

LOWER OPIHI CATCHMENT GROUP (LOGG)

PRESENTATION TO

OTOP ZONE WATER MANAGEMENT COMMITTEE

7TH August 2017

Executive Summary:

Issue	Impact/Issues	Recommendations supported by the LOGG
Water Quantity	<p>The Opihi River system is unique coastal river system in NZ as a modified in main stream storage, which allows management of river flows to enhance; river health, recreational cultural and commercial use of water.</p> <p>The barometer of our river health is reflected by the status of the Opihi Lagoon</p>	<p>As Opuha Water is fully allocated and as there is no “new water” available. All new water consents to be notified.</p> <p>That the Adaptive Management Working Group (AMWG) proposal be adopted to enable flexibility of variable flows to enhance river health.</p> <p>A robustness and transparency in the issuing of consents</p>
Water Quality	<p>Drinking and stock water takes are abstracted from the Opihi (largest take is Sale Yards bridge (329 l/sec))</p> <p>The river is used by many people in our community. Commercial use, (irrigators, industrial, TDC takes, domestic,) fishers, boaters, Mahinga Kia gathering, swimmers, 4 Wheel Drivers, walkers, bird watchers, campers....</p>	<p>That land users adopt Good Management Practices GMP</p> <p>That we support the implement of Farm Environment Plans</p> <p>That we applaud the upgrading of sewerage from Geraldine, Temuka and Pleasant Point to the TDC treatment plant.</p> <p>That continued monitoring takes place to identify “hotspots” of contamination</p> <p>That the Adaptive Management Working Group (AMWG) proposal be adopted to enable flexibility of variable flows to enhance river health.</p> <p>Continue research into mitigation practices to reduce the environmental footprint of</p>

		<p>commercial and recreational activities. Eg. 1. N discharge in Cow urine, (see appendix A) 2. Opuha Dam power station intake positions be investigated to enhance down stream water quality3 continue research into the effectiveness of the impact of artificial freshes on river health</p>
Farming	<p>Plan Change 5 100% Irrigation efficiency is completely unattainable, good practice is somewhere around 80%.</p> <p>Utilization of New Technology</p>	<p>That the Farm Portal is robust and transparent.</p> <p>That we support the education and facilitation of the use of new technologies.</p> <p>Funding is available for research to focus on mitigation solutions.</p> <p>That we support implementation of GMP, FEP and a robust auditing process.</p> <p>That the “Overseer” modelling process is continually monitored and improved, additional new technology eg lysimeter</p> <p>That any upgrades of overseer that alter modelled nutrient leaching figures needs to be reflected in adjusted baseline figures.</p>
Irrigation	<p>Irrigation has bought greater prosperity to our community.</p> <p>A large input of capital and to supporting business’s has gone into Irrigation infrastructure.</p> <p>Community perceptions are extreme in the value of irrigation and its systems within our community</p> <p>The impact of the possible new stream depletion rule of 150 day modelling, on the viability of those affected, as Opuha Water is fully allocated.</p>	<p>Support AMWG proposal</p> <p>The investigation of on farm storage in increasing the efficient use of water</p> <p>Concerned re PC5 which suggests 100% efficient irrigation use of water.</p> <p>A robustness and transparency in the issuing of consents</p> <p>Out of catchment water be left on the table as a possibility</p> <p>The health/tension within our community be monitored in response to any decisions made re water/nutrient changes.</p>
Status of Opihi	The Opihi Lagoon is our	The investigation of the Strategic dumping

Lagoon	barometer of our rivers health	<p>of the Dredge tailings or other ways to mitigate coastal erosion (Construction of a Box)</p> <p>The enhancement of the habitat for fauna and flora in the lagoon area. Predator control, Riparian planting,</p> <p>That reserch continues into the current policies on the artificial opening of the mouth.</p>
General		<p>We have concerns re the trading of water consents and nutrient allocations. Short term leases are OK but they must not be for sale. (Eg leased land for potatoes)</p> <p>Education, industry liason, Ecan management support is funded to achieve the targets and to minimise the tension that will be generated within the community; Farmer against farmer; rural verses urban</p>

1.. The Lower Opihi Catcment Group participants:

The group is made up of a wide variety of people from various interests and occupations, who have been meeting since 23rd October 2014.

A brief discription is below.

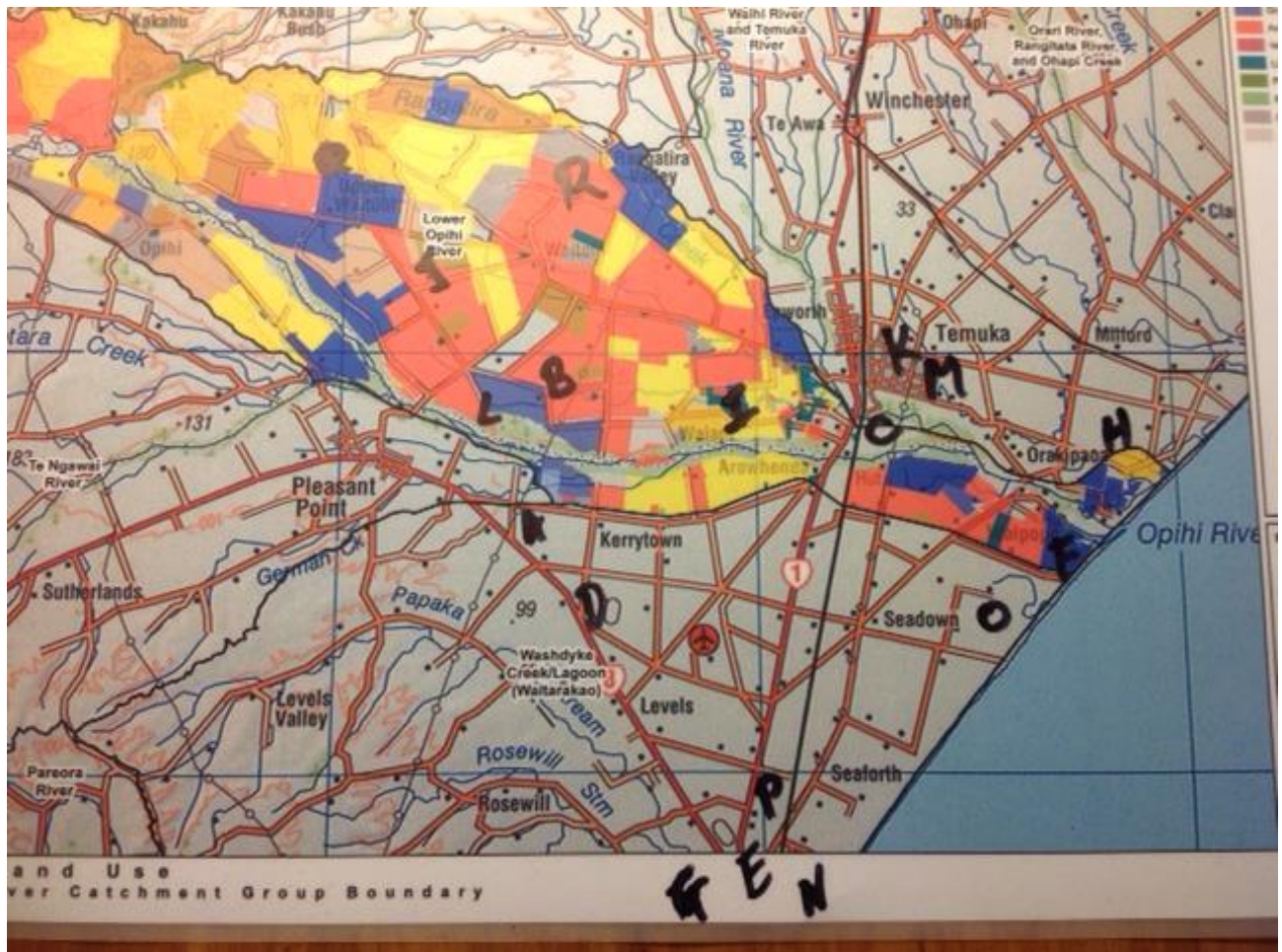
Ref Map:

- A. Innes: Lifestyle farmer/irrigator, keen river user. (has kayaked Opihi, Orari and Opuha Gorges many times)
- B. David: Farmer, Interest in Opihi River, Liason Committee member for 26 years
- C. Brendan: Dairy Farmer, NZ Dairy Business of the Year winner of Canterbury and NZ Lowest Environmental Impact
- D. Lisa: BSc (Hons) Has tremendous knowledge on water quality and river dynamics
- E. Donna: A camper on our river; Brings an urban perspective to our committee
- F. Doug: Dairy Farmer/Riparian planting specialist near the Opihi Lagoon, affected by the management of the river mouth
- G. Nicki: Banker, urban provides the glue for our committee

- H. Peter: Farmer Northside of the lagoon, irrigator. Passionate about Riparian plantings and lagoon habitat for birds, and the management around the lagoon mouth openings to maintain lagoon health.
- I. Stu: Lives next to the river. Has recently purchased the Historic Arowhenua Station. Dry land farmer, sheep and beef.
- J. Mark J: Retired farmer, grew up next to Opihi, swimming and fishing; special interest in School Creek
- K. John: Initially attended. Strong advocate for the environment.
- L. James: Zone committee member, farmer, irrigator
- M. Mark W: Zone committee member Fish and Game officer
- N. Judy: Timaru District Council Manages TDC water take/treatment
- O. Kevin: Why I am involved: "water quality and availability to irrigators and community and how it impacts our family as farmers and members of the community. What I have to do as a farmer to improve water quality, and comply with issues going forward.
- P. Lyndon: Second generation Irrigation consultant farmer and irrigator
- Q. Simon: Grew up next to the river swam and fished as kids. Farmer
- R. Jeremy: Passionate Arable Dry land farming, and has an interest in efficient ruminant diet.

Our committee has a good geographical spread of users of the River.

See the legend in the following map



Our group has had many meetings and had great discussions over the last 3 years, and field trips that we have undertaken include:

An in river (stop bank, Paul Eddy, river planting.)

Lagoon health with John Henry (local Iwi)

Irrigation efficiency field day (Brendan Caird)

Arowhenua Bush

Presentation from Dan Clark ECAN

Colin Hurst Waitaki

ADMG Julia Crossman, Mark Webb

Landcare Trust Janet Gregory

Opuha Water Ltd Tony McCormick

Have had good representation at Healthy Catchment Public meetings

Fraser Ross Forest and Bird

John Talbot Zone committee

2. The River

The Opihi River is unique in NZ as it has an in stream Storage Dam that allows for the management of flows to enhance the Recreational, Cultural and Economic uses of the river.

This river provides drinking and stock water for a large area of South Canterbury. Rural people as well as Timaru, Pleasant Point residents.
Our future aspirations for our river are for it to be: swimmable, fishable, safe and reliable flows to allow all users to be catered for.

The Lower Opihi has along history of irrigation abstraction. Years ago the Opihi has the distinction as being the first NZ river to have irrigation restrictions.

Since the construction of the Dam (1998) the river has improved in terms of flows and an increase in the sport fishery. Pre Dam construction Opihi Mouth closures were frequently up to 20 days at a time totalling up to 100 days per year. Post Dam mouth closures are far less frequent.

In the last few years we have had a flexible flow regime that has allowed river health to be maintained in very low flow years, and keeping commercial users viable.

Our view is that the Opihi Lagoon is the barometer for analysing River Health.

3. Water Quality

Our group realizes that water quality needs to be monitored and improved. We applaud the upgrade of the Sewerage systems of towns Pleasant Point, Geraldine and Temuka to the Timaru Plant and that this be continually monitored. Both wool scours in our catchment have closed, and 63kms of stopbanks have been constructed to keep the river instream and to exclude stock from the river.

Issues continue to persist from outflows from the dam according to some. Research needs to be taken into the cause and mitigating solutions.

Farm practices have been to intensify with the application of fertiliser, irrigation, sprays and changes to land use to maintain/increase production/profitability.

We believe a number of mitigation steps can be taken:

- Implementation of Good Management Practices (GMP) on farm

- That by the use of Farm Environment Plans (FEP) and these being audited ensures that GMP is taking place.

- That Ecan continue to monitor water quality to identify "hot spots" of contamination

- We encourage research into practices that may reduce the environmental impact of farming and industrial systems

- A large amount of research at Lincoln and Massey is targeted to Feeding systems, Housing, genetics, plant species, which hopefully will reduce the impact that farming has on our river.

4. FARMING

The focus of farming research has been on increasing productivity and very little has been on the impact on the environment.

In the past: Fertiliser

Irrigation

N use

Agronomy/Chemicals

Feed utilisation

Winter feeding systems (fodder beet)

Now and into the future environmental impact is factored in:

Ashley Dean are researching the impact of a winter standoff area.

Plantain possibly acting as a DCD

Genetic research impact

Efficient irrigation systems (VRI)

Case Study Brendan Caird

Since making farm improvements/developments he has reduced his N leaching by 15% from 26 to 22KgsN per Ha

This has been done by:

Changing from Rotarainers to Pivots

Installing Variable Rate application (VRI) on the Pivot irrigator

This means: no water on water courses,

No water on tracks/laneways

Installing soil moisture monitoring - water little and often

Effluent spread little and often (at rates 3 to 5mm's)

Less 'bought in' feed from outside the farm gate

Use of fodder beet (contains less protein)

Little or no N applications in April through to August

Soil testing of every paddock for fertiliser applications.

Culling cows earlier in autumn, reduced stocking rate in autumn

FEP awareness and audits shows areas for ongoing improvement.

Farmers need time to implement these new technologies which I believe will achieve realistic GMP targets.

5. Irrigation

With the increase in reliable water from the Opuha Dam the region has grown tremendously. Timaru has had a great spruce up. The business's in our area have had a prosperous few years. This would not have been possible without reliable water. We

have had a growth in carrots onions, potatoes, (Heartland Chips) arable crops, apple orchards, and pastoral farming including dairying.

6. Plan Change 5

Basically we support PC 5 concepts:

of GMP

the auditing process to monitor compliance with GMP

We have concerns with PC5 over:

The robustness of the Farm Portal and Overseer.

The achievement of 100% irrigation efficiency

7. OPIHI LAGOON

The Opihi Lagoon is of great importance to the local Iwi, and all within the local community, and is the final depository of all that happens in the wider Opihi catchment. Two of our members live on the bounds of the Lagoon and one believes he has seen a Bittern within the last 15years. We are keen to promote: Riparian planting, predator control and an investigation into mitigation avenues for slowing down coastal erosion.

The lagoon is half the size it was 150years ago.

Measures for erosion control could include a "BOX" or strategic dumping of Timaru Port dredgings.

8. General

As in any community we have a great variety of views on the value of resources within our community with water and rivers being no exception.

Any rules regarding changes that will impact on the livelihood on community members must be backed with accurate science and then communicated extremely well to the wider community.

We as a group have had many discussions across a wide range of issues and have encountered some widely varying views. Perceptions can vary widely from the true picture depending on the past experiences of those present.

We as a group predict that there will be widespread tension between those interested in the outcomes of this exercise and that the Zone committee have an Education, PR campaign, including Industry liason to minimise this tension.

Appendix A

From J Talbot July 2017

The emissions from Dairying and the solution

Over the last few years a group of internationally recognised scientist and farmers have questioned the current and past research into reducing the environmental impact of dairy farming and I have been active as the co-ordinator for this group in seeing that each of these experts research has come to the fore.

Recently a computer model has been developed for use with Overseer that predicts the differences in an animal's emissions based on the feed intake by Dr Lucy Waldron of Feilding.

So, by using this along with established rumen science and then also looking at just what the growth patterns and protein levels are for pasture and other feeds under current management conditions using DNZ data, then comparing them with what the animal can actually use, we find that there is an answer as to why we now have a huge nitrate and Nitrous oxide increase in our environment that is greater than the increase in stock numbers alone.

But by also taking this a little further and looking at how we can overcome this, we find that we can also reduce significantly our reliance on irrigation, produce more milk and also milk of a higher value that is also more suited to making the higher value products such as cheese and butters etc unlike the PKE boosted milk that Fonterra have found can cause serious problems.

The Problem

The answer lies in balancing the protein levels in the rumen, cows cannot use more than about 16-17% protein as confirmed recently by DNZ. Using Lincoln Dairy Units figures over the last 5 yrs, it would seem that the protein levels in the grass vary from month to month but from 18% to over 34%.

Actual harvestable Pasture is around 15 to 16t dm/ha per yr

Using the computer model, this shows that when grass protein levels exceed 23%, nitrates excreted in the dung and urine are at around 400grms per cow per day, rising to around 1000 grams at 30% protein in the grass.

Pasture species in NZ reduce production considerably when air temperatures reach around 26 to 27 deg, irrespective of how much water and fertiliser is thrown at them.

One of the surprises to come from collating all the information on this was that due to changes in our pasture management with improved later flowering grasses, irrigation, fertiliser and topping, we have actually raised the protein levels to nearly double what they traditionally would have been with the older grass varieties, with no irrigation and less fertiliser.

One of the most notable changes on a modern dairy farm is the complete lack of cow pats, this is due almost entirely to the high protein diet we now have and exiting the cows as a horizontal green water fall. This too has some serious environmental issues, as instead of the dung landing on the surface and broken down by sunlight and bacteria, it is now flushed straight in to the soil and depending on the soil type, straight in to our water systems raising both N and e-coli levels.

So, in summary we have certain months where the protein levels in the pastures are well above what can be utilised and so simply pass through the animals and exit as Nitrates and nitrous oxides and other GHG.

We have a minimum of around 3 months when due to temperature the pastures don't grow very well and so currently a lot of water is wasted trying make them grow.

On dairy farms today, there is little silage made and because it is only made in small lots, balage has become the system used. But this costs around 30.5c/kgdm to make as against fine chopped bunker or pit silage of 07.5c/kg DM and the balage only has a shelf life of less than 2 yrs vs Pit silage of over 20yrs. This inability to economically make reasonable tonnages of grass silage means that today's farms are very exposed to climatic events, both wet and dry as they have little or no feed reserves on hand to carry them through.

Feeding PKE only increases the nitrates issue, as it too is a high protein feed and as we now know has detrimental impacts on the milk composition.

The Solution.

By growing either Maize or Whole crop Cereal silage on around 10 to 20% of the farm we can change this around due to the Maize and Whole crop silages being low in protein and high in carbohydrates and fibre to balance the very high grass protein. Maize and to a lesser extent cereals need the higher temps and sunlight to produce the high tonnages which is why they grow best in the summer months when grass doesn't.

Maize and cereals have shown to produce 3 times the amount of dry matter for the same amount of water. (FAR trials), Maize and wholecrop silages have shown to grow tonnages in excess of 20t in only 4 months of the year, and at a time when grass doesn't grow well and the also utilise the nutrients that sit below the grass roots.

Current Maize ensiling practices here in NZ have also recently been shown by FAR to be not giving the best quality by cutting far to late. The varieties here also are still not the high cell wall digestible or the stay green varieties used in Europe, which give considerable efficiency gains over what is currently in use here.

Recently FAR research has shown that the feed value of cereal silages has also been grossly underestimated by the testing company here in NZ.

Therefore if we feed the maize or cereal silages and or grain so that a rate of around 25% to 50% of the total diet feed requirement, depending on current pasture protein levels, the Model shows that we can drop the nitrates excreted from and average of around 375-400 grams a day to less than 100grams a day.

But we will also produce around 10 to 20% more milk with an increased value of around 5-10% due to the higher milk protein captured, increase lactose levels and reduce seasonal fluctuations.

An animal on a high protein grass diet is a bit like a human on the protein only diet and with the same result, weight loss, diarrhoea and lethargic performance.

One other simple thing that does also make a difference to these losses is the time of day when a fresh grass paddock is given, by doing it in the afternoon after milking, the sugar levels in the grass is at its peak and so reduces Nitrates and GHG emissions due to the "balancing effect of the higher sugars in the diet.

So, with feeding this low protein alternative feed when grass is growing at its peak, farmers will then be able to make considerable tonnages of fine chopped grass silage as around 30% of the farms grass area will not be required through the spring. Chopped silage can be made for around 25% of the cost of the current way using baleage to make silage.

By using this chopped silage to cover the summer and any other feed shortfall, considerable savings in irrigation can be made and therefore feed quality will not compromise milk quality.

One really big advantage of the Silages is that the feed is already fermented and so the risk acidosis is small, allowing feed rates to be adjusted quickly.

The chopped silages also allows silage to be made using considerable less quantities of plastic covering.

Now combine this with some soil aeration to improve water infiltration and irrigation efficiency we really are cooking.

Trials here in Sth Cnty last year showed that with the use of a pasture aerator, pasture growth increased by around 40% with the same amount of water.

Lincoln University and its dairy farm has through its grazed grass only blinkered policy has not done this industry many favours especially when it has not pursued alternative management techniques that would have reduced the current water problems or even eliminated them. Recently DNZ have admitted that they have known of the issue since 2012 when they started looking at Forages to reduce nitrates, but only in a grazing situation.

The current "new" feed fashion of Fodder beet is also at risk of damaging our milk and meat industries through the ingestion of DDT contaminated soil when the beet is feed in situ. Farmers have already had cows die from soil ingestion blocking the rumen and milk rejected because of high DDT levels. Grazing it in situ also concentrates the dung and urine patches and pugs the soil causing higher run off of these nutrients. The only safe way to grow and feed fodder beet is to have it lifted and washed before feeding adding to the cost by about 10c/kgdm making the economics questionable.

Fodder beet with its high levels of unfermented carbs / sugars also has a high risk of Acidosis which also restricts animal performance.

One of the new developments to come out recently has been the development of a mobile NIR feed testing machine that farmers can use costing about the same as a

hi-tec plate meter but allowing the farmer to see instantly what his pasture and other feeds quality spectrum is including ME and protein levels, Another old tool that can also be used once calibrated is the nitrate test strips to test the urine concentrations of the cows to check to see if the balance is right.

Conclusion

Using this system, we can now continue to run dairy systems that do not destroy the environment as we have reduced the problem by almost 80%. We would then not require more dams to be built etc at uneconomical expense, but now have dairy farmers that can have a reliable feeding system that is far less reliant on the weather, and with the extra milk worth the extra money are in a more sustainable economic position, and all the feed is home grown in NZ which will add about \$3b + to the local economy each and every year and ensure that our milk and the products from it are more environmentally acceptable to our customers and becomes 100% traceable.

This research was started some considerable time ago in 1987 by Jeremy Talbot and Prof JM Wilkinson, then Dr Lucy Waldron from Fielding, Dr Alison Dewes from Te Awamutu, and others including farm consultants especially Peter Clarke from South Cnty.

These findings although accepted and used throughout the world have been ignored by Dr Tim Mackle and the DNZ team as it goes against their Grazed Grass only policy.

One of the things that a change in diet does is put in to perspective the small and almost insignificant role fencing of riparian strips actually does to reduce N and P levels in our waterways.

Farmers putting in covered feed pads would then find that the economic pay back is significant, but the environmental gains would be enormous. Current weather conditions show very well the need for these pads.

Recently Prof Keith Woodford from Lincoln also found that the lower level, irrigated grass only farms were the most financially susceptible farms as they were reliant on good climatic conditions 100% of the time he also recently demystified the hype around the grass feed only milk exposing the fact that NZ whole Milk powder is so low in Lactose that Fonterra has to import around 70,000 to 100,000t of lactose to boost the levels to international standards.

So finally, it would seem that govt Grants for irrigation would have been better spent on covered feed pads for the dairy industry as these would make a real positive difference.

Action required.

We urgently need to have demonstration farms set up to show the dairy industry and environmental agencies that there is a better more sustainable way other than the DNZ irrigated grass only model.

Jeremy Talbot
Temuka
24/7/2017