

**ORARI-TEMUKA-OPIHI-PAREORA WATER ZONE
MANAGEMENT COMMITTEE**

on

Monday 21 August 2017

1.30pm

**Mocca Café Upstairs Meeting Room
Stafford Street
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 August 2017 at 1.30pm, at Mocca Café Upstairs Meeting Room, Stafford Street, Timaru.

Committee Members:

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

ORARI-TEMUKA-OPIHI-PAREORA WATER ZONE MANAGEMENT COMMITTEE

21 AUGUST 2017

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|----------|-----------|---------------------------------------|
| 1 | | Apologies |
| 2 | | Register of Interest |
| 3 | | Community Forum |
| 4 | 1 | Confirmation of Minutes |
| 5 | 5 | Waitarakao Washdyke Taskforce |
| 6 | 9 | Saltwater Creek Working Group |
| 7 | 35 | OTOP Community Engagement Plan |
| 8 | | Discussion and Questions |
| 9 | | Close |

ORARI-TEMUKA-OPIHI-PAREORA WATER ZONE MANAGEMENT COMMITTEE
FOR THE MEETING OF 21 AUGUST 2017

Report for Agenda Item No 4

Prepared by Joanne Brownie
Secretary

Confirmation of Minutes – Committee Meeting 3 July 2017

Minutes of the July Committee meeting.

Recommendation

That the minutes of the Committee meeting held on 3 July 2017, 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 AT SOPHEZE ON THE BAY, TIMARU, ON MONDAY 3 JULY 2017 AT 2.30PM

PRESENT John Talbot (Chairperson), Clr David Anderson, Kylee Galbraith, John Henry, Ivon Hurst, Clr Richard Lyon (until 4.50pm), Hamish McFarlane, Clr Anne Munro, James Pearse, Clr Lan Pham, Ad Sintenie and Mark Webb

APOLOGY Mandy Home

IN ATTENDANCE Barbara Nicholas (Facilitator), Barb Gilchrist (Facilitator), Dan Clark (Senior Hydrology Scientist and Technical Lead), Craig Davison (Senior Planner), Michael Hide (Zone Implementation Team Manager), Peter Constantine (Principal Planning Officer) Lyn Carmichael (Senior Planner and Community Lead), Shirley Hayward (Senior Water Quality Scientist), Kate Doran (ECan), Peter Ramsden (Tangata Whenua facilitator), Sue Eddington (Waihao), Janet Gregory (NZ Landcare Trust), Rhys Taylor (Community Engagement Coordinator), Kate Doran (ECan), Prue Thirkettle (National Council of Women), Clr Peter Scott (ECan), Clr Tom Lambie (ECan), Grant Hall (Timaru District council Drainage and Water Manager), Tony McCormick, Julia Crossman, Milne Horne (Opuha Water Ltd), representatives of Geraldine Water Solutions, representatives of Forest and Bird Society, Mark Oldfield, Dermott O'Sullivan, Elena McPhee (Timaru Herald).

1 REGISTER OF INTERESTS

There were no additional interests advised.

2 CONFIRMATION OF MINUTES – COMMITTEE MEETING 12 JUNE 2017

Proposed Mark Webb
Seconded Lan Pham

“That the minutes of the Committee meeting held on 12 June 2017 be confirmed as a true and correct record.”

MOTION CARRIED

3 FACILITATOR UPDATE

The new OTOP Facilitator Barb Gilchrist briefly reported that having been in the role for only 4 weeks, the work has been concentrated on preparation for the workshops toward the ZIP Addendum and the solutions package.

4 PLAN CHANGE 5

Craig Davison gave a presentation to the Committee on Plan Change 5 – explaining the outcomes, essential information, permitted and consented activities and the farm portal. Plan Change 5 gives certainty to farmers and

provides catchment accounting. How Plan Change 5 affects farmers, depends on individual circumstances and is site specific.

PC5 rules do not apply until it is made operative, however the policies apply now. PC5 requires farming activities to operate at GMP, but the GMP limits do not apply until 2020, what applies now, is the farm's baseline. He referred to the Good Management Practice booklet as an industry agreed guide to GMP.

The requirements around permitted activities were outlined, in particular the winter grazing limits, and the need to prepare a farm management plan which must include basic property information and on farm actions in regard to water, effluent, fertiliser application and storage, stock exclusion and riparian management. An explanation was provided as to when a resource consent is required and what you need to do if the farm requires a consent, working through the farm portal.

5 LANDCARE TRUST REPORT

The Committee considered the final report from the Landcare Trust on the OTOP catchment group project. The Chairman thanked Janet Gregory for her work on the project and the energy and attention she gave to the task, which has made a real difference. He noted that there has been some disappointment as to what the Committee originally expected from the project versus what was realistically achieved.

6 PRESENTATIONS

The following groups made presentations to the Committee -

Opuha Water Ltd (OWL)

Milne Horne (Chairman) and Tony McCormick (Chief Executive) gave a presentation in support of OWL's written report, on OWL's views on potential outcomes and solutions for the OTOP zone. The report included detailed recommendations on what OWL would like to see in the subregional plan. OWL would value further engagement with the Committee as part of the solutions process.

Geraldine Water Solutions (GWS)

Further to the GWS written report, Geraldine Water Solutions Chairman Nick Ward gave a presentation on the Geraldine Water Solutions group, which is a farmer initiated group formed by consent holders in 2016. The group has strong support from the farming community. The group is working towards funding a feasibility study to investigate bringing new water into the zone. The group believes that the new water scenario did not consider the potential advantages of new water. Better information (eg ecological flow assessments, economic and social impact assessments) is needed to make good decisions in regard to the subregional plan. It was noted that any new water would be going on farm land only and not going into the rivers.

The report included GWS recommendations for OTOP's consideration for the subregional plan, particularly around the new water option and asking that sufficient time be built into the process to identify and fully investigate solutions to the environmental challenges the zone faces.

Adaptive Management Regime

Julia Crossman and Mark Webb presented the proposed adaptive river management regime for the Opihi River, which has been developed by the Adaptive Management Working Group over the last six months, and is based on the experience of the 18 years of the Opuha Dam's operation. The presentation supported the detailed written report provided to the Committee.

The AMWG group believes that the flexibility and adaptability of the proposed regime will provide better environmental, economic, cultural and recreational outcomes for the Opihi catchment than the current regime in the Opihi River Regional Plan (ORRP).

The presenters further explained the two levels of water shortage proposed as part of the adaptive regime – Level 1 Conservative and Level 2 Extreme. A more varied method of determination of a water shortage event is being suggested, using a trigger based on Potential Available Volume (PAV), together with a number of other triggers. An explanation was given of the minimum flows proposed for both levels and proposed irrigation restriction system for Levels 1 and 2.

The group is seeking acceptance of the Adaptive Management Regime for inclusion in the sub regional plan and looks to engage further with the Zone Committee in the solutions phase.

Forest and Bird Society

Forest and Bird Society Field Officer Fraser Ross talked to the Committee about the organisation's projects and concerns and requesting the Healthy Catchment Project widen its scope to broader catchment health rather than focussing on water. Forest and Bird believes there is a biodiversity crisis as a result of intensification in South Canterbury, especially on the plains and OTOP should be involved in preventing any further degradation. The society is concerned at the effect of storage facilities on the environment and the unintended impact these are having eg Levels Plain Irrigation Scheme and resultant problems at Seadown.

Reference was made to the research of Alan Mark of Otago University regarding maximising water yield with indigenous vegetation.

Forest and Bird is seeking the right solution that benefits the environment, biodiversity, recreation and farming. The Society does not want any more water brought into the zone, no more intensification and no further increases in cow numbers.

The meeting concluded at 5pm with a karakia from Peter Ramsden.

Chairperson

ORARI - TEMUKA- OPIHI-PAREORA ZONE WATER MANAGEMENT COMMITTEE
FOR THE MEETING OF 21 AUGUST 2017

Report for Agenda Item No 5

Prepared by Nic Newman
Zone Facilitator, Environment Canterbury

Waitarakao Washdyke Taskforce Report

Purpose of Report

The purpose of the report is to present the Zone Committee with a set of practical actions and future work in the Waitarakao Catchment, for inclusion in the solution package for the Healthy Catchments Project (HCP).

Identification of relevant legislation, Council policy and plans

The priority actions identified by the Taskforce group are not of a statutory nature. However the District Plan, Coastal Plan, and Regional Land and Water Plan could help enable some future actions at the lagoon and regulation could support the achievement of outcomes. It is suggested that planning staff working with the Zone Committee help identify opportunities for the relevant plans to enable future actions.

Funding Implications

The initial actions are being carried out from within existing budgets. However, future Long Term Plan provision may be needed for new projects including: urban/industrial pollution prevention, wetland development, shared cycle/walkway development, and investigating future options for Seadown Drain.

Background

Lagoon:

- Waitarakao Washdyke lagoon has a long history of cultural significance to local rūnanga as an important site for traditional food gathering. Today a Mātaitai reserve covers the area of the greater lagoon and restricts commercial fishing. Areas of particular importance include not only the lagoon itself, but the coastal area adjacent to the lagoon outlet.
- The greater catchment of the lagoon is a key industrial zone and home to regionally significant industry and infrastructure.
- The lagoon and catchment is also home to a variety of wading birds and waterfowl and is an important link in the network of coastal wetlands in Canterbury.
- The two main freshwater inputs to the lagoon are the Seadown Drain and Washdyke Creek. Water quality is influenced by the management of contaminants in the catchment and the management of the drainage infrastructure.
- The lagoon outlet is critical as this is also the stormwater outlet for developed land surrounding the lagoon and an overland flow path outlet for very large Opihi floods.
- A rating district is in place for Seadown Drain. The drain not only removes rainfall and groundwater to enable productive farming, the drain also carries surplus water

during floods, thus benefiting community infrastructure. Water is also drawn from the drain for irrigation.

- Ongoing coastal processes and hydrology changes in the catchment will put increasing pressure on the function of the lagoon over time.

Taskforce:

- The Waitarakao Washdyke Taskforce was formed in July 2016 to achieve improved outcomes for the lagoon across the four well beings.
- Taskforce membership includes: TDC, CRC, DOC, Te Rūnanga O Aroweenua, and OTOP Zone Committee members.
- The Taskforce are focused on short term actions for improved outcomes, along with considering medium and long-term futures for the lagoon.

Key issues

The key issues for the lagoon are:

- Elevated levels of e.coli, nitrates, copper, zinc, and high turbidity
- Compromised food gathering values
- Limited public access
- Imminent changes due to the effects of coastal processes and changing irrigation management on Levels Plain.

Key actions

Short Term (0-2 years)

1. Short term initiatives have focused on improved knowledge, quick win biodiversity projects, education on good management practice for industrial users, and securing public access.
2. Work is also underway to investigate the potential of constructed wetlands between the industrial area and the lagoon. These wetlands could provide a key filtering of pollutants from the lagoon, provide increased habitat, and interface with a potential cycle/walkway around the lagoon.
3. Concurrently, work has been carried to better understand the dynamics of the lagoon, Seadown Drain, and coastal pressures on these over time. This has found that with 400mm of sea level rise predicted in the next 30-50 years, one further (50 m) shift inland of the Seadown Drain is viable. Based on this initial work, further work is needed to look at options for the future of the Seadown Drain and its outlet. This would need to involve those key partners and stakeholders affected.

Medium Term (2-5 years)

4. Dependent on the results of feasibility work, construction of filtering wetlands and a joint cycle way/walkway could be completed. These interventions would provide for improved habitat, improved management of contaminants, and improved recreation values.
5. The feasibility, including funding model, for preferred option(s) for Seadown drain would need to be assessed in this period. Part of this assessment could include a review of the rating of activity in the catchment.

Longer Term (5-50 years)

6. The key intervention will be the implementation of the preferred and approved option for the future management of Seadown Drain and its outlet.

Next steps

The Taskforce will continue to oversee actions during the next period, but also review its ongoing role. Feedback from the Zone Committee and wider community will contribute to this.

Action	Outcome sought	Lead	Other / Support	Status/Comment	Delivery Timing
Delivery of a Pollution Prevention Education Campaign in the catchment	Reduction in pollutants entering the lagoon from the Industrial Area	ECan	TDC	Underway with site visits complete to the first industrial businesses. Learning from these visits will shape the campaign.	Q3 2017 Ongoing
Development of Sustainable Drain Management Guidelines	Reduction in pollutants entering the lagoon from Seadown Drain	ECan	TDC	Scoping stage	Q3 2017
Secure public access over the bridge at Smithfield	Improved public access to the lagoon	TDC	DOC	COMPLETE	Complete
Initiate a water quality monitoring program for the lagoon	Improved understanding of current water quality and input sources to the lagoon	ECan	TDC	Monitoring sites established for monthly monitoring, and auto samplers installed for event sampling. Data collection underway. 8 water level recorders are also now installed. Sediment sampling is planned.	Ongoing
Development of a Wildlife Habitat	Improved biodiversity and habitat	Private	TDC	Consent issued.	2016 - 2020
Enhancement of inanga spawning habitat at a site	Improved biodiversity and habitat	ECan	Private	COMPLETE	Complete

at the Seadown drain cut					
Investigation of the feasibility of wetland development between the industrial area and the lagoon	Improved management of flooding, water quality, habitat, and contaminants	ECan	TDC	Scope of work complete and contract to be let, once funding is confirmed.	Q3 2017
Future thinking about Seadown Drain	Improved management of flooding, water quality, habitat, and contaminants	ECan	TDC / Rating District	Initial investigation work on coastal dynamics complete. Next step is the development of broad options and costs for discussion with key stakeholders/partners	2018/2019
Potential development of a shared walking / biking track	Improved public access to the lagoon	TDC	DOC	Concept under development. Next steps include: discussion with partner organisations /landowners and legal agreements.	2017-2020

Recommendations

1. That the Committee adopts the Taskforce action plan into its draft solutions package.
2. That the Committee seeks feedback on the action plan and future work through community engagement on its solution package.



Otipua Saltwater Creek Working Group Report.

(working draft), for consideration by the OTOP Zone Committee, 21 August 2017.



Contents:

The invited Working Group and its brief.

Catchment description, background information.

Findings –issues explored, information gathered, limitations. Page 12

Recommendations. Page 17

Appendices: One - creek lower reach profiles. Two – urban stormwater catchment..

The Working Group was convened in April 2017 as part of the Healthy Catchments Project by the Orari-Temuka-Opihi-Pareora (OTOP) Zone Committee. Environment Canterbury, Waihao and Arowhenua Rūnanga, Fish and Game Council and three District Councils: Timaru, MacKenzie and Waimate are also represented on the Zone Committee, alongside community and farming. The smaller Working Group has met four times. A previous study (CRC 1994) provided useful background.

Members taking part, as representatives of their organisations:

Christine Moffat or Keith McRobie, Timaru Rowing Club
Bill Weir or Stuart Weir, dairy farmers & irrigators, Fairview Rd, Timaru
Suzanne Eddington, Waihao Rūnanga, Timaru resident
Mark Webb, Fish and Game Council, Temuka
Ashley Harper, Timaru District Council
Chris Coulter, Dept. of Conservation, Geraldine
Graeme Clarke, Environment Canterbury (water quality & ecology)
Adam Martin, Environment Canterbury (hydrology)
Hilary Fraser, Environment Canterbury (river engineering)
Rhys Taylor, Contractor to Environment Canterbury (facilitator)
We also had informal discussion with Ken Linscott, chair of Otipua Wetland Trust and correspondence with Arowhenua Rūnanga contacts.

The initial brief was: **To develop potential solutions to identified issues (attached) for Saltwater Creek/ Otipua, in particular the recreational values associated with rowing and the influence of water quality and quantity on those values,...and actions to address the issues identified.**

Aerial photo below shows some key locations: SH1 bridge and the level recorder just upstream; the Timaru Rowing Club building and launching ramp, the weir and lagoon running north along the shingle bank (and railway line) up to the sea mouth. Timaru landfill and an industrial area is enclosed from the south and east by the rowing reach and the lagoon. Otipua wetland is south west of the rowing reach. Red line is part of the catchment boundary, illustrating the urban stormwater input, which continues Northwards to Gleniti Road. Appendix two maps show the full extent of the urban stormwater catchment.



Catchment Description

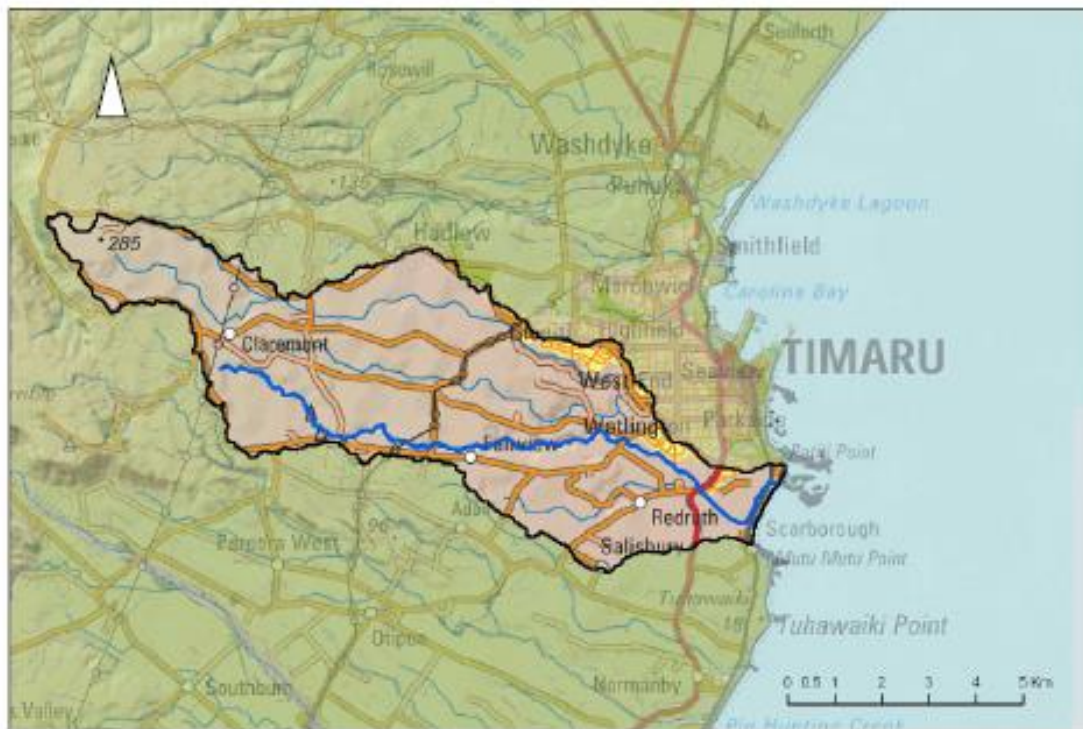
John Benn of Department Of Conservation (2011) describes Otipua/Saltwater Creek catchment area as approximately 48 square kilometres.

Saltwater Creek flows in a mostly east-southeast direction for 15.5 km, from its headwaters in the Claremont downlands, to its mouth, on the southern margin of Timaru city (near Patiti Point). The main tributary channels Otipua Creek North and South Branches, flow for approximately 19 km in a northeast/southwest direction and meets Saltwater Creek approximately 3.7 km upstream from the coast, near the junction of Landsborough Road and Coonoor Road.

The lower reach, below State Highway 1, is highly modified within stop banks, as a larger former lagoon was converted by the local council to a landfill site on the true left bank and wetland restoration including a 4Ha lake on the true right bank (wetland managed by Otipua Wetland Trust, who recently handed the project to the TDC).

The lagoon, with brackish water, sits behind an eroding 3km long shingle ridge and the railway line, and runs back to below the weir (see photo below). The weir dating from 1995 holds back water in summer to 1.5m above mean sea level. It has a small central timber section with fish-passage slots.

Water naturally seeps to the sea through the shingle ridge and when in flood, a mouth opens naturally or earlier with River Engineer assistance, at the northern end of the bank near Patiti Point cliffs.



Above – Saltwater Creek Catchment boundary in black. Otipua North and South Branch are tributaries nearest to Timaru. Below – the brackish lagoon behind the shingle bank and railway line, looking inland.



Geology and Hydrology of the catchment.

The underlying volcanic rock, Basalt, is visible in parts of the upper catchment but mostly overlain by loess clay. This contrast to the river gravels of the plains further north, which were built by the braided rivers' ever-changing courses.

Rainfall is low, dependent on Easterlies for largest inputs and thus vulnerable to droughts in summers with predominant Westerly air flows, such as 2014-2015 and 2015-2016. There are small springs contributing to headwaters but otherwise a clay base and reliance on surface rainwater inputs. Rainstorms can bring rapid flow rises and falls which create bank erosion and transports silt into the low-gradient reach of the former lagoon below SH1, with some volume retained in summer by a 1.5m weir, constructed 22 years ago.



The Environment Canterbury river engineers may open the northern sea mouth with an excavator, when water level at SH1 bridge rises to 1.8m above mean sea level and rain is forecast.



(Photo above shows start of mouth-opening excavations on shingle ridge in early July 2017, looking south. Concrete in foreground is reportedly from the structure of a former shingle processing plant. Below, the outflow begins in excavated channel.)

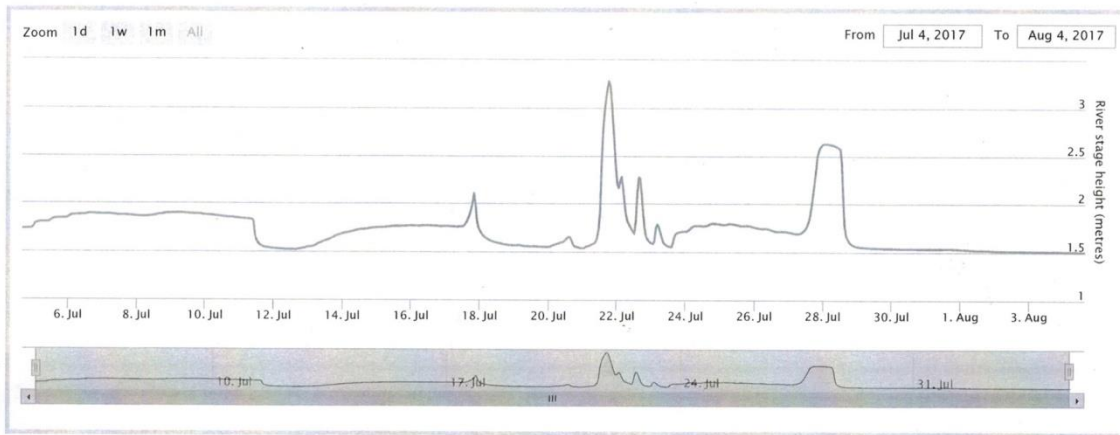


The chart from ECan website below shows Creek water level above mean sea level (by telemetry from just above SH1) during the recent 2017 floods.

River Flow for Saltwater Creek at No.1 SHB

Last sample (NZD std time)	Stage m	Flow m3/s	Change mm/h	7 Day peak stage	7 Day peak flow	7 Day peak date	Temp Celsius
04-Aug 14:05	1.503		0	2.624		28-Jul 02:05	

River stage height (metres)



Information provided by

It shows rapid rises followed by rapid falls once the mouth is open. The weir height is 1.5m, the level at which the post-flood level water SH1 settles after 30 July 2017.

The profile of the lower reach, used for rowing training by Timaru Rowing Club and for informal canoeing and kayaking, shows a V shape in the clay base overlain by accumulating silt. A survey of three transects by boat on 17 June 2017 by group member Mark Webb, produced the profiles in **appendix one**.

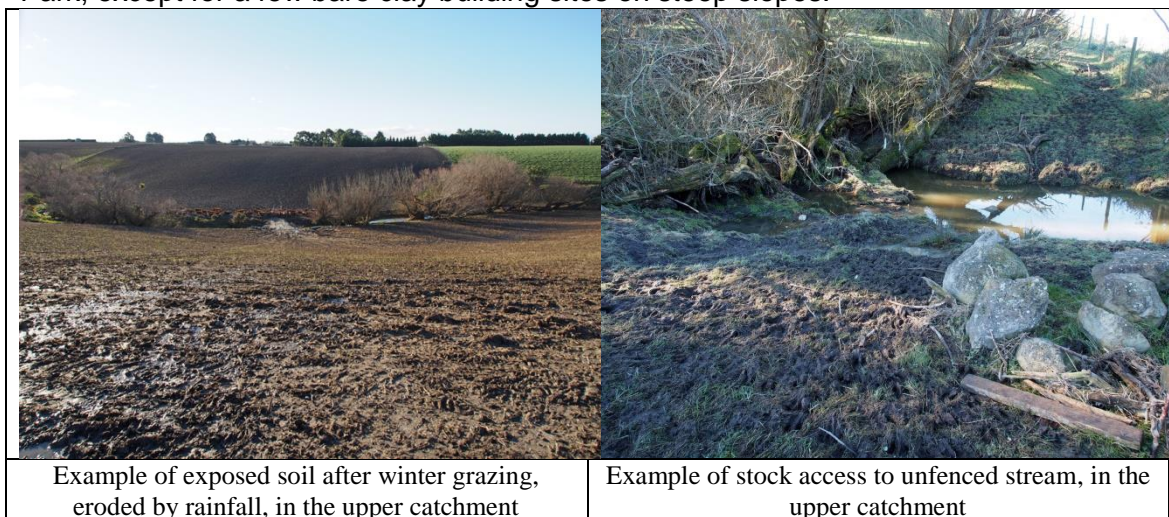
On 5 August, after significant floods had transported silt down the catchment, Mark revisited these transect lines, finding that all three had increased silt depth by 9cm on average, with the greatest depth increase (13cm) in the mid-point and the least close to SH1 (4cm). A calculation from this provides estimated silt transport of over 4,000 cubic metres in the storm event into this 1.2 km reach between SH1 and the weir. This does not include silt washed towards the mouth, over the weir; or that deposited in the 1.8 km of low gradient between Coonor road and SH1.



Steep banks are liable to collapse when wet (photographed before July 2017 flood)

Scoured surfaces at Centennial Park, but native plantings resisted the 2017 flood.

Working Group members observed that bank erosion plus over-land flows and disturbance of accumulated stream and Centennial Lake bed contributed the transported silt. High levels of suspended silt were visible throughout the catchment, many kilometres up its tributaries. The flood coincided with winter grazing of stock and there were areas of exposed soil on some steep slopes above tributaries. Post-flood inspection showed relatively less silt generation from urban areas above Centennial Park, except for a few bare clay building sites on steep slopes.



The March 1986 flood discharge of 120 cubic metres a second, which over-topped stop banks in the lower catchment, was estimated to have a 100 year return period. Climate change, bring more high intensity rainfall events, may well shorten the return frequency.

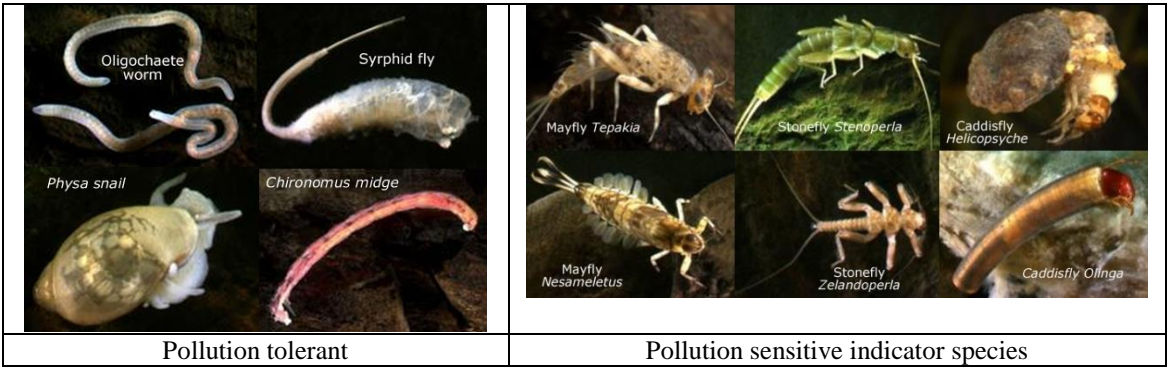
Natural values and water quality

The catchment has been little surveyed for its wildlife characteristics, in part because it has sluggish summer flows meaning that much of the upper reaches can become dry or ponded/disconnected and may experience algae blooms. Low flows and high summer water temperatures mean they are not suitable trout habitat, although they are seen occasionally. At least five introduced species of fish have been present, with one pest fish, rudd, eradicated from Centennial Park Lake in 2009 by CRP poisoning. Others included tench (*Tinca tinca*), and perch (*Perca fluviatilis*); six native fish species – recorded more often in the Otipua South Branch - are long fin eel (*Anguilla dieffenbachii*), the more pollution-tolerant short fin eel (*Anguilla australis schmidtii*), inanga (*Galaxias maculatus*), common bully (*Gobiomorphus cotidianus*), upland bully (*Gobiomorphus breviceps*), and common smelt (or paraki *Retropinna retropinna*). We might expect additional species to live here in cleaner water conditions: lamprey and other galaxiids such as koaro and giant kokopu: so finding them could be an indicator of improving water quality and restored fish passage. See pictures of these fish here: <http://www.doc.govt.nz/nature/native-animals/freshwater-fish/>

At least seven threatened or at risk bird species make use of the lower catchment (Miskelly et al. 2008) These were: white-heron (*Egretta alba modesta*: nationally critical); black-billed gull (*Larus bulleri*: nationally endangered); reef heron (*Egretta sacra sacra*) and red-billed gull (*Larus novaehollandiae scopulinus*), both nationally vulnerable; pied stilt (*Himantopus himantopus leucocephalus*: declining), marsh crake (*Porzana pusilla affinis*: relict) and royal spoonbill, (*Platalea regia*: naturally uncommon). Another eleven more common species have been recorded, including ducks.

Surveys of invertebrates - which are also the fish and duck food - give a good indicator of water habitat quality. Landcare Research, NIWA, Otago University and other bodies

provide field guides which can be used by amateurs as well as professionals. Photo collages below (from Landcare Research) illustrate some of the invertebrate found in different conditions -contrasting pollution tolerant and intolerant species:



Most of the catchment is in farmed or urbanised land, and there are few areas of endemic (non-exotic) vegetation. The gorge on the Otipua South Branch between Brookfield and Barton Road, for example has some surviving native bush remnants thanks to low grazing pressure, and the TDC esplanade walkway and Centennial Park have extensive and well-established native plantings. The Otipua Wetland has at least 45 native wetland and riparian species planted, including kahikatea, which would have been the original dominant podocarp tree a few centuries earlier. Plant species are listed by J Benn (2011 Appendix 3).



Tangata Whenua

Local Rūnanga tell us that the area does not have particular significance, today, for food gathering/mahinga kai in its now-modified state although it would have done historically in its natural wetland state. There may be some family eel fishing, but not commercially. They acknowledge significant recreational values for local residents and have supported the ecological restoration of Otipua Wetland. They wish to see good management practices applied to farmland in the catchment to reduce silt generation and bacteria input.
(more to be added)

Recreational values

Because the catchment is so close to Timaru’s urban population, the Saltwater Creek walkway, on the true left (northern) bank from Centennial Park to the coast, and Otipua

Wetland walkways on and radiating from the lower right stop bank, are well used by walkers and cyclists. It attracts birdwatchers and fishers (for a coarse fishery) and use for rowing and canoeing.

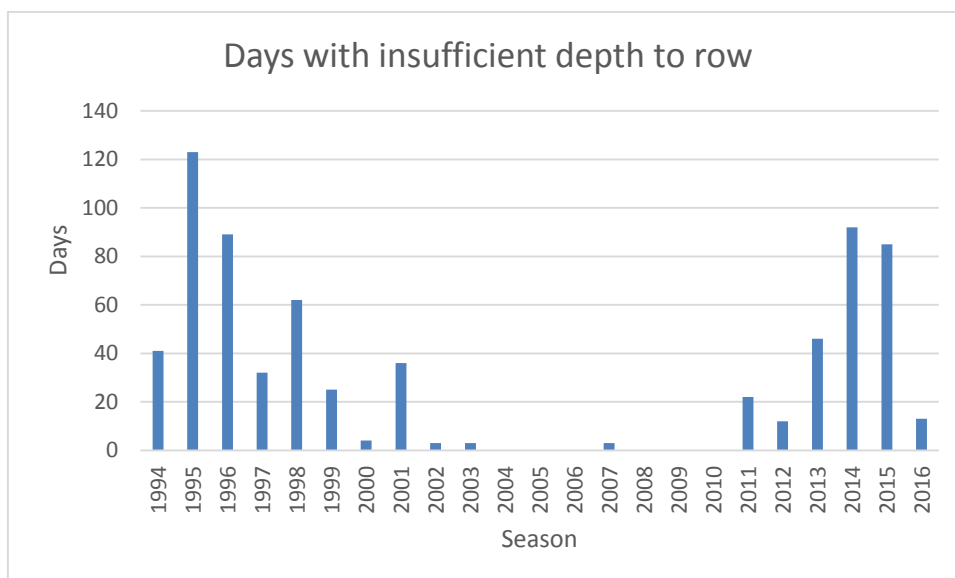
The Timaru Rowing Club has premises on the left bank short walk from highway one (at 53 Rothwell Street) and has expressed dissatisfaction in recent years with the ability of the club to utilise the creek for rowing training. Low summer water levels, algae and a perceived increase in bed sediment depth have been at the forefront of these concerns, potentially increasing the hazards for participants, especially children.



Photo: Prize-winning South Canterbury rowers, February 2016 (photo- John Bisset, Fairfax © Stuff website)

The club have put forward several ideas for consideration which they believe would help extend the rowing season to make forced journeys to their alternative venue, Lake Opuha, less frequent. They have suggested (a) silt excavation and/or (b) raising the weir height, (c) closing the central weir fish passage slots 'to save ponded water', (d) reducing the take of ponded summer water from the lower catchment for other uses, if irrigation proves to be a significant volume of water abstraction relative to rainfall and spring input. The working group have considered all these.

In preparation for the Working Group, analysis was made by Environment Canterbury of rowing season days between end of August to April when water height was below 1.2m, and thus 'insufficient depth to row'. This was most noticeable in the low rainfall summers of 2014 and 2015 seasons, whilst 2016 was wetter and hardly interrupted. (see chart below)



Exploration of issues

1. Water flow balances

The Working Group has attempted to model water flows in the catchment but found insufficient information to do this with confidence. Information which is available includes:

- rainfall measurement representative of the upper catchment (Hadlow), and the catchment area (see chart below for period 2013-2016, blue lines);
- the metered water take for summer irrigation at one farm - Fairview Road, consented until 2025 for 26.5 litres/second maximum flow but typically drawing 18l/sec, and metered since 2011. In summer 2016-2017 the total volume used from December to March was 76,983 cubic metres or 42.15% of the allocation. This compares to 123,026 cubic metres or 67.35% in the previous dry summer, from October to April; (See chart below for several years' water abstraction periods, red lines, on same base time-line as rainfall)
- occasional water input by Timaru District Council from Claremont, which is sourced by pipeline from the Pareora;
- continuous water level (above sea level) data is available at SH1 bridge, but not water level in the lagoon below the weir. Flows and levels are not gauged in the tributaries – it would help to have such data to aid decision-making. The relationship between water level and water flow at the SH1 site is difficult to establish, especially at low flows, because of the broad sluggish nature of the waterway at this point.
- Water outflows via the shingle bank by seepage might be estimated by comparison with calculations used at Wainono lagoon (Hall 2003, page8)

To better understand the impact of consented water abstraction from the Creek for dairy farm irrigation (by pump close to a stream confluence), the water level at the abstraction point has been more accurately related to mean sea level, by reference to the telemetered point at SH1. This will be used to inform farm irrigation decisions in future. The farmers involved have been active participants in the Working Group and share in the wish to improve flows and health of the waterway.

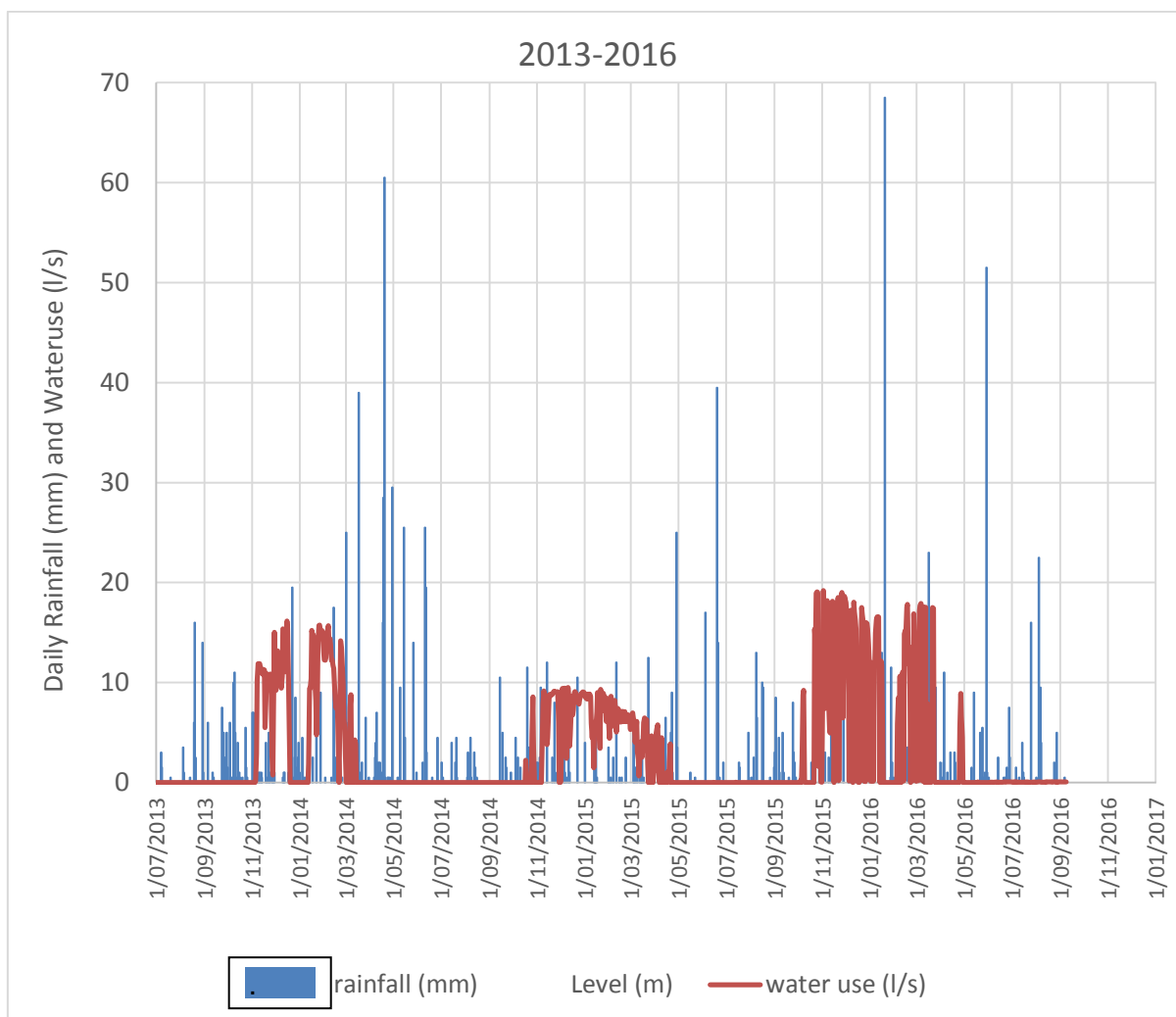


Chart above shows timing relationship of catchment rainfall and water drawn for irrigation. On a shared time line, the daily rainfall scale is in mm (blue) and the rate of water abstracted for irrigation scale in litres/second (red). The catchment's behind-weir storage capacity has not been reliably estimated, but would be useful information. The Rowing Club report that water level falls in summer from 1.5m weir-top to 'too shallow to row' in about 10 days if no rain input, due to losses (including weir fish passage slots, farm abstraction and evaporation).

	
<p>Weir centre boards – contain horizontal fish passage slots. (undated photo)</p>	<p>Overflow point of Centennial Park lake after the July 2017 flood, debris-covered to the top of its protective frame. The Lake also overflowed across a grass swale, as it is designed to do.</p>

2. Silt sources

There has been insufficient time for full stream walks, but some sample sections of tributaries plus all the public walkways have been walked and road bridge access points visited. This has shown that in flood flows the banks are eroding where steep and/or narrow – such as on bends between Quarry Road and Fairview Road. A whole-catchment community group, if formed, might seek permission to walk the entire catchment for a ‘stocktake’ of river condition, to encourage landowner dialogue and adoption of good management practices.

Overland flows from neighbouring farmland further up the catchments are also significant, because of steep slopes (see photos earlier in report). It is likely the loess soil increases the runoff rate in the catchment compared to some other catchments, making overland flow, and high stream velocities during rainfall events more likely to contribute significantly to sediment loss and subsequent deposition further downstream.

Floods will also transport some of the silt that has accumulated over several years in the stream beds and in Centennial Park Lake, where slow water speeds had allowed settlement. The Working Group sees opportunity for local landowner education and advice outreach on silt loss mitigation to suit the soil and climate. Forming a Catchment Group may assist by allowing peer-influence to spread good practice, in preference to imposing external regulation by rules, although gross pollution incidents and consent breaches will still require interventions.

3. Silt removal

The Timaru Rowing Club can row only down to water levels of 1.2metres above mean sea level (at 2016) and propose that Environment Canterbury build a removable or remotely-controlled central section of the weir, a few metres wide, to be opened prior to Spring rain to help flush silt from the rowing reach into the lower lagoon. This case is not yet convincing. The recent flood demonstrated that silt depth increases after a flood, with some deposition behind the weir and the greatest depth increase is not seen at the weir itself (Webb, pers com). The low gradient from SH1 downstream means that silt drops along the whole kilometre of rowing reach. The benefits of installing this sort of structure on silt depth are likely to be limited to a small area close to the weir.

An alternative discussed, but very expensive for the Rowing Club, is silt excavation along their entire rowing reach. This would have to be achieved by long-arm excavator reaching towards the centre from the true right stop bank and implies wet silt be deposited into the adjacent Otipua Wetland edge, for dewatering, either leaving it there or removing it once dry? If attempted, this would need to be a cold dry-weather task to mitigate environmental and amenity risks and be subject to control by Timaru District Council (as landowner) and Environment Canterbury (for consent to work in the waterway). Significant disturbance and resuspension of bed sediment during the summer months increases the risk of algal blooms and macrophyte growth. Furthermore, prolonged periods of high organic loads and associated deoxygenation (especially in summer warmth) and high turbidity during this work may impact upon fish and other organisms living in this reach, and further downstream. An assessment of these potential effects would need to be carried out prior to granting of a consent.

An assessment of bed sediment contamination has been carried out for this Working Group (lab analysis on file), and although some heavy metal and persistent organo-chloride pesticide contamination is evident, it is likely to meet TDC landfill acceptance criteria once dried, but expensive to tip there.

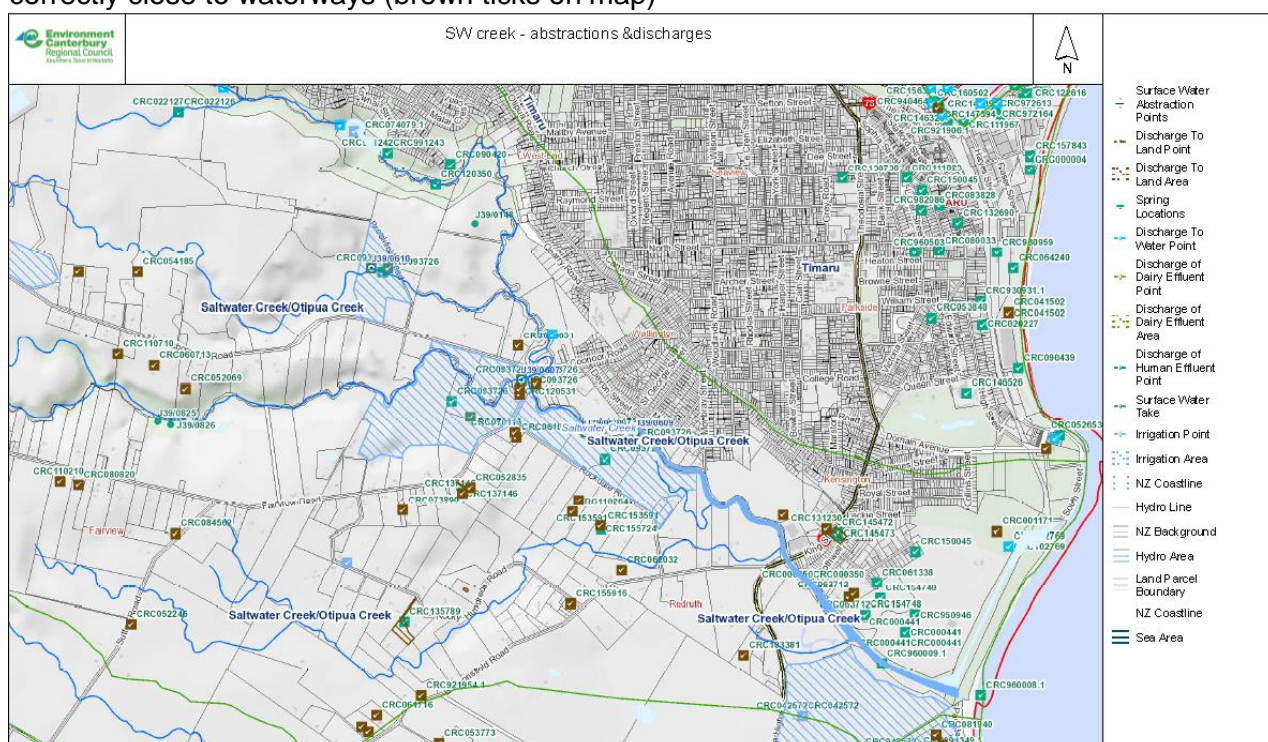
4. Water quality monitoring & pollution sources.

Water quality is monitored by Environment Canterbury towards the lower reaches of the catchment, at SH1. Water quality has been raised as an issue by the Rowing Club, by tangata whenua and recreational users, as the Creek has sediment, low dissolved oxygen (especially on hot days), high phosphorus and summer ammonia concentrations. Regular nuisance macrophyte growths feature during the summer months – most notably the free-floating fern *Azolla* (shown in photo below). There have also been infrequent blooms of the phytoplankton *Anabaena* sp. *Azolla* and *Anabaena* have a symbiotic relationship, whereby *Anabaena* fixes atmospheric nitrogen, and *Azolla* provides suitable habitat for *Anabaena* to grow.

E.coli bacteria measurements have been high in the past after rain, reflecting likely impacts from pastoral farmland and urban stormwater inputs.



The Environment Canterbury databases list and map areas of on-farm irrigation for both arable and dairying (blue diagonal hatching on map below), which may increase Nitrogen losses (N) and potentially create over-land flows of silt, carrying phosphorus (P). Combined with topography, this identifies potential hot spots of nutrient losses to water which landowners will attempt to tackle, using Farm Environment Plans where required, and can be regulated in part via consent conditions. Similar regulation applies to storage and application of dairy shed effluent to paddocks (discharges to land. Green ticks on map – often coincide with irrigated land areas) and to urban stormwater piped discharges to water (blue ticks on map). Domestic septic tanks and disposal fields are also a potential pollution source, if overflowing or not operated correctly close to waterways (brown ticks on map)



Other potential sources of water pollution include historic residues in accumulated sediment from industry that discharged to water in days before regulation, such as Timaru Chargeurs wool scour; and the metals that appear in urban stormwater (Watters, 2016): such as zinc from galvanised roofs and copper from wear of vehicle brake pads, detergents from on-road car washing; bacteria from waterfowl and gull droppings. Others can be hydrocarbons leached from car breaker's yards and potentially carcinogenic agricultural chemical persistent residues – for example Dieldrin and DDT/DDE (Stewart, et al 2010). Urban stormwater and landfill leachates can contain other 'emerging' organic contaminants, not regularly tested for (Zgheib et al., 2011).

Water quality monitoring sites are limited around Timaru – there are several in the Washdyke/Seadown Drain catchment but only one currently on Saltwater Creek (ref SQ2040 at SH1 Bridge), one historically upstream at Coonoors Road (SQ20404) and one in the lagoon below the weir. These sites were discontinued by Environment Canterbury scientists "to allow for an increase in sampling frequency at the SH1 site, allowing for a better understanding of current water quality state, and faster detection of trends over time."



At the Saltwater Creek SH1 current water quality monitoring location, dissolved reactive phosphorus (P) levels are high with mean of 0.2 mg/litre, potentially due to the Basalt bedrock which is a natural producer, especially in stagnant, low-oxygen or anaerobic conditions in summer. The same anoxic water conditions tend to produce ammonia from reduction of nitrogen oxides. Ammonia nitrogen concentrations did not exceed the National Water Policy Statement For Freshwater Management 'bottom line' between 2012-2016. (Hayward et al 2016). These nutrient concentrations favour algal blooms, but are not directly toxic to aquatic life.

Total suspended solids (including the silt) are however in the range that affects ecosystem health, with a mean of 5 mg/litre and range 1 to over 50 across the samples taken in five years. (Hayward 2016) Sediment is accumulating on the Creek bed and observations indicate the Canterbury Land and Water Regional Plan objective for annual maximum cover of deposited sediment was exceeded in 2013-2014.

The 95th percentile concentration for E. coli, in Saltwater Creek on year-round data is just below the guideline for primary contact recreation (e.g. swimming). However median concentrations fell well below the NPS national bottom line for recreational activities involving occasional immersion (such as rowing), and were within the 'attribute state A'. This indicates that there is likely a lower public health risk for infection for activities involving occasional immersion at these sites, such as rowing. Anecdotal reports from the Rowing Club indicate that bacterial infections associated with Creek water contact are rare (Moffat, pers com).

Recommendations

Recommendation 1)) Form an Otipua- Saltwater Creek Catchment Group.

Noting that the catchment and its tributaries are experiencing bank erosion and local pollution 'hot spots' generating silt, a combined urban and rural Catchment Group would help focus public attention and encourage good management practices. This may have a long-term impact on reducing silt, bacteria and other pollutants washed into the lower reaches and thus improve water quality. Consent enforcement and pollution responses by Environment Canterbury, District Council education about protecting urban stormwater and the promotion of Farm Environment Plans would continue alongside such a voluntary group.

Recommendation 2)) Investigate stream health immediately as a information baseline.

In support of Catchment Group formation, we recommend that professional invertebrate surveys and water quality sampling be conducted in Spring 2017 on the three main tributaries of Otipua-Saltwater Creek to provide baseline information which will inform discussion at its first public sessions. It may be possible to continue invertebrate and water quality sampling by volunteers in a catchment group and we also recommend (2b) **professional water quality and habitat monitoring by Environment Canterbury be undertaken annually, to look for long-term improvements.**

Recommendation 3)) Councils begin formal process to establish a River Rating District for this catchment.

To identify resources for care of the catchment and for River Engineering/flood control, culvert quality and willow management, a River Rate would secure modest financial contributions from all landowners adjacent to and feeding the catchment, including part of urban Timaru. (for this see maps in appendix two)

Recommendation 4)

a) Technical support for the Rowing Club to investigate silt excavation from the lower river reach, below SH1 and above the weir, to increase depth available for rowing.

We have conducted a survey to compare silt depth on three cross-sections of the River with data from 20 years ago, showing a broadly similar depth of silt lying on the clay base prior to 2017 floods and increased silt depth after these floods; although it was noted that there has been some previous excavation of unknown quantity during those 20 years. To increase the annual use period of the rowing reach by Timaru rowing club, we recommend some excavation of silt, informed by our laboratory analysis (appended) showing that de-watered silt would meet criteria for landfill acceptability, but not capping. Consent requests addressing potential environmental effects from the proposed works on in-stream water quality and ecology, and odour, would need to be submitted to Environment Canterbury and the Timaru District Council.

It is further recommended:

- b) that The Timaru Rowing Club organise and fund a small silt excavation, close to their boat launching area, subject to necessary consents.**
- c) that any redesign and future operating protocol for the Weir attempts to flush some of the accumulating silt by opening the weir in anticipation of high rainfall events and closing it after floods (unless effect on silt would be too local and small scale).**

Recommendation 5)

a) A feasibility study and costing be made by Environment Canterbury of raising weir height from the current 1.5m to at least 1.6m, or perhaps higher, if it would create a deeper pool for rowing behind the Weir in summer.

This is subject to expert assessment of expected impact on flood risk to surrounding areas, effects on the plantings in the wetland, and to satisfactory provision of fish passage for the native species found in these waters. It is noted that on current protocols the northern mouth of Saltwater Creek can be opened by River Engineers once water level at Highway One exceeds 1.8 m and rain is forecast. There is already informal liaison between the Rowing Club and the Engineers about mouth openings during the peak rowing months of October, November and March –

(b) we recommend that this liaison continue.

Recommendation 6)) any modification to the weir should include a structure that provides for seasonal fish passage, and a degree of water connectivity between the upper and lower reaches.

Fish passage is not required here for trout or salmon (from Fish & Game Council's knowledge) but for native fish species, reliable access up and down stream is only available during the 60% of the year that water level is above 1.5 m, and thus flowing over the Weir. We are unsure if existing fish passage slots within the weir function successfully, particularly for upstream travel. Engineer designs for any proposed Weir upgrade should be assessed for their ecological impact, including potential effect on water quality (including aesthetic impacts) , plant growth, dewatering of the lower reaches, fish passage, and:

Recommendation 7)a) during summer 2017- 2018, water level be monitored downstream of the weir, frequently and preferably continuously, to allow comparison with available above weir heights (= SH1 water level telemetry). Further, (7b) it is recommended a piece of work is carried out to better estimate flow through the current centre-weir slots at a range of upstream and downstream water levels.

This will identify availability of fish passage that occurs when water levels on either side of the weir are the same, when fish can migrate through the timber fish pass slots provided. This will also assist with water flow and modelling monitoring of the catchment. Insufficient data on water flows into and out of the catchment have made accurate modelling impossible, but a comparison of estimated rainfall catchment run-off and water abstraction for irrigation, plus weir losses, shows that summer irrigation and rowing depth probably relies on ponding behind the weir rather than natural daily inflows to provide sufficient volume.

Recommendation 8)) Temporary flow gauging be installed on at least three tributaries during summer 2017- 2018 to help determine the size of catchment inflows.

This is an important step in assessing the effect of already-metered irrigation abstraction.



Recommendation 9)) A joint Environment Canterbury and NZ Rail study be undertaken of local coastal erosion processes, to consider scope for any remedial/protection action, or otherwise to plan for a managed coastline retreat and to consider its impact on this waterway.

We are concerned to note rapid coastal erosion at the northern mouth of Saltwater Creek, as has been noted also at Washdyke Lagoon (it might be a study relating to both sections of coast?). This may be influenced by reduced amounts of longshore drift

shingle travelling northwards since the construction dams on the Waitaki River, and in the longer term by global sea level rise.

Recommendation 10)) Environment Canterbury Land Management Advisors, Consent Monitoring Officers and a future Catchment Group encourage greater use of fenced ‘buffer strips’ along tributary waterways, especially below slopes, to intercept silt; and other aspects of farm good management practice.

If water supply for stock is essential from the surface flow, in the current absence of reticulated stock water in certain paddocks, drinking access points should be fenced to restrict stock from standing in the water and surfaced to minimise pugging or erosion. Seeking good management practice - Examples of fenced and thus ungrazed riparian buffer strips in the photos below:

	
<p>Riparian fenced strips (example from the Ohapi). Some farmers now advocate for wider strips than these, and for native tree planting on one bank, preferably Northern, to shade the water.</p>	<p>Permanently fenced riparian strip on true right of Saltwater Creek, 2017. Many banks of Saltwater Creek tributaries are grazed to the water’s edge, with just single temporary hot-wire fencing on the bank.</p>

Final word

The Working Group recognises that the OTOP Zone Committee will be making Zone-wide proposals which may take up some of the above recommendations, whilst others will be accepted as catchment-specific. Some will be best pursued within immediate and Long-Term Plan work programmes of local government, others require concerted inter-agency actions to make progress. The Group thanks Environment Canterbury for facilitating the process and engaging cooperation of many stakeholders. Further landowners and residents may wish to become involved – the proposed Catchment Group provides a mechanism.

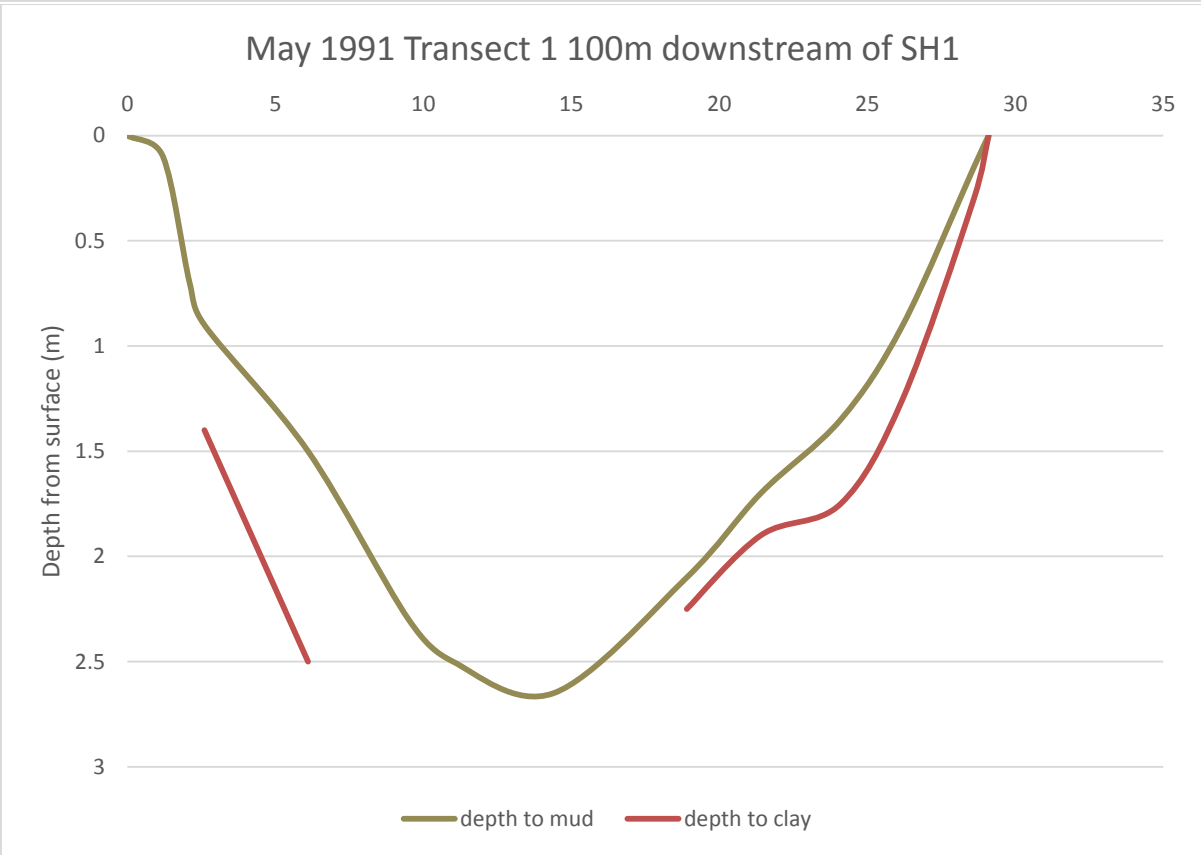
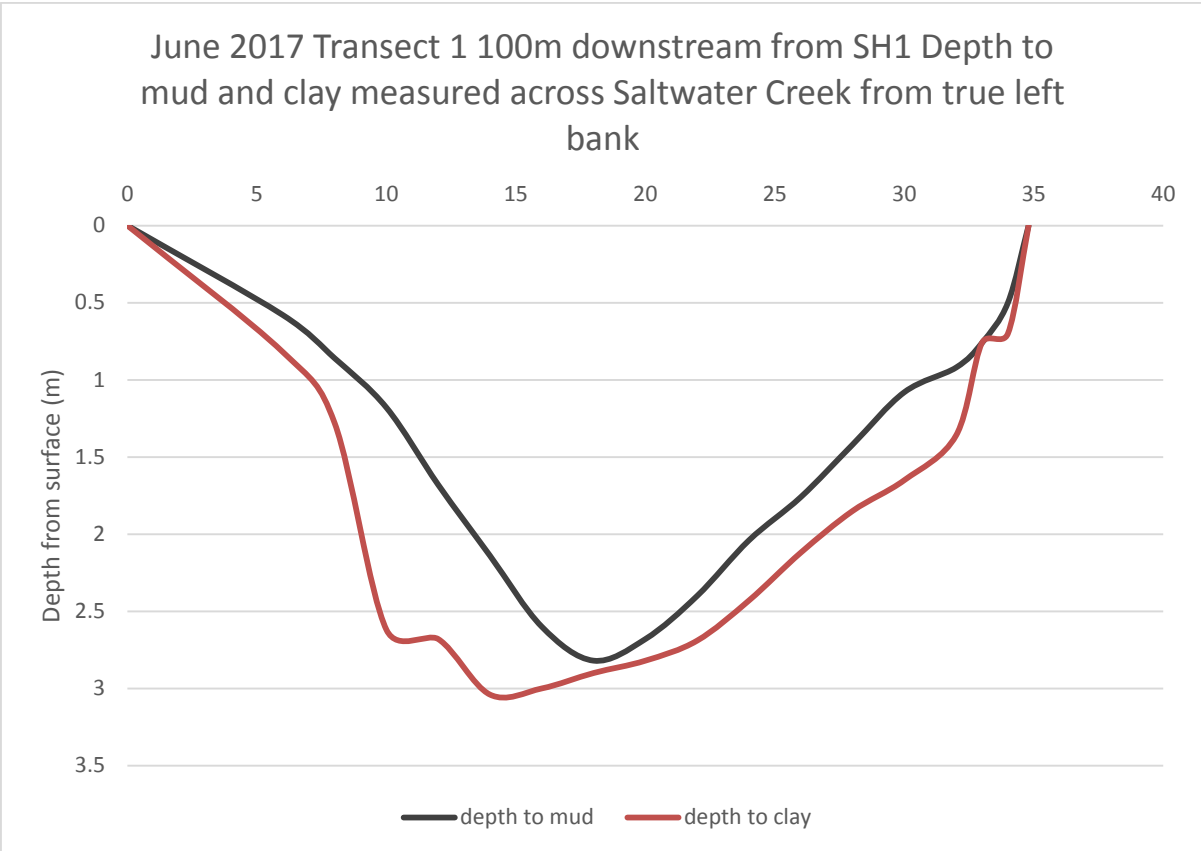
Enquiries and suggestions prompted by this Draft Report may be made to Mike Hide at Environment Canterbury, Church Street, Timaru Office. Michael.Hide@ecan.govt.nz

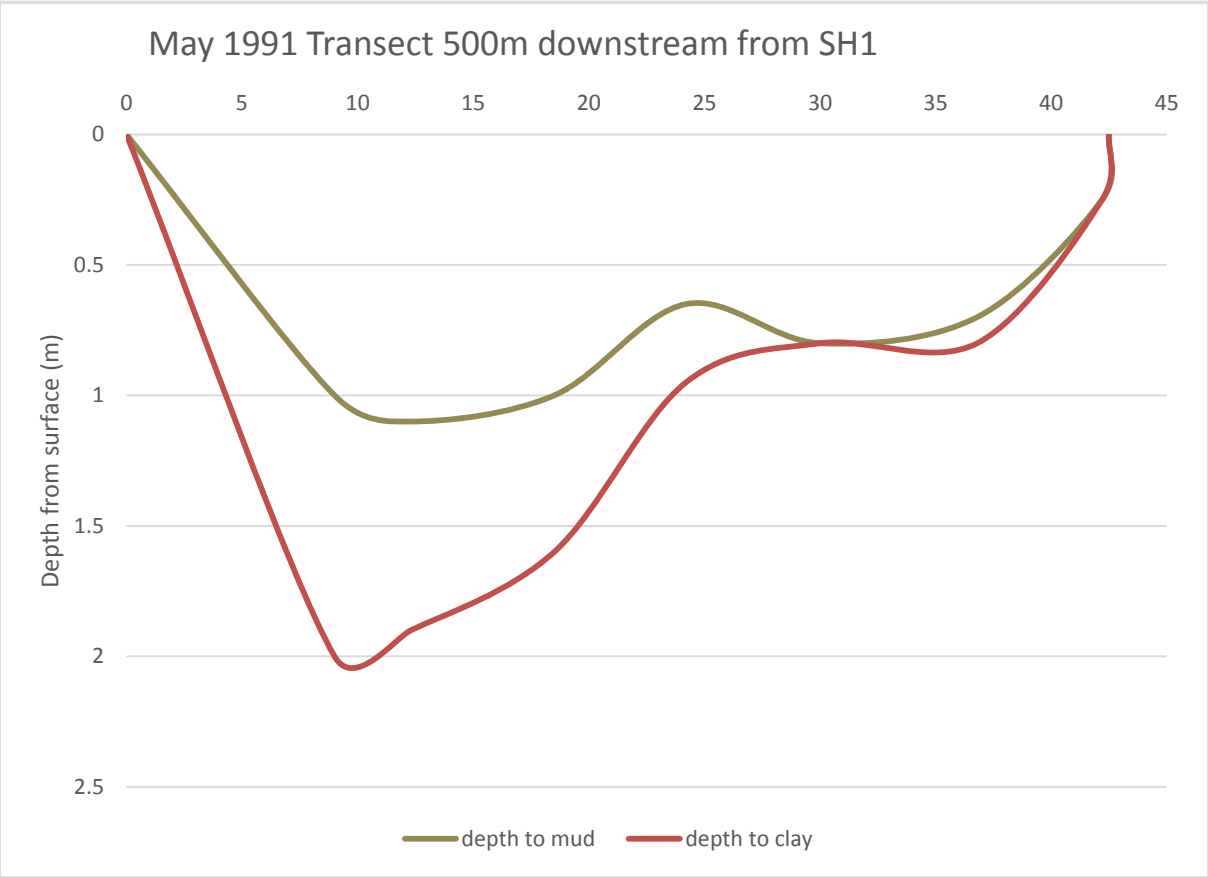
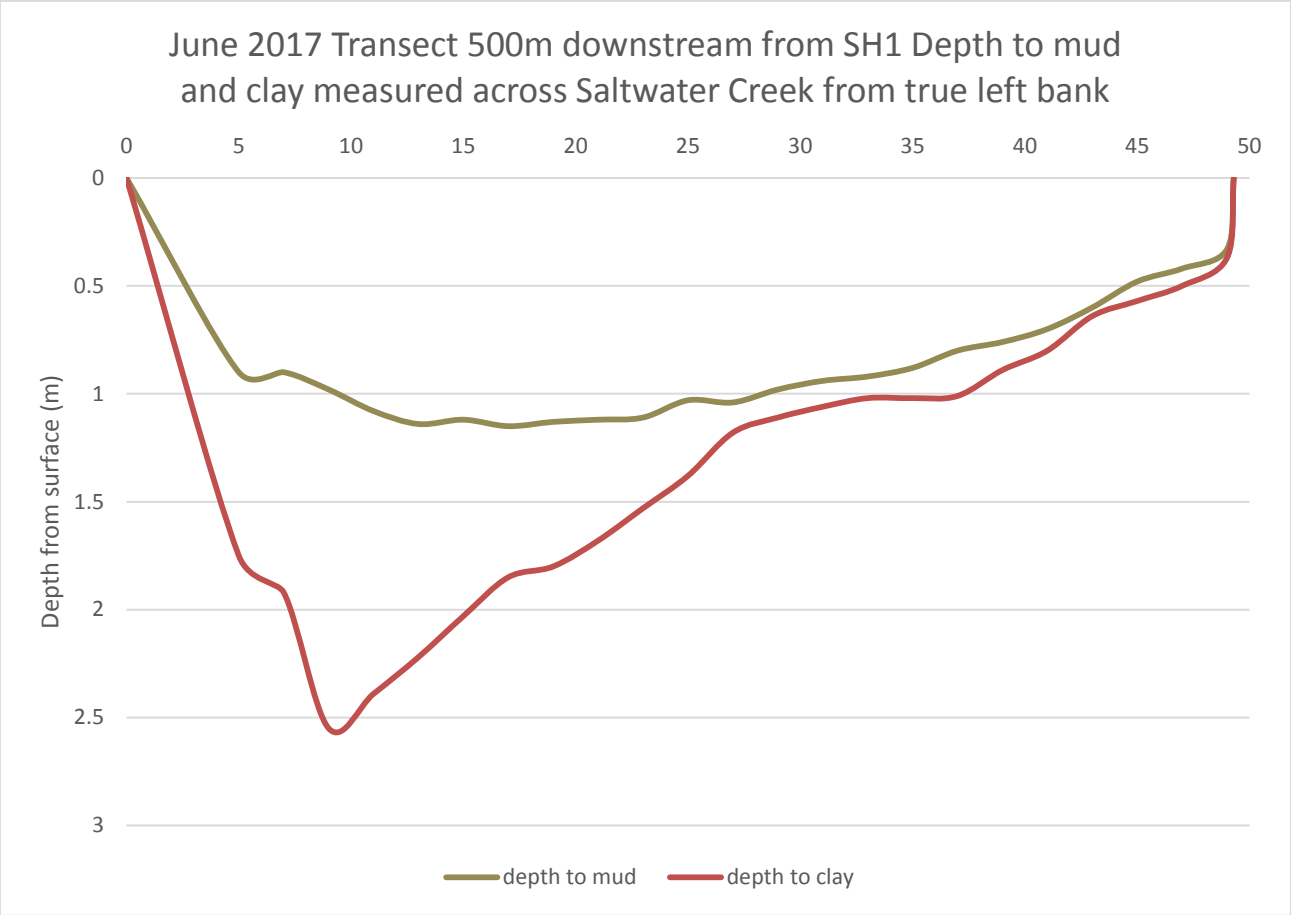
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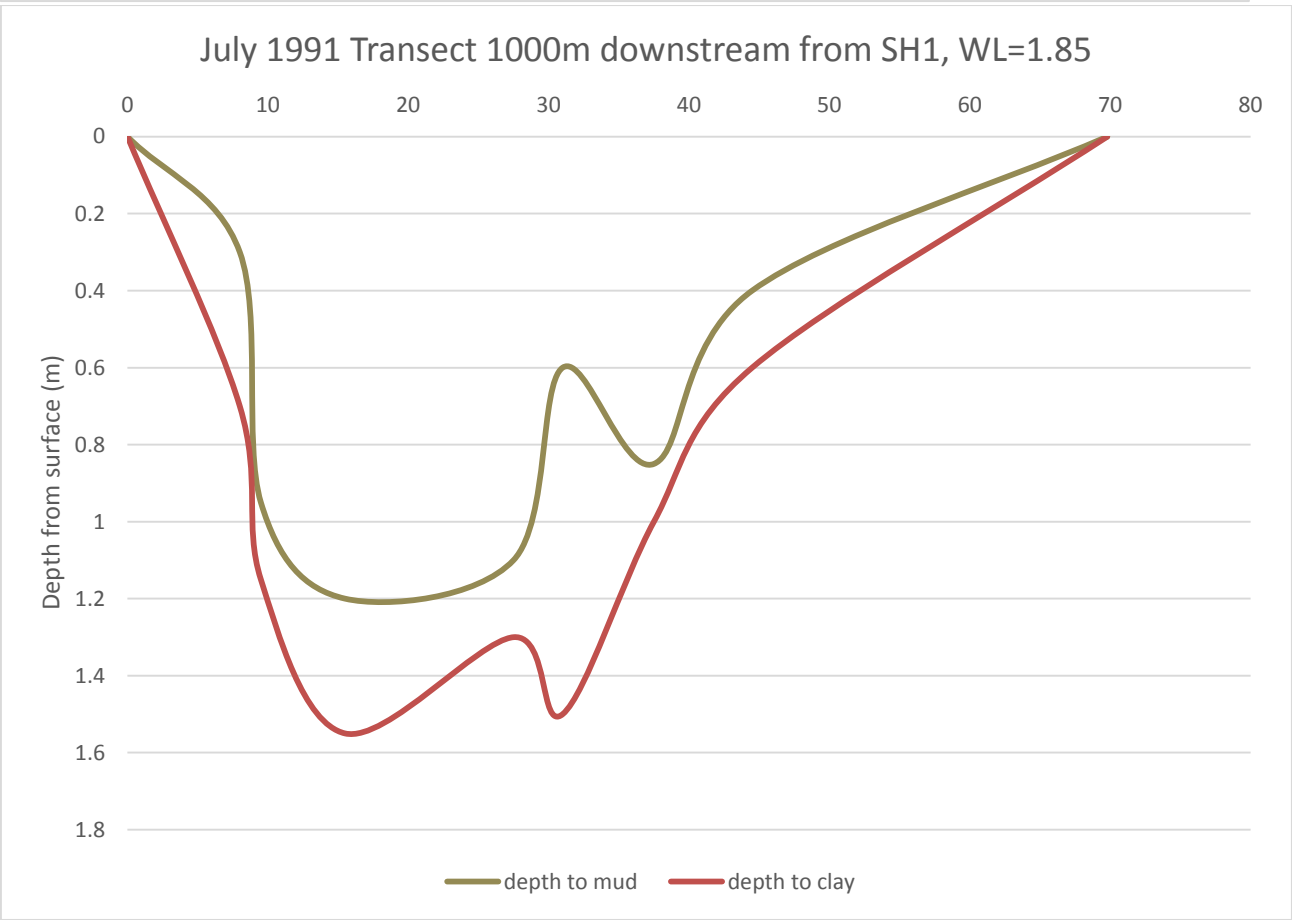
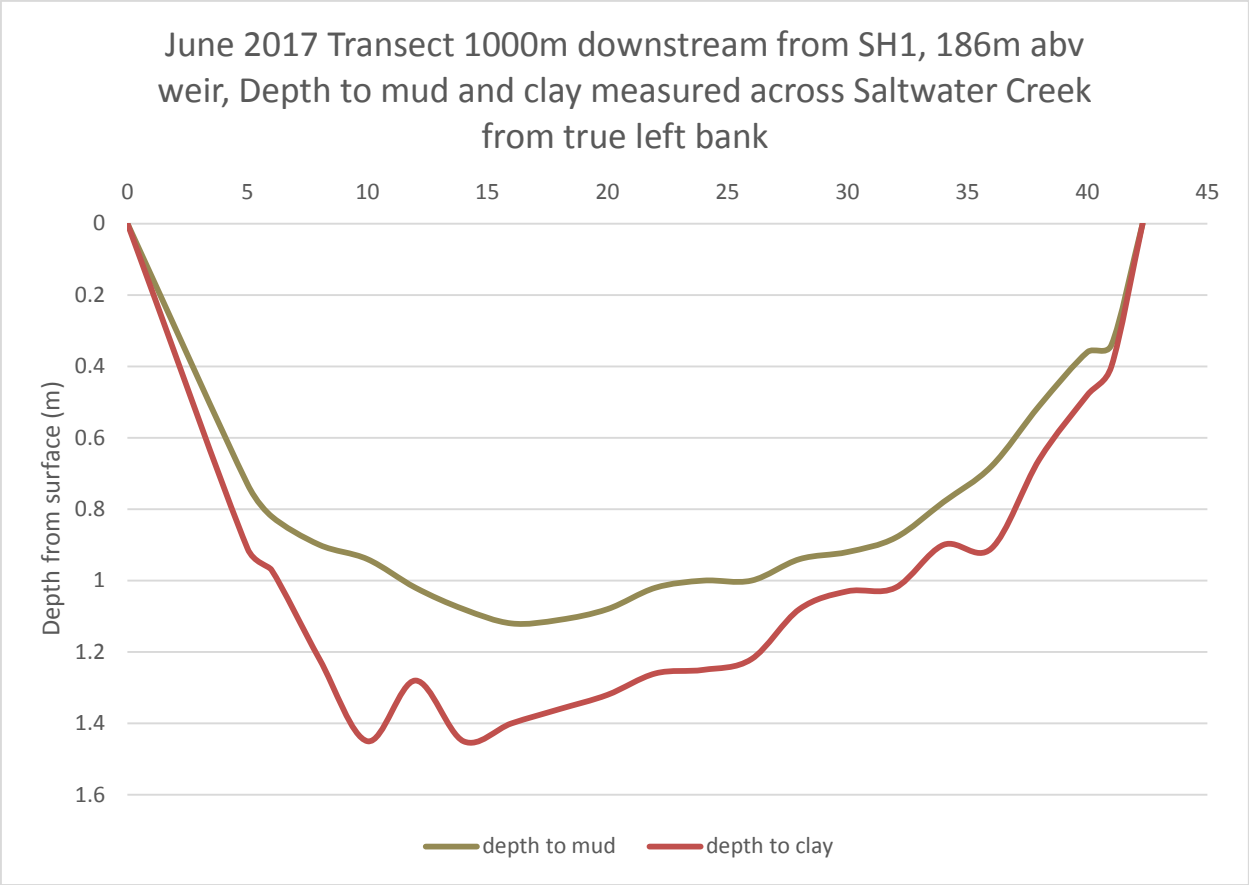
- Canterbury Regional Council. 1994. Issues and Options for the management of land and water resources in the Saltwater (Otipua) Creek Catchment. Report R94 (22)
- Canterbury Regional Council. 2017. Healthy Catchments Project, OTOP Zone. <https://apps.canterburymaps.govt.nz/OTOP/otop.html>
- Department of Conservation. *Fish-passage-management*. Webpage: <http://www.doc.govt.nz/nature/habitats/freshwater/fish-passage-management/>
- Hayward S, Clarke G, Dynes K, Barnden A, Arthur J and Barbour S. 2016. Orari, Temuka Opihi and Pareora Zone: state and trends in water quality and aquatic ecology. Environment Canterbury Report R16/63
- Hall R J. 2003. Hydrological implications of a lake level control weir for Wainono Lagoon, South Canterbury. Dept of Conservation: Science Internal Series 127, Wellington.
- Stewart M, Hickey C, Phillips N and Olsen G. 2010 Contaminants in Kai – Arowhenua rohe. Part 2 Risk Assessment. NIWA client report. Hamilton.
- Zgheib S, Moilleron R, Saad M, and Chebbo G. 2011. Partition of pollution between dissolved and particulate phases: What about emerging substances in urban stormwater catchments? In Water Res. 45, 913-925. (*cited in* An Update on Emerging Organic Contaminants of Concern for New Zealand with Guidance on Monitoring Approaches for Councils. 2016. Auckland Council Tech Report 2016/006)
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Appendix one: three profiles of Saltwater Creek rowing reach, measured voluntarily by Mark Webb, as a Working Group member (in July 2017 before recent floods), compared to historic profiles from 1991.



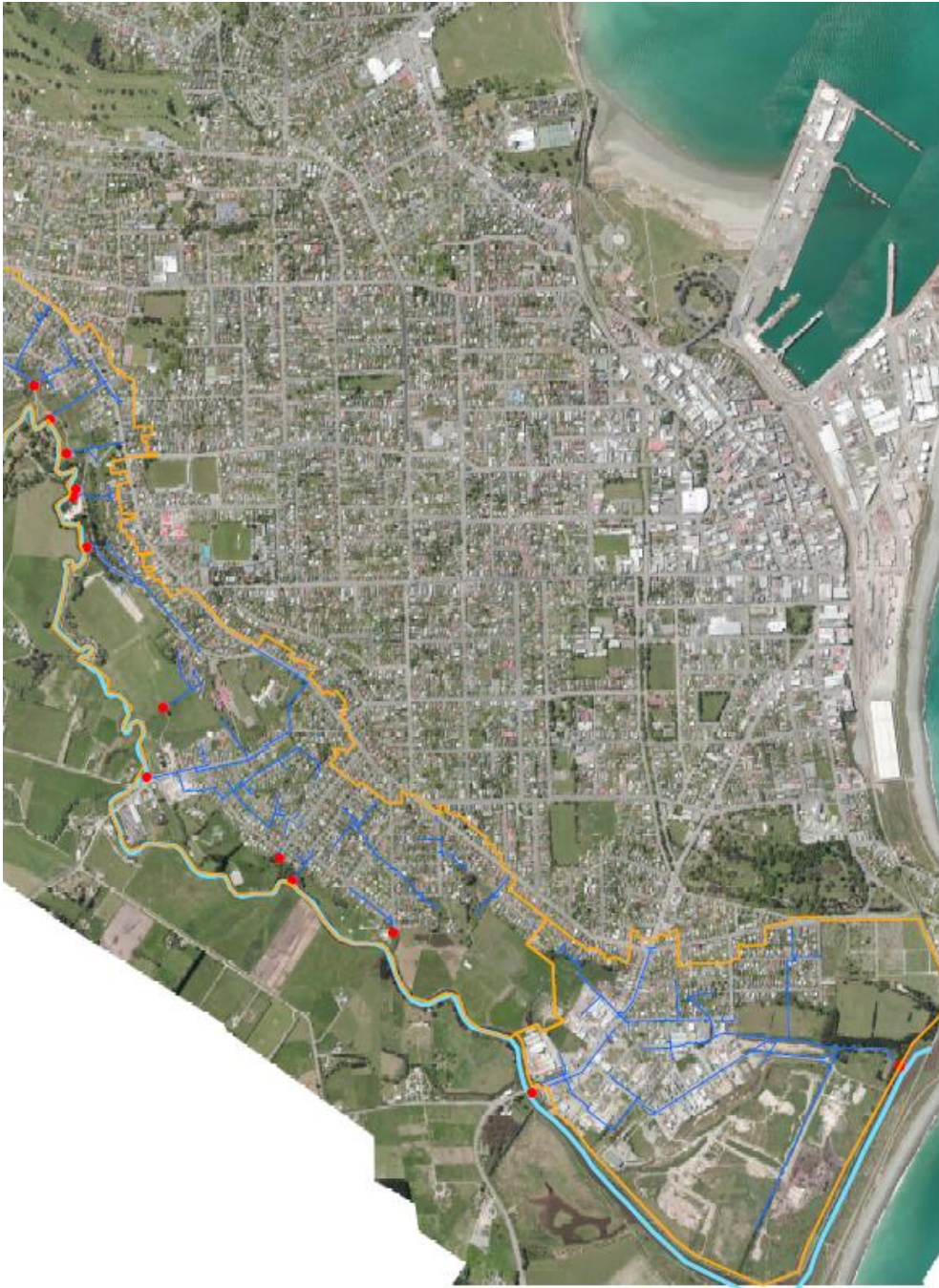






Appendix 2. Urban catchment – stormwater contributions to Upper Otipua/Saltwater Creek.





ORARI-TEMUKA-OPIHI-PAREORA ZONE WATER MANAGEMENT COMMITTEE
FOR THE MEETING OF 21 AUGUST 2017

Report for Agenda Item No 7

Prepared by Alexia Foster-Bohm

OTOP Community Engagement Plan During the Solutions Phase

Purpose of Report

To outline:

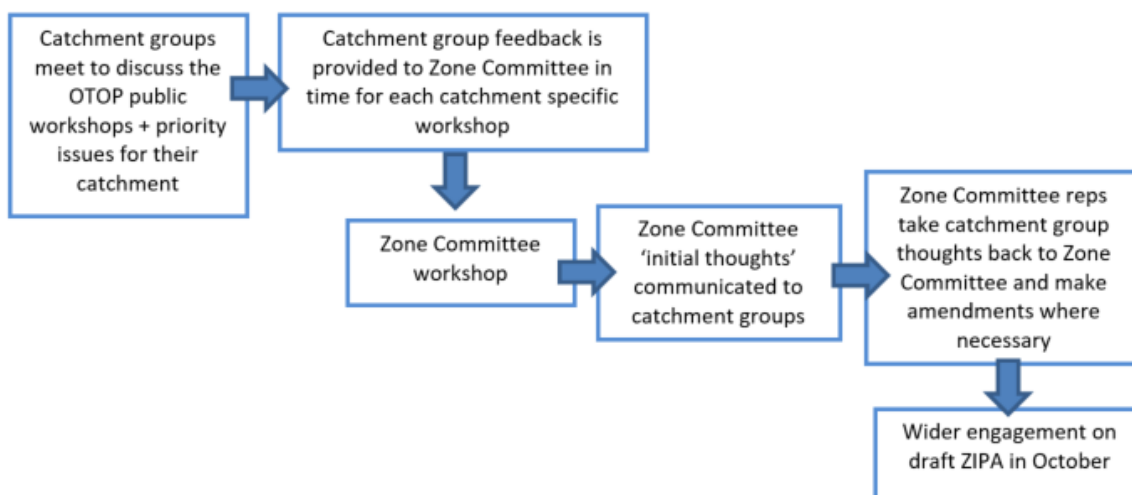
- 1) The progress of the Zone Committee and who has been involved
- 2) The key milestones for OTO community engagement through till December.

Background

1) What phase is the zone committee in now?

Since July the Zone Committee have been meeting regularly to pull together technical information about issues specific to each catchment.

In addition to this the following targeted engagement approach has been used to give catchment groups the opportunity to present their views and recommendations to the Zone Committee.



So far the Zone Committee has heard from all of the catchment groups and has been back in touch with the Orari catchment group. At this meeting Mark Webb and Hamish McFarlane (zone committee representatives) worked t'hrough each recommendation one-by-one to cross-check the zone committees initial thinking with the recommendations made by the catchment group. This enabled the catchment group to have some good informal discussions with the zone committee members. As per Appendix 1. – all catchment groups will be given this opportunity.

2) What's Coming Up?

Minimum Flow and Allocation in the Opihi and Temuka Catchments

There are a number of considerations for minimum flows and allocations in the Opihi and Temuka Catchments, including:

- How environmental and irrigation flows from Opuha dam will be managed, particularly in dry years for shareholders of Opuha Water Limited.
- Minimum flows and allocations within the Opihi catchment, including on tributaries for shareholders and non-shareholders of Opuha Water Limited.
- Minimum flows and allocations for consent holders in the Temuka Catchment.

The Zone Committee recognises that decisions on these aspects will impact Opuha Water Limited, shareholders (affiliated consent holders), other consent holders in the Opihi (non affiliated consent holders, and consent holders in the Temuka catchment), as well as other parties interested in the health of the river.

For shareholders of Opuha Water Limited, recommendations have been made to the Zone Committee from Opuha Water Limited and the Adaptive Management Working Group (AMWG). The AMWG have also sought technical and planning advice from ECan staff on the recommendations made to the Zone Committee to date.

Opuha Water Limited will be coming back to present to the Zone Committee in September with their recommendations for minimum flows and allocation for shareholders in the Opihi and Temuka Catchments. In addition, the Zone Committee also wish to engage with consent holders in the Opihi/Temuka catchments who may be affected by any changes to minimum flows requirements. The committee seek to engage with affected parties after they have further deliberated on technical work prepared for the Opihi and Temuka catchments.

Wider Public Engagement on the Draft Solutions Package

The Zone Committee has signalled that they will bring a 'solutions package' to the community in October.

Some possible options for the Zone Committee to consider include: -

Option 1: Public Workshops

The Zone Committee present their draft recommendations to all interested parties in Fairlie, Geraldine and Timaru.

Option 2: Drop in Sessions

The Zone Committee spend a couple of days at a venue (in Timaru) whereby NGO's and industry groups are invited to present their views in a pre-booked slot.

Option 3: Drop in displays/ open days

The Zone Committee invite all community members the opportunity to see wall displays and provide feedback at work stations – venues to be based in each catchment.

Recommendation:

A combination of all options where there would be:

- 1) Public workshops in the first half of the engagement period
- 2) Drop in sessions and drop in displays/ open days in the second half of the engagement period.

This would enable the Zone Committee to firstly present their recommendations to the wider public and then give the community members different options for how they wish to provide feedback over an extended period of time.

Appendix 1. Key Milestones for OTOP Community Engagement Until December

Timeframe	Milestone
15 th – 30 th August	Zone committee representatives engage with Pareora catchment group on their initial thinking
Mid September	Zone Committee representatives engage with Opihi/Temuka catchment groups Meetings: - 1) Upper Opihi meeting: Opuha/Upper Opihi, Te Ana a Wai catchment groups 2) Lower Opihi meeting: Waihi/ Temuka, Kakahu, Lower Opihi catchment groups
September	Zone Committee engages with Arowhenua on draft recommendations in the Opihi/Temuka catchments.
September - October	The Zone Committee provide an update to consent holders with minimum flow considerations in the Opihi/Temuka catchments on where deliberations have got to.
October – start of November	Community Engagement on the Draft ZIP Addendum