ORARI-TEMUKA-OPIHI-PAREORA WATER ZONE MANAGEMENT COMMITTEE

on

Monday 21 November 2016

1pm

Meeting Room1
Timaru District council
2 King George Place
Timaru

ORARI-OPIHI-PAREORA WATER ZONE MANAGEMENT COMMITTEE

Notice is hereby given that an Orari-Temuka-Opihi-Pareora Water Zone Management Committee meeting will be held on Monday 21 November 2016 at 1pm, in meeting room 1, Timaru District Council, 2 King George Place, Timaru.

Committee Members:

John Talbot (Chairman), David Anderson, Kylee Galbraith, John Henry, Mandy Home, Ivon Hurst, Richard Lyon, Hamish McFarlane, Anne Munro, James Pearse, Ad Sintenie and Mark Webb

ORARI-TEMUKA-OPIHI-PAREORA WATER ZONE MANAGEMENT COMMITTEE

21 NOVEMBER 2016

1		**Apologies**
2		**Register of Interest**
3		**Community Forum**
4	**1**	**Confirmation of Minutes**
5		**Facilitator Update**
6	**6**	**Introduction to Central South Canterbury Water Group**
7	**7**	**Introduction to Opuha Water Ltd**
8	**15**	**Introduction to Geraldine Water Solutions**
9	**17**	**Orari-Temuka-Opihi-Pareora Zone Water Infrastructure Modelling Project Update**
		Afternoon Tea
10		**District Plan Review Process Update**
11	**20**	**Proposed Practical Action Plan**
12	**21**	**Immediate Steps Biodiversity Projects**
13		**Catchment Group Update**
14		**Regional Committee Update**
15		**Close**

ORARI-TEMUKA-OPIHI-PAREORA WATER ZONE MANAGEMENT COMMITTEE

FOR THE MEETING OF 21 NOVEMBER 2016

Report for Agenda Item No 4

Prepared by Joanne Brownie
Secretary

Confirmation of Minutes – Committee Meeting 3 October 2016

Minutes of the October Committee meeting.

Recommendation

That the minutes of the Committee meeting held on 3 October 2016, be confirmed as a true and correct record.

ORARI-TEMUKA-OPIHI-PAREORA ZONE WATER MANAGEMENT COMMITTEE

MINUTES OF AN ORARI-TEMUKA-OPIHI-PAREORA ZONE WATER MANAGEMENT COMMITTEE MEETING HELD IN THE TEMUKA PIPE BAND ROOMS, DENMARK STREET, TEMUKA ON MONDAY 3 OCTOBER 2016 AT 1.30PM

PRESENT John Talbot (Chairperson), David Caygill, Kylee Galbraith, Mandy Home, Ivon Hurst, Richard Lyon, Hamish McFarlane, James Pearse, Ad Sintenie

APOLOGIES Evan Williams and Mark Webb

IN ATTENDANCE Olivia Smith (Facilitator), Dan Clark (Senior Hydrology Scientist and Technical Lead)(until 3,35pm), Lyn Carmichael (ECan Planner Community Lead), Raymond Ford (Principal Planner), Michael Hide (Zone Implementation Team Manager), Nic Newman (Facilitator), Katherine Trought (ECan Director Communications), Tania Butterfield (ECan Communications), Helen Risk (ECan Land Management Advisor), Peter Scott (Regional Committee), Janet Gregory and Chanelle O'Sullivan (NZ Landcare Trust), Jeremy Boys (Opuha Water Ltd), John Benn (Department of Conservation), Ashley Harper (Timaru District Council Group Manager District Services)(until 3.35pm), Charley Solomon-Rehe (Te Runanga Arowhenua), Prue Thirkettle (National Council of Women), Ad Hendriks, Denzil Paterson, Frank Scarf, Frank Ledingham, Helen Tatham (Timaru Herald)

1 REGISTER OF INTERESTS

There were no additional interests advised.

2 CONFIRMATION OF MINUTES

Proposed Richard Lyon
Seconded Hamish McFarlane

"That the minutes of the Orari-Temuka-Opihi-Pareora Water Zone Management Committee meeting held on 5 September 2016 be confirmed as a true and correct record."

MOTION CARRIED

3 CORRESPONDENCE

The Chairman tabled a letter from Peter Woodnorth for the Committee's information. The letter presented Mr Woodnorth's opinions and asked questions on OTOP's Community Outcomes. The Chairman will respond.

4 PUBLIC WORKSHOP ROUNDUP

Lyn Carmichael gave a presentation on the Healthy Catchments Project current state engagement. The three public meetings held recently were attended by a good cross section of the community. The presentation listed the issues that had been raised, with a number of concerns being common to each meeting. Issues particular to the rural sector were separately set out. Lyn outlined the collective

action points and factors to be taken into account when considering solutions to the issues.

Comment was made that the discussion at the meetings concentrated on outcomes – having heard about the current state, attendees seemed to move straight to what the expected outcomes might be, rather than looking at whether the current state had been described accurately. On the positive side, the Committee could take from this that people are reasonably accepting of the accuracy of the assessment of the current state and the OTOP community outcomes.

The Committee needs to reflect on what has come out of these meetings in the planning of the next round, in terms of the focus and direction the meetings should take, and the level of information provided. It can be difficult when some attendees at these meetings have been involved for some time and have a reasonable knowledge of the issues while others are new to the subject. To try and address this problem, Lyn explained that the website is set up to deal with people who have different levels of understanding of the issue.

5 KEY DECISION AREAS OF CURRENT STATE

The Committee needs to think about the key decision areas in response to issues raised at the workshops on the current state. Are the aspirations adequately reflected in the Committee's Community Outcomes? The Committee generally agreed that the aspirations are aligned with the project outcomes.

The Committee discussed matters of concern to the community including water quality (swimable vs wadeable rivers), mahinga kai, irrigation and the nitrogen/nitrate issue. For the next public meetings it would be helpful to have clear information about nitrogen and other issues so that the meetings don't get narrowly focussed on nitrogen limits on farms.

Key issues identified included –

- Irrigation/freshes
- Phormidium – noting the challenge of how to communicate drivers of this issue
- Nitrogen/phosphate – understanding limits/standards
- Swimability/immersion/drinkability/wadeability - need to understand the differences in these standards
- Lack of water in the zone
- The need to understand natural flows
- Impact of birds nesting in headwaters (adding phosphate and nitrogen)
- Phosphorus loss as a result of erosion from floods.

The suggestion was made to create a living table, which collates information on issues, with relevant information (drivers and impacts) and tools/solutions that are both currently used and that could be used. Such a table could help to build understanding of the issues, prioritise key areas that need more attention and work towards integrated solutions. There was some discussion as to whether the table would be more a tool for staff rather than at a governance level. It was agreed that a table be developed for consideration at the next workshop.

6 WAITARAKAO WASHDYKE TASKFORCE REPORT

Facilitator Nic Newman spoke to his report on the work of the Waitarakao Washdyke Taskforce, which is charged with improving the outcomes for the

lagoon. The taskforce is looking at what actions can be taken immediately, while also considering longer term actions. Already the taskforce has made some progress. The report set out a priority action plan for the Committee's approval.

Proposed Kylee Galbraith
Seconded Richard Lyon

"That the Committee endorses the Waitarakao Washdyke Lagoon Action Plan and considers integrating the plan into OTOP's solutions package."

MOTION CARRIED

7 IMMEDIATE STEPS BIODIVERSITY FUND REVIEW – DELEGATION OF SMALLER PROJECTS TO ZONE MANAGER

The Committee considered a report by the Zone Delivery Manager on the possibility of the approval of smaller biodiversity projects under the Immediate Steps scheme, being delegated to the Zone Manager. In regard to the concern that a large portion of the IMS fund could be spent on numerous small projects, the Committee was advised that there are not many projects that fall below the $5,000 upper limit.

Proposed Richard Lyon
Seconded David Caygill

"That approval be granted for the Zone Delivery Manager to approve Immediate Steps Biodiversity projects up to the value of $5,000, with a total allocation cap of $20,000 per year, subject to each project meeting an ecological score of greater than 20."

MOTION CARRIED

A report on allocations made under delegated authority, will be presented to each Committee meeting.

8 ZONE DELIVERY TEAM UPDATE

Michael Hide gave a brief update on recent activities of the zone delivery team including the appointment of Helen Risk to the position of Land Management Advisor, progress with the water metering and water data processing, region wide fish barrier consent, inanga spawning programme, and new web site – wwwcanterburywater.farm which helps inform people on how the rules will affect farmers now and how the rules may affect farmers in the future.

The Committee requested information on the proportion of meters being monitored in real time.

9 CATCHMENT GROUP UPDATE

The Committee received an update on catchment group activities in the zone. A catchment group facilitators meeting was held on 6 September. In addition to the summary of coming activities presented in the agenda, the meeting was informed of an irrigation meeting held at Lincoln aimed at improving knowledge and understanding regarding good management practice to push for this season, and a half day irrigation training day for people outside the scheme. Catchment group meetings for Te Ngawai, Orari, Pareora, Waihi, Lower and Upper Opihi are coming up, catchment group members are encouraged to attend the Healthy

Catchment meetings, a Farm Environment Plan workshop is being organised at Albury in November and a smart map for biodiversity is being prepared.

Brochures are being produced for each catchment group with a localised map of that catchment, what the water quality in that catchment is like, key issues the group has identified, what they want to improve and key messages around good management practice and biodiversity. These brochures will be used to promote what is happening in those areas and encourage more involvement by members of each catchment.

10 DECISION ON EEL QUOTAS

The Committee considered a report by the Regional Committee Facilitator on the recent decision of the Minister of Primary Industries on eel quotas.

11 REGIONAL COMMITTEE UPDATE

Regional Committee member Peter Scott provided a brief update on what the regional committee is doing. The regional water infrastructure group has met, with representatives of Rangitata South Irrigation Ltd, Rangitata Diversion Race, Opuha Water Ltd and Hunter Downs. To meet the Water Management Strategy and take into account climate change, it is considered that more water will be needed to meet the required minimum flows, enhance lowland streams, maintain reliability of supply and taking into account the consented irrigation takes. A number of factors are still to be worked through including how the water will be brought to the district, who will pay and political constraints associated with bringing in new water. The information that is being put together will be useful for the OTOP Committee as it looks at future scenarios.

12 FACILITATOR UPDATE

The Facilitator advised that

- Silver Fern Farms has invited OTOP to a site visit on Monday 17 October in the afternoon. An OTOP workshop could then be held in the morning.
- On 7 November, the scheduled day for the next OTOP Committee meeting, a field trip will be held to the Upper Rangitata to look at the predator and weed control programme.
- The next OTOP meeting will therefore be held on Monday 21 November.
- The next round of public workshop proposed dates will be circulated.

13 END OF COUNCIL TERM

Commissioner Caygill noted that this is the last OTOP meeting before the local body elections on 8 October which means some local authority representatives may not be back on the Committee. He thanked the Committee for the opportunity to work with OTOP and wished the Committee well for the Healthy Catchments Project. The Chairman thanked Commissioner Caygill for his contribution.

In closing the meeting the Chairman thanked members for their attendance and acknowledged the runanga's assistance with making the field trip to the Maori Rock Art site possible.

Mandy Home gave a karakia and the meeting closed at 4.20pm.

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Chairperson

ORARI-TEMUKA-OPIHI-PAREORA ZONE WATER MANAGEMENT COMMITTEE

FOR THE MEETING OF 21 NOVEMBER 2016

Report for Agenda Item No 6

Prepared by **Jeremy Boys**
Central South Canterbury Water Group (AWT / Tekapo water)

Introduction to Central South Canterbury Water Group

Purpose of Report

To introduce the Zone Committee to the Central South Canterbury Water Group, including:

- An update on "Tekapo Water"
- An overview of recent infrastructure concept work and costings
- Land use assumptions provided for inclusion in ECan modelling.
- Integration with OTOP "new water scenario"
- Questions - Challenges & Opportunities arising for South Canterbury.

A verbal report will be presented to the Zone Committee at the meeting.

Recommendation

That the Committee receives the report.

ORARI-TEMUKA-OPIHI-PAREORA ZONE WATER MANAGEMENT COMMITTEE

FOR THE MEETING OF 21 NOVEMBER 2016

Report for Agenda Item No 7

Prepared by **Tony McCormick**
Chief Executive
Opuha Water Ltd

Introduction to Opuha Water Ltd

Purpose of Report

To introduce the Zone Committee to Opuha Water Ltd (OWL) and provide an understanding of the physical assets, the current plans and rules and how they influence the operation, and the opportunities OWL sees as we move into the Sub-Regional Plan preparation.

Background

Opuha Water Ltd (OWL) wishes to engage with the OTOP Zone Committee through the Sub-Regional Plan process to assist in the development of a Plan with the best environmental outcomes, consistent with the expectations of the communities within the Zone.

OWL are very aware of the significance of the water storage facility at Lake Opuha and the impact it has on the rivers and general environment on the downstream catchment. We believe that we have a situation that is almost unique in New Zealand where the operation of a facility, such as the dam, can be used to have such a direct effect on the downstream catchment. While the company recognises the responsibility that comes with the ownership and operation of the facility, and the constraints imposed and protection provided by the existing plans and rules that govern the operation, we are very keen to ensure that the key parties involved in the sub-regional process are well informed on the company's operation and, importantly, the opportunities that exist to build on the experience of operating the facility for over 17 years.

The company welcomes the opportunity to present to the Zone Committee on the 21st November and then to host the committee on a field trip to the lake and dam on 5th December. At the initial presentation, we hope to provide an understanding of the physical assets, the current plans and rules and how they influence the operation, and the opportunities OWL sees as we move into the Sub-Regional Plan preparation. In later presentations to the Zone Committee, we intend to focus more on the land based activities of our shareholder farmers.

On the field trip, there will be the opportunity to see and better understand the physical assets at the dam and we intend to demonstrate the capability of recently upgraded downstream weir.

The following is a summary of the presentation for the 21st November

INTRODUCTION TO OPUHA WATER

Opuha Water Ltd owns and operates the Opuha Dam and Power Station as well as downstream irrigation distribution infrastructure. The Opuha scheme plays a vital role in sustaining the in-river flows in the Opuha and Opihi Rivers while supplying reliable water to its irrigation shareholders and to the Timaru region's water users. The Opuha Dam officially opened in November 1998.

Opuha Water Ltd is a cooperative company owned by its 220 irrigator shareholders with a Board comprising five farmer shareholders Directors and two independent Directors. It has a management and operation staff of seven, based at the office/depot near Pleasant Point.

There are 16,000 shares held by OWL's 220 irrigator shareholders. Each 'share' represents an allocation of water that is considered adequate to irrigate one hectare of land for the irrigation season. So the Opuha scheme enables the irrigation of 16,000ha.

<u>The Opuha Scheme</u>

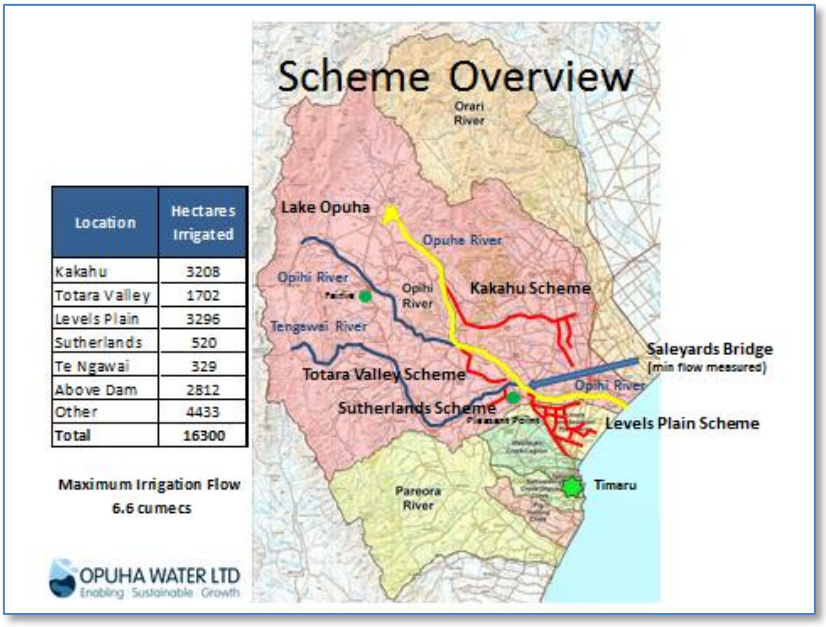
The dam that is located just downstream of the confluence of the North and South Opuha rivers. There are also other natural inflows into the lake including Ribbonwood and Station streams. The catchment for the lake extends along the Two Thumb Range – essentially from Mt Dobson through north of Fox Peak. It is a lowlands hills, eastern facing catchment.

The lake holds up to 72,000,000m^3 of water when full and extends over approximately 700ha.

The dam releases water into the Opuha River which joins the Opihi at Raincliff.

There are three irrigation schemes that draw water from the Opuha and Opihi Rivers and there are also shareholder irrigators who operate directly off those two rivers as well as the Te Ngawai, the Upper Opihi and the rivers and streams above the dam. OWL holds consents for each of the schemes to divert water from the river and those irrigators that take directly from rivers or affiliated wells have individual consents for their water takes.

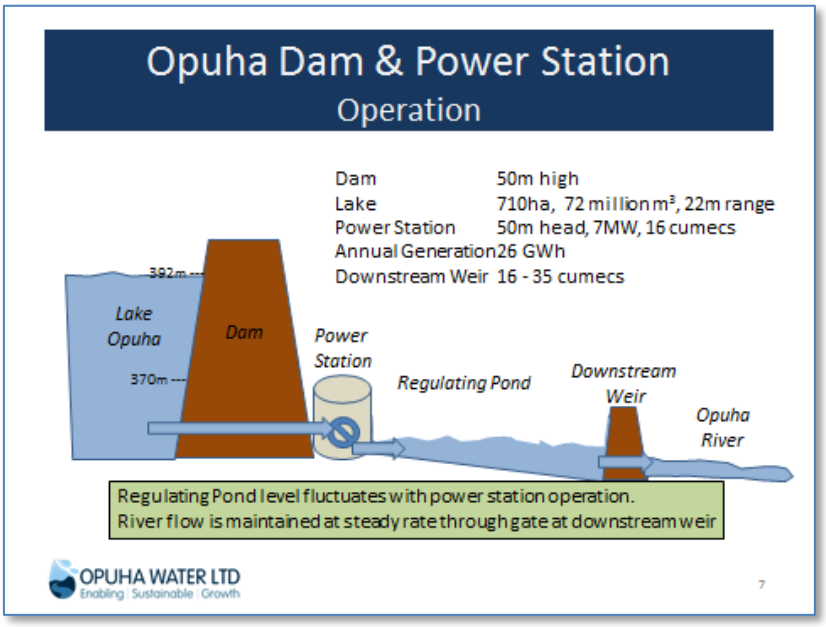
The land use across OWL irrigators comprises approximately 54% dairy, 23% drystock and the remaining 23% spread across mixed cropping, vegetables, lifestyle blocks and some other small activities.



Water Storage Facility

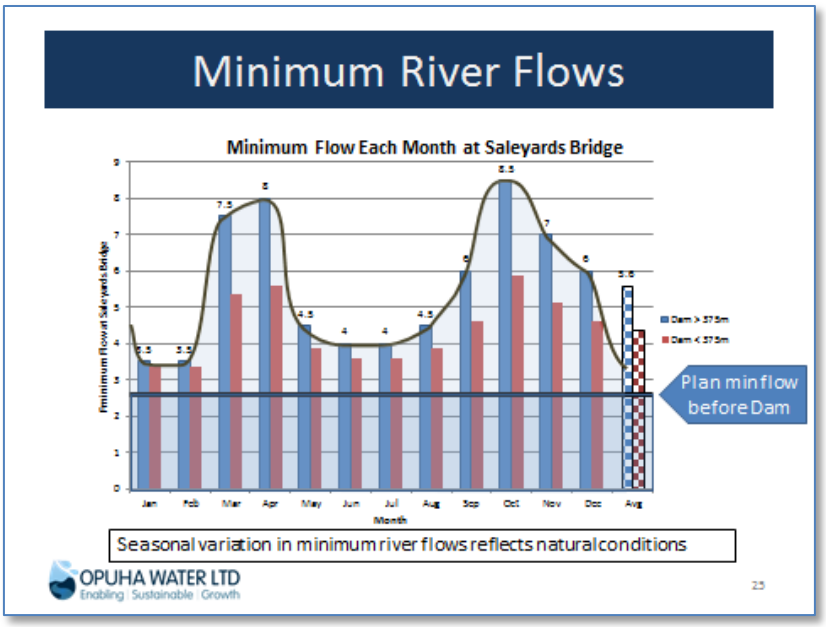
The dam is a 50m high, 300m wide earth embankment dam and the outlet from the lake is located just upstream of the dam, at the bottom of the lake. The lake has an operating range of 22m.

Under normal conditions, all water released from the lake is run through the power station which has a capacity of 7MW with a flow rate of 16 cumecs. The Power station releases into a downstream regulating pond and, from there, water is released through the downstream weir into the Opuha River. The regulating pond enables the power station to be run at its most efficient load and economic times while the river flow can be regulated to meet the downstream requirements.



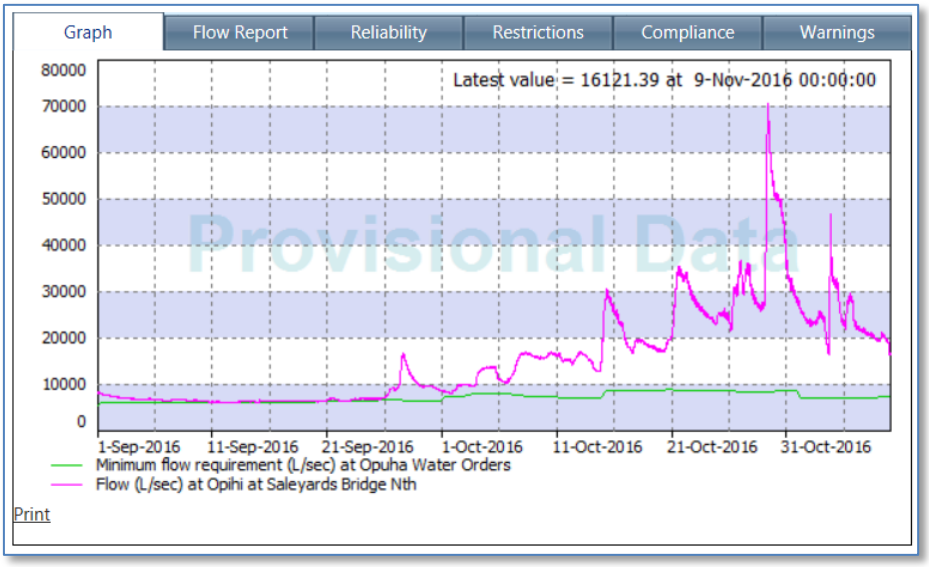
Opihi River Regional Plan (ORRP) - Flow Regime

The key operating 'rules' are prescribed in the ORRP with the key component being the flow regime that specifies, for each month, a river minimum river flow at the bottom of the catchment at a monitoring site near Saleyards Bridge (SYB). OWL owns and maintains this flow measurement site. This flow regime was developed in consultation with, mainly, Fish & Game, as part of the initial consent application for the dam.

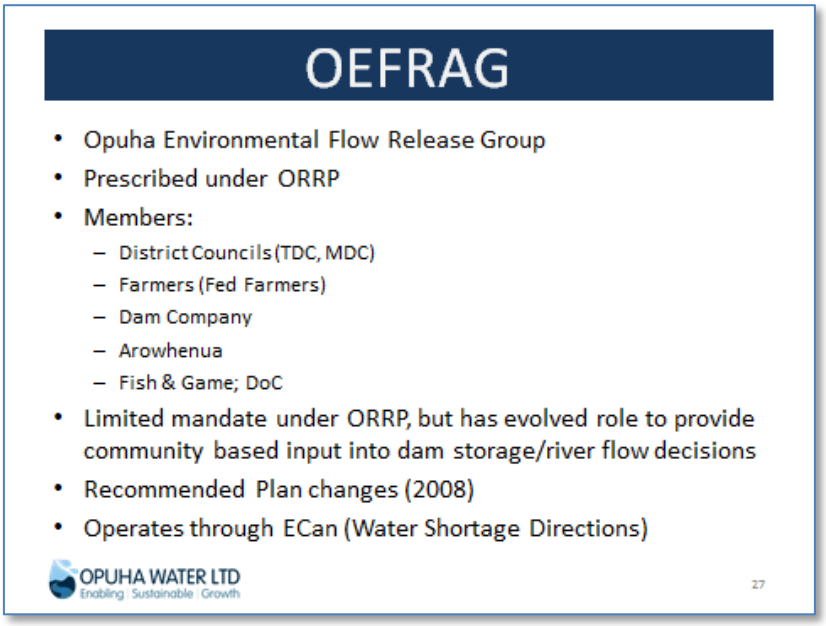


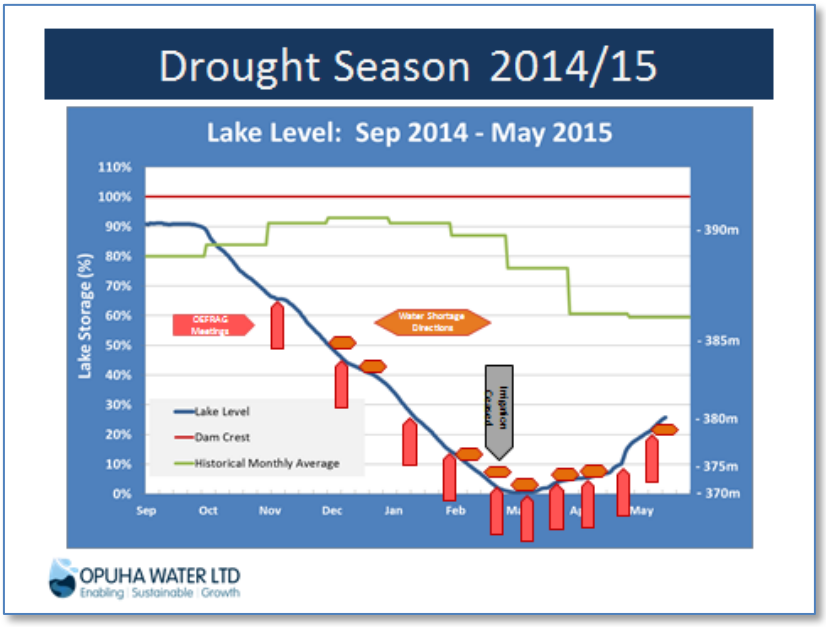
OWL's operating consent requires the company to operate the dam facility and release enough water to provide for the abstractions from the river and to ensure that the prescribed minimum flows are achieved at SYB. Since there are abstractions for irrigation below the flow site at SYB (such as the Levels Plain scheme), the actual flow that OWL maintains at SYB is the minimum flow PLUS the irrigation abstractions below the site.

There are often times when the actual flow at SYB is far in excess of the prescribed minimum flow. This occurs when the natural inflows into the catchment below the dam (ie Opihi River and Te Ngawai River in particular) exceed the required minimum flow and/or the company is releasing extra water from the dam to control the lake level.



In times of water shortage the Opuha Environmental Flow Release Advisory Group (OEFRAG) provides a community forum where decisions can be made on the short term operation of the dam, flows in the river and restrictions on irrigators. This group has been particularly active over the last two seasons and, we believe, has provided something of a template for effective adaptive management of the scheme and river which has provided tremendous results for the environment and stakeholders.





Adaptive Management - Flow Regime

It is generally recognised and accepted that damming a main stem river can have adverse effects on the river downstream of the dam due to the modification of the river flow regime. OWL has an on-going programme of science based studies where we are endeavouring to understand the effect of the dam and the flow regime and, in particular, to identify if there are better ways of operating the dam to provide better environmental outcomes downstream.

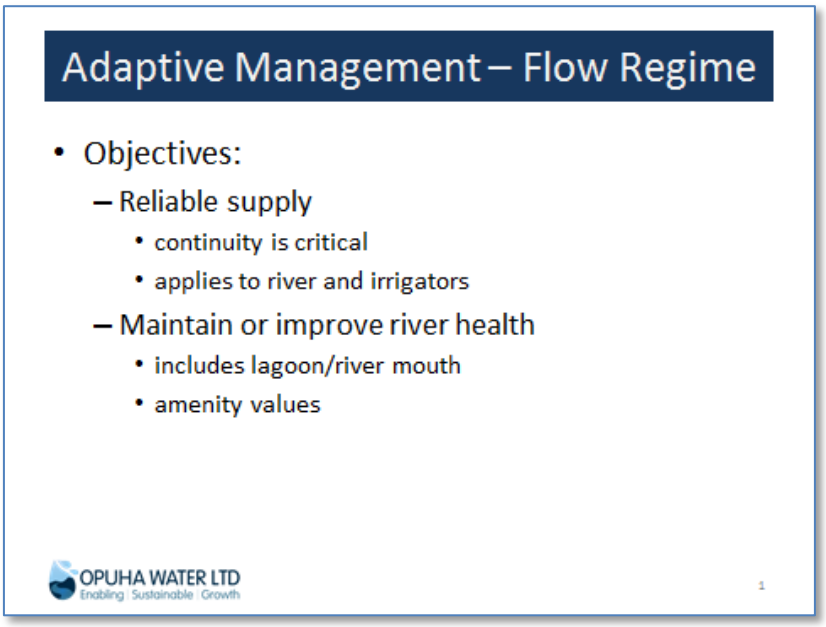
As well as monitoring periphyton (algal) growth in the rivers, there have been a series of tests undertaken on the effectiveness of 'flushing flows' where high flows are released for a short period from the downstream weir in an effort for scour/flush out nuisance periphyton. Included in these tests and the monitoring have been assessments of how flow variability (or lack of it) impacts the health of the river and extent of algal growth. It is reasonably apparent that extended periods of constant flow, especially low flow in warmer conditions, are the best conditions for algal growth. Flow variability – that may include periods of very high and even very low flows – is seen as a key to managing for better river health.

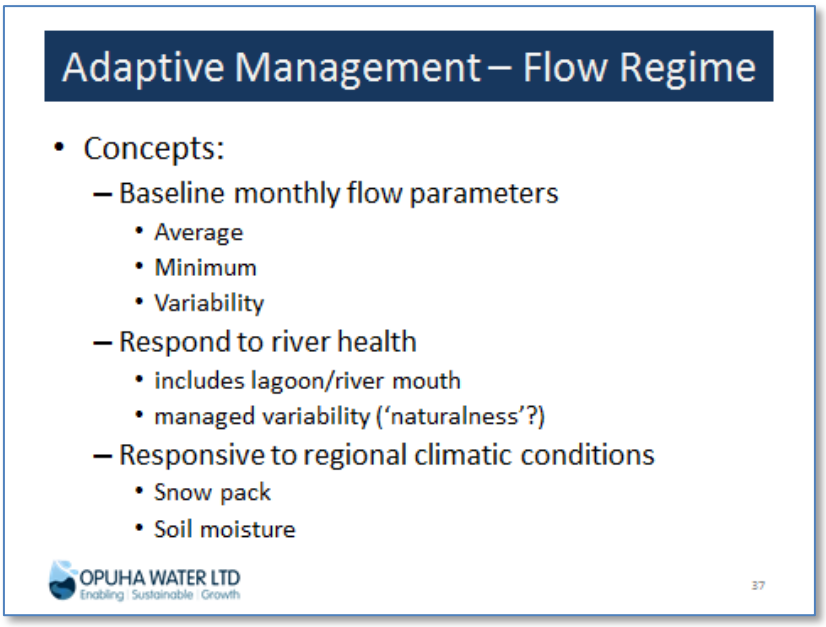
The experience of the recent drought seasons has provided valuable information on just how low flows in river can be taken for short periods with the river still remaining 'viable' and this is seen as potentially another aspect to managing for overall better river health.

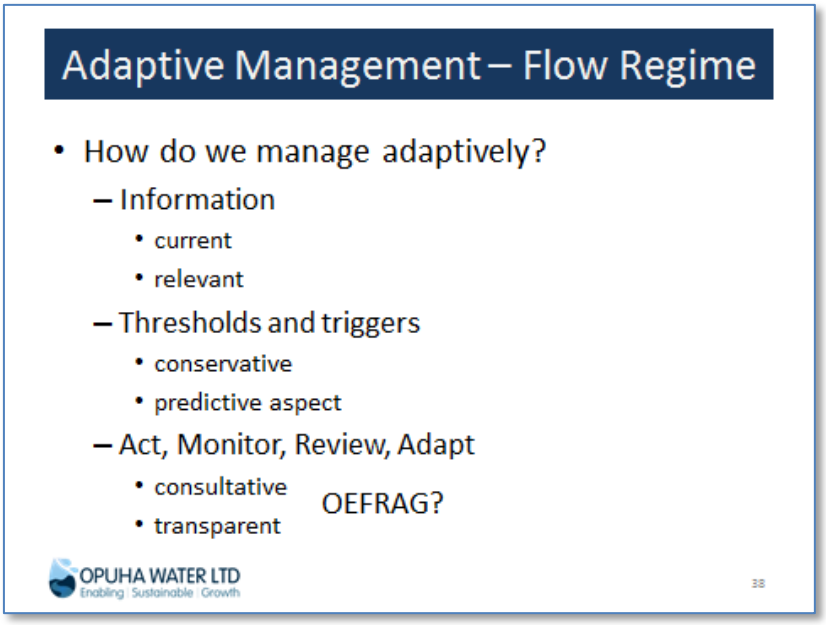
OWL is very willing to share the knowledge and experience that has been gained through the operational experience (including with OEFRAG) and the continuing scientific investigations in an effort to identify how a better operational regime might be developed to improve the river health while still meeting the needs of the many stakeholders in the river.

We recognise the challenges involved in writing an 'adaptive management regime' into a Plan (the Sub-Regional Plan) and we have engaged directly with the planning staff at ECan to work with them in exploring this opportunity.

The flow regime in the river is only one part of the challenge and puzzle we face as a community in the Sub-Regional Plan process, but it is OWL's view that we have some exciting and unique 'tools' (hardware such as the dam and downstream weir but also processes such as OEFRAG) and collective knowledge and experience to proactively manage the river to improve the river and reduce adverse impacts. We also recognise that there are limitations with just what can be achieved with the existing facilities – for example when water can be available and just how much can released.







Conclusion

Opuha Water Ltd (OWL) wishes to engage with the OTOP Zone Committee through the Sub-Regional Plan process to assist in the development of a Plan with the best environmental outcomes, consistent with the expectations of the communities within the Zone.

The Opuha Scheme is a very significant element in the overall performance of the Opihi catchment.

There has been a significant amount of operational experience and scientific knowledge gained since the Opuha Dam was commissioned and OWL is keen and willing to share this information and knowledge to develop a better river flow management regime as part of the Sub-Regional Plan process.

This initial presentation to the OTOP Zone Committee along with the subsequent field visit, is intended to help ensure there is a good understanding of the scheme – and in particular its key facilities and their operational capabilities and limitations.

Recommendation

That the Committee receives the report.

ORARI-TEMUKA-OPIHI-PAREORA ZONE WATER MANAGEMENT COMMITTEE

FOR THE MEETING OF 21 NOVEMBER 2016

Report for Agenda Item No 8

Prepared by **Nick Ward**
Chairman
Geraldine Water Solutions

Introduction to Geraldine Water Solutions

Purpose of Report
To introduce the Zone Committee to Geraldine Water Solutions (GWS), and provide an understanding of the establishment of the group, its members, aims, and activities to date.

Background
Geraldine Water Solutions (GWS) is a farmer initiated group which was formed by consent holders earlier this year to investigate the opportunity to bring water from our Northern counterparts into South Canterbury, centred around the Geraldine area e.g. North Coopers Creek, South Geraldine flat, Temuka-Winchester, and East Orari/Clandeboye/Milford.

This would be consented water from either Klondyke of Lake Coleridge

The Committee
- Nick Ward (Chairman)
- Mark Mulligan (Vice-Chairman)
- Hayden McKenzie
- James McDonald
- Milne Horne
- Grant Tremewan

Aims of GWS:
- To facilitate information to assist the understanding of the potential future supply risks.
- To coordinate with other catchments such as Opuha.
- To continue working with ECAN who supplied initial water supply information, investigating work and resources.
- To facilitate small farmer group meetings (Pod groups) with the assistance of ECAN to take this proposed scheme to the next stage.
- Raising capital for a full feasibility study.
- To increase awareness of farmer regulatory requirements.

Progress to date
Demand Survey
A Demand Survey of current consent holders took place in late 2015. 61 surveys were returned. Potential new irrigators were also identified and surveyed. These

respondents covered 9,500 irrigated hectares that had potential for irrigation. Survey results indicated:

- 82% would consider 'top up' reliability water
- 35% would consider total replacement supply
- 37% would consider additional supply.

Consent holder meetings

Two meetings of consent holders from the Temuka and Orari catchments have held in Geraldine. These have provided farmers with information about GWS as well as the current and future planning frameworks and local climatic predictions.

The next step will be to run some cowshed/woolshed 'pod meetings' to start talking more detail with farmers and guage the willigness of farmers to fund a full feasibility study.

Recommendation

That the Committee receives the report.

ORARI-TEMUKA-OPIHI-PAREORA ZONE WATER MANAGEMENT COMMITTEE

FOR THE MEETING OF 21 NOVEMBER 2016

Report for Agenda Item No 9

Prepared by **Brett Painter**
Project Leader CWMS Assessments and Evaluations
Environment Canterbury

OTOP Water Infrastructure Modelling

Purpose of Report

Provide an update on the Orari-Temuka-Opihi-Pareora (OTOP) Zone Water Resource Modelling project to deliver OTOP Zone Implementation Programme (ZIP) water infrastructure objectives.

Background

The OTOP Zone Committee has previously considered a number of ideas for future water management in the OTOP Zone and the assessment of some of these ideas against the Canterbury Water Management Strategy (CWMS). An initial water quality study was completed in 2014 and a follow up water resource modelling study was initiated in 2015. This water resource study is currently running a series of experiments and checking experimental results with relevant members of the local communities. Learnings from this study are informing the scenarios being developed for the OTOP Healthy Catchments Project as well as potential infrastructure developments.

Water Resource Computer Model

The objectives of the OTOP Zone Water Resource Model are to investigate the potential for 'new' water supply into the OTOP Zone (initially considering a portion of Rangitata Diversion Race (RDR) consented water) and OTOP in-zone gains to:

- Improve lowland stream health;
- Improve Opuha/Opihi River system health;
- Maintain or improve supply reliability for drinking, stock and irrigation supply;
- Identify additional potentially irrigable areas for further assessment.

A water balance computer model has been developed to investigate the effects of current and potential combinations of water management rules, supply, demand and infrastructure. Concepts for progressing the model objectives were discussed at numerous meetings through 2015 with the zone committee, Regional Infrastructure Working Group of the CWMS Regional Committee, rūnanga, local communities, infrastructure developers and providers. An overview of the modelling project was presented at the August 2016 OTOP Zone Committee meeting.

Figure 1 shows the framework of the OTOP Zone Water Resource Model. It includes current infrastructure (storage and conveyance) from the Opuha Water scheme and Rangitata South Irrigation Scheme (RSIS). It also includes the current Rangitata Diversion Race conveyance infrastructure and Lake Coleridge. Lake Coleridge is included as it can potentially supply additional water to the northern extent of the RDR scheme, thus enabling the equivalent Rangitata water to be distributed to the OTOP

Zone. The model is run for the historical time period from 1981-2011 and assumes all current infrastructure was in place for this whole time period. This enables us to analyse OTOP Zone water management challenges and opportunities over a wide variety of climate examples.

Potential future storage and conveyance infrastructure is included to cover a range of possible future supply concepts. Further in-scheme and on-farm storage is included in the model but not shown on the figure. As the model is conceptual rather than map-based, the location of any potential new infrastructure does not need to be determined at this time. The model also includes consent information and river/scheme operating rules. The potential demand area is divided up into many potential demand zones based on climate, location and soil type.

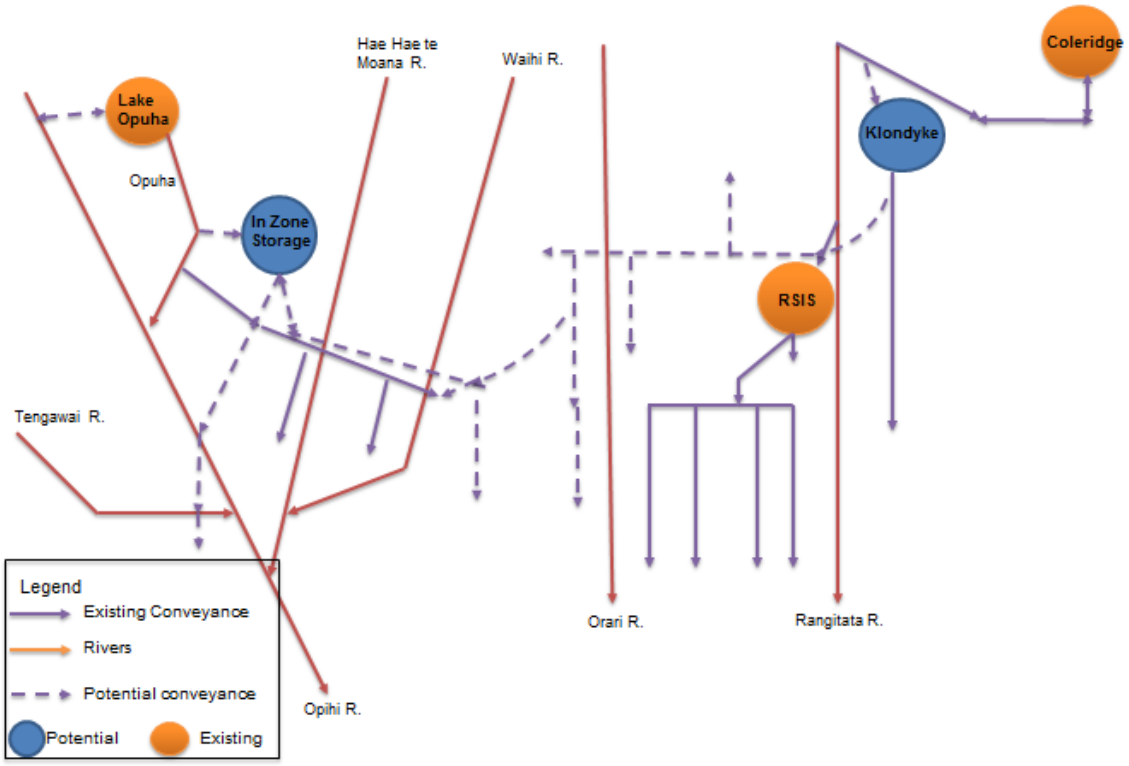


Figure 1. OTOP Computer Model framework

The first set of experiments focussed on the coastal zone between the Rangitata and Opihi Rivers. These experiments were informed by a demand survey of current consent holders conducted in late 2015. The results of these experiments were presented at the August 2016 OTOP Zone Committee, but are summarised below.

Survey respondents covered 9500 irrigated hectares and 1700 hectares of new potential irrigation. Survey results showed:

- 82% would consider 'top up' reliability water (to 95% reliability);
- 35% would consider total replacement supply (including 400 l/s at the end of the Kakahu Irrigation Scheme);
- 37% would consider additional supply.

A number of "new water" experiments were run. Two key experiments were:

- Infrastructure and water requirements to respond directly to the demand survey. To achieve 95% supply reliability to all modelled years required a new

pipeline with maximum capacity of 1.9 m^3/s, new on-farm storage totalling 500,000 m^3 and 19 M m^3 per year of scheme storage. If this level of supply reliability was only required in 80% of modelled years, then the scheme storage could reduce to 17.2 M m^3 per year.

- Infrastructure and water requirements to fully replace all existing groundwater consents greater than 5 l/s and full replacement of 400 l/s from the lower Kakahu Scheme as a "Significant New Water" example. Modelling suggested that new on-farm storage could remain at 500,000 m^3, maximum pipeline capacity would increase to 2.6 m^3/s, and scheme storage would increase to 26.4 or 30 M m^3 per year for 80 % or 100 % of modelled years respectively.

Current model experiments are focussing on the Opuha/Opihi system. The scope of these experiments has been determined through discussions with local water managers and decision makers. These experiments are exploring:

- Potential challenges and opportunities of operating Lake Opuha to design maximum level.
- Potential challenges and opportunities of an upper Ashwick canal to provide additional supply to Lake Opuha from the Opihi River.
- Potential adaptive management concepts for Lake Opuha/Opuha Water and Opihi River release rules.
- Effects of adding 10 days of on-farm storage to Opuha Water shareholders.
- 'New' supply opportunities (eg, re-allocation of 400 l/s Kakahu Scheme supply)
- Potential effects of new demand (e.g., top up reliability, enforced demand from new minimum flows and/or 150 day stream depletion assessments, new irrigated area).
- Potential challenges and opportunities of piping/lining Levels Plains scheme.
- Potential benefits of soil moisture deficit-based demand rather than just taking full allocation when available.

The results of these experiments are currently being analysed, and confirmed results will be presented at the November OTOP Zone Committee meeting. A third set of experiments that combine the most promising concepts from the first two sets of experiments is also underway. A follow up project to consider commercial, design and cost implications is under discussion.

Recommendation

That the Committee receives the update.

ORARI-TEMUKA-OPIHI-PAREORA ZONE WATER MANAGEMENT COMMITTEE

FOR THE MEETING OF 21 NOVEMBER 2016

Report for Agenda Item No 11

Prepared by Michael Hide
Zone Manager)

Proposed Practical Action Plan

Purpose of Report
To propose a Practical Action Plan for the Committee to consider endorsing.

Background
In late 2015 the zone committee established some '5 year outcomes and milestones' for water management in the OTOP zone. A 5 year work programme was then to be developed to help coordinate action to deliver these outcomes and milestones.

The development of this work programme has been restricted due to limited resource in the Zone Delivery Team. The recent appointment of a full time Land Management Advisor for the OTOP zone means there is now resource to help coordinate the development and implementation of a focused work programme.

At a zone committee workshop in October 2016, Michael Hide suggested his team develop a short term practical action plan (now- Sept 2017) in place of a 5 year work programme. This short term plan is intended to better align with the timeframes of the Healthy Catchments Project and the Landcare Trust 'Working for Opihi Water' Project. This short term plan would then be revised upon the completion of the ZIP addendum in September 2017.

Several committee members supported the concept and recommended that the action plan be focused on:

- actions/easy fixes that can be achieved by Sept 2017 to help build a sense of momentum and achievement within the community
- addressing hotspots/focus on specific geographic areas
- supporting the application of knowledge acquired from catchment group/industry field days on farm.

A draft practical action plan will be presented at the zone committee meeting.

Recommendation

That the Committee considers endorsing the Practical Action Plan.

ORARI-TEMUKA-OPIHI-PAREORA WATER ZONE MANAGEMENT COMMITTEE

FOR THE MEETING OF 21 NOVEMBER 2016

Report for Agenda Item No 12

Prepared by Robert Carson-Iles
Biodiversity Officer
Environment Canterbury

Immediate Steps Biodiversity Projects

Purpose

The purpose of this agenda paper is to propose three new Immediate Steps (IMS) project for zone committee decision.

Recommendation

The committee consider approving funding for the three projects.

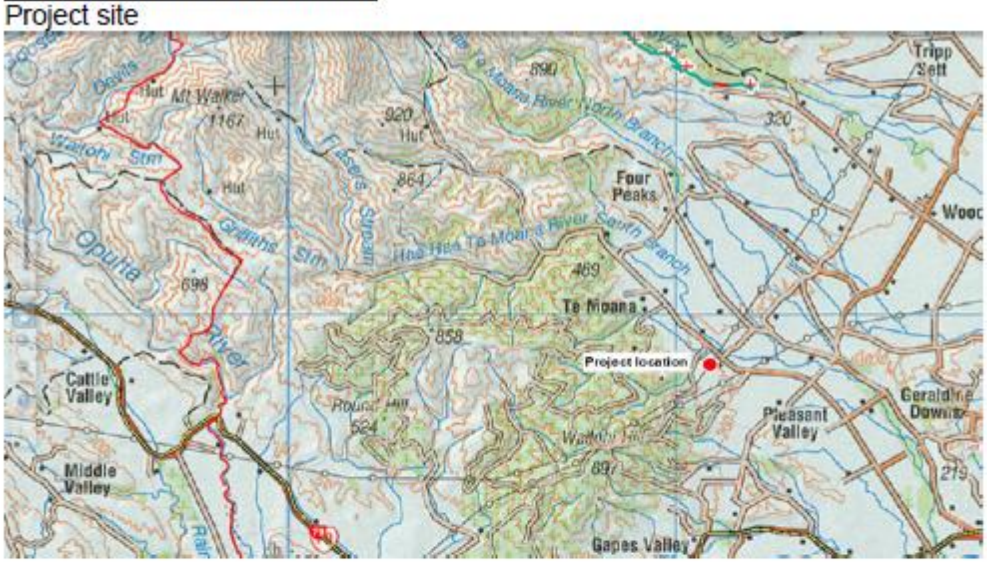
Attached

- Background project information for zone committee decisions and recommendations for funding.
- Updated summary of IMS funding

Attachment 1: Project information for funding decision

Te Moana Kanuka Protection

Project site



Project Design





Proposed project	Project details in brief	Land tenure	Cultural Value	Ecological score	Funding requested (Total cost in brackets)
Te Moana Kanuka Protection	This project involves fencing off a 1.6ha block of mature Kanuka. Once stock are excluded the natural forest succession that is being halted by browsing will take place. The landowner has already been carrying out weed control in the block and will continue to do so. It is also their intention that the pasture margins of the block will be planted in native species.	Private	- **	27/39	$7,630 ($11,445)
Recommendations: The recommendation is to support this project. For a relatively minimal outlay this Kanuka remnant will be protected and natural forest succession means a mixed hardwood podocarp forest will eventually exist here, an ecosystem type that has been severely depleted in this environment. The remnant also provides habitat for a number of native bird species including kereru, rifleman, bellbird and grey warblers. The project is aligned with the Zone Implementation Plan (see below) 2.3.1 immediate steps funding - investing in projects that:... protect and enhance ecosystem integrity and function					

** Cultural assessment of the project is not completed prior to presentation to the zone committee – any comments from the cultural rep are appreciated during the meeting.

Glen Darach Wetland and Limestone Protection.

Project site:



Project Design:





Wetland and Cliff area

Proposed project	Project details in brief	Land tenure	Cultural Value	Ecological score	Funding requested (Total cost in brackets)
Glen Darach Wetland and Limestone protection	This project involves fencing off and protecting from stock browsing a large limestone cliff system with associated vegetation communities and a springfed wetland. The limestone area has numerous pieces of rock art, and provides habitat for a Nationally endangered grass species which specialises in limestone environments. The	Private	- **	36/39 (has not yet been peer reviewed)	$7,853 ($11,780)

	wetland is extensive and provides habitat for numerus long finned eel.				

Recommendations: The recommendation is to support this project. Limestone cliffs are a nationally rare ecosystem and this one provides habitat for a nationally endangered grass species. The wetland is large, provides habitat for eels and includes the springhead.

The project is aligned with the Zone Implementation Plan (see below)

Protect Dryland remnants 2.2.3- Increase public awareness of local biodiversity

Immediate Steps 2.3.1 - Invest Funding- provide early multiple biodiversity gains, protect and enhance ecosystems integrity and function. Priorities are- Wetlands, remnant habitats and their unique flora and fauna.

Significant indigenous vegetation and indigenous fauna 2.3.8 - Support initiatives to protect and manage remnant habitats and flora and fauna specific to this zone.

Frenchmans Gully Covenant Protection

Project Site:



Project Design:





Covenant area

Proposed project	Project details in brief	Land tenure	Cultural Value	Ecological score	Funding requested (Total cost in brackets)
Frenchmans Gully Covenant protection	This project involves fencing off and protecting from stock browsing a large limestone cliff system with associated vegetation communities. As with Glen	Private	- **	27/39	$10,950 ($16,420)

	Darach, the cliffs have rock art and provide habitat for a number of threatened plant species including being one of only two known sites where the Taiko gentian are found. The landowners are placing this site along with nearby limestone sinkholes (not part of this project) under the protection of a QEII covenant.				

Recommendations: The recommendation is to support this project. Limestone cliffs are a nationally rare ecosystem and this one provides habitat for a number of threatened plant species. Being placed under a QEII covenant means the site will be protected for perpetuity.

The project is aligned with the Zone Implementation Plan (see below)

Protect Dryland remnants 2.2.3- Increase public awareness of local biodiversity

Immediate Steps 2.3.1 - Invest Funding- provide early multiple biodiversity gains, protect and enhance ecosystems integrity and function. Priorities are- Wetlands, remnant habitats and their unique flora and fauna.

Significant indigenous vegetation and indigenous fauna 2.3.8 - Support initiatives to protect and manage remnant habitats and flora and fauna specific to this zone.

Attachment 2: OTOP Immediate Steps Project Summary

Application Year	Applicant	ECan Funding	External Funding	Status
2011/2012	Old Orari Lagoon	12,472	10,012	Completed.
2011/2012	Otipua Dune Restoration - Stage 1	8,645	23,808	Completed.
2011/2012	Deep Stream Year 1	20,000	10,000	Completed.
2011/2012	Henriksen's Bush	11,000	5,500	Completed.
2011/2012	Horseshoe Lagoon - Willow Control	5,607	3,293	Completed.
2011/2012	Peel Forest Wetland Yr 1	20,000	10,000	Completed.
2011/2012	Pit Road Lizard Sanctuary - Stage 1	20,360	12,694	Completed.
2012/2013	Deep Stream Year 2	20,000	15,000	Completed.
2012/2013	Opihi Catchment Environmental Protection Group	1,560	1,060	Completed.
2012/2013	Horseshoe Lagoon Fencing & Planting	10,000	5,000	In progress.
2012/2013	Otipua Dune Restoration - Stage 2	5,450	9,500	Completed.
2012/2013	Pareora Scenic Reserve Fencing Yr 2	20,000	21,000	Completed.
2012/2013	Peel Forest Wetland Year 2	19,500	10,000	Completed.
2012/2013	Albury Springs Enhancement	5,706	5,706	Completed.
2012/2013	Pit Road Lizard Sanctuary - Stage 2	10,000	5,070	In progress.
2012/2013	Pit Road Reserve Pine Tree Removal	10,000	4,500	Completed.
2012/2013	Rangitata Stone Row Relocation	2,131	2,400	Completed.
2012/2013	Upper Old Orari Lagoon	6,150	6,780	In progress.
2013/2014	Upper Old Orari Lagoon 2014 Planting	4,400	2,200	In progress.
2013/2014	Old Orari Lagoon 2014 Planting	1,335	1,675	In progress.
2013/2014	Opihi Catchment Environmental Protection Group 2013 Planting	3,863	2000	Completed.
2013/2014	Orakipaoa Tributary Plantings	2,500	4000	In progress.
2013/2014	Awarua Wetland Restoration	14,000	7,100	Completed.
2013/2014	Coopers Creek Willow Control	5,500	3,740	In progress.

2013/2014	Craigmore Covenant Fencing	22,266	11,134	In progress.
2013/2014	Hanging Rock Wetland Restoration	17,704	14,610	In progress.
2014/2015	Pit Road Lizard Sanctuary - Rabbit proof fencing	10,140	12,060	In progress.
2014/2015	White Rock Tributary Fencing	10,800	5,400	Completed.
2015/2016	Awarua Wetland Restoration Year 2	14,500	8,840	In progress
2015/2016	Connells Wetland enhancement	16,500	16,500	In progress
2015/2016	Upper Rangitata Predator control Project	20,000	176,091	In progress
2015/2016	Chamberlain wetlands restoration	13,445	6,723	In progress
2015/2016	Stanton Wetland	1,910	3,330	In progress
2015/2016	Springfield Wetland	26,310	22,771	In progress
2015/2016	Awarua Wetland Restoration Year 3	4,402	4,725	In progress.
2015/2016	Ohapi Springs	9,000	21,150	In progress.
2015/2016	Clarke Flat sycamore control (stage 1)	50,000	25,000	In progress.
2015/2016	Orari Gorge Weed Control	36,500	98,000	In Progress
2016/2017	Seadown Mataitai Project	7,400	5,200	Pending
2016/2017	Raincliff bat habitat project	29,722	23,269	In Progress
2016/2017	Crevale Wetland	16,850	8,426	In Progress
	TOTAL ALLOCATION	**547,628**	**645,267**	