:**

### Recommendation

That this report from Lesley Woudberg be received.

## Report

### Central Government

#### Ministry for the Environment - Essential Freshwater Guidance

<https://niwa.co.nz/climate/seasonal-climate-outlook/seasonal-climate-outlook-october-december-2020>

#### Freshwater Improvement Fund

2<sup>nd</sup> Round open 27 January closes 10 February

<https://www.mfe.govt.nz/more/funding/freshwater-improvement-fund>

#### NIWA – Seasonal Climate Outlook October - December 2020

<https://niwa.co.nz/climate/seasonal-climate-outlook/seasonal-climate-outlook-october-december-2020>

### Environment Canterbury

#### Essential Fresh Water Package – Environment Canterbury Advice

<https://ecan.govt.nz/your-region/your-environment/water/canterburys-water/essential-freshwater-package-our-advice/>

<https://www.youtube.com/watch?v=i-SX3NCrSUG&feature=youtu.be>

## Attachments

Nil

**10 Consideration of Urgent Business Items**

**11 Consideration of Minor Nature Matters**

**12 Closing Karakia**