

Meeting of the Hurunui Science Stakeholders Group.

Wednesday 8 March. Waipara Community Hall, WAIPARA

Attendees:

- Environment Canterbury: Ian Whitehouse, Hamish Graham, Kimberley Dynes, Ned Norton, Lisa Jenkins, Mike Bennett.
- Zone Committee: John Faulkner, James McCone, Ben Ensor, Michele Hawke and Cynthia Roberts
- Fish and Game NZ: Scott Pearson
- Amuri Irrigation (AIC): Alastair Rutherford, Andrew Barton, Gavin Kemble?
- Cheviot Irrigators Group: Robb Macbeth
- Federated Farmers: Lionel Hume
- Jet Boating New Zealand: Vaughan Ingram?
- Hurunui Water Project (HWP): Christina Robb, Alex Adams, Chris Pile
- Ngāi Tahu Farming Enterprises: Ash-Leigh Campbell, Edwin Jansen
- Hurunui District Landcare Group: Joss Brown
- Greg Burrell
- Jamie McFadden

Background

A Hurunui Science Stakeholder Group has been established. These are the notes from the seventh meeting. The agenda for the meeting was:

1. Welcome and introductions.
2. Ned Norton and Kimberley Dynes presentation: *What do we currently know? ...about surface water quality... & land use... in the Hurunui catchment*

What was discussed?

Kimberley and Ned presented a summary of what Environment Canterbury conclude regarding surface water quality and landuse in the Hurunui catchment (see presentation on emailed to all participants).

Ned presented first and covered how land use patterns and associated N loss are estimated. He went on to describe how that information is used to estimate “source loads” to compare to “in river” loads, and compare these to Plan limits.

Robb Macbeth – Referred to N loss layer. In terms of what is coming out of AIC audit process, how much data is coming out? There was discussion on a process to groundcheck the MGM information.

Alastair Rutherford said that the AIC auditing process did not compare consent (OVERSEER) N losses with MGM losses from the Farm Portal. He said this is because AIC are not required to do this and do not plan to (compare losses) until we have more confidence about the Portal and the numbers it generates. Overseer is used as a tool to evaluate risks on farm, not to benchmark against MGM.

Whit pointed out that the estimates that form the GIS layer shown are done using MGM. It will be important to validate against real farms on the ground.

Andrew Barton mentioned that resourcing is an issue for AIC. Alastair will be out there auditing 200 farms to look at how practices can be improved. We know what GMP looks like out on the farm, but it is not as simple as putting a number into a computer.

Ned is interested in talking to any dryland farmers who can assist in validating N loss estimates.

Ned emphasized that there is a limited level of understanding of attenuation factor in terms of source load vs output. We are not in a position to generate source loads at a property level, but what we can do is run 'what if' scenarios in terms of what a given percentage increase in N loss/ increased irrigation/ land use change will give us in terms of changes to nutrient concentrations and loads.

Whit introduced figure on p28 which depicts relative contribution of in-river Nitrogen from different tributaries of the Hurunui (based on in-stream sampling as opposed to predictions based on land use). Phosphorous (p 29) shows a very different story. This is quite important in terms of how we develop management options because we know we need to manage N and P (as well as microbial contaminants and sediment) to meet water quality goals.

Great variability in overall load was acknowledged.

Ned clarified that for the purpose of looking at regional scale source loads, there is no need to be accurate at the property scale, we just need a picture across the catchment – only looking at a percentage increase or decrease.

Kimberley presented on what we know about water quality in the Hurunui catchment. Key messages were:

- Cyanobacteria is an issue in the lower reaches of the Hurunui River – Didymo appears to be the dominant algae in the upper reaches
- Nitrate from intensive land use in the Amuri Basin is an important source to the mainstem, with increasing concentrations in some tributary sites and for SH1
- Ecological health occasionally indicates degradation for some sites
- Swimmability is an issue for the tributary streams and at SH1 much of the time

Aquatic ecosystem health

Andrew Barton commented on the relationship between site characteristics and QMCI – low flow sites will tend to have low scores anyway (Like School Creek site), so how is it fair to use this to indicate progress? It was agreed that as irrigation efficiency increases and there is less by-wash entering streams like School Stream, they will revert to a more natural low flow state. There may be some need to review monitoring sites as this happens.

Periphyton monitoring

Cyanobacteria mat cover most problematic in Hurunui River at SH7 and SH1 (note exceedance of alert and action guidelines. Tend to carry out monitoring upstream of where people are swimming the most, so has been in a side braid the last few years. Jamie pointed out that the monitoring site is this is not a braid, it is a very small shallow part of the river, mainstem is now over the other side, so this is not representative? Kimberley noted that when we issued the health warning last year the river flow was running into the side braid.

Andrew Barton asked why don't we monitor both? Kimberley emphasized the purpose of monitoring is to protect users, not collect information for plan review in terms of river health. Andrew said we need to get data from the mainstem as well, otherwise we run the risk of people getting the wrong idea in terms of overall state of river health.

Jamie McFadden stated that how the information is used and communicated is important and needs to be clear about what it means in terms of the overall water quality in the river as well as at the swimming site. Warnings for past months may not reflect the true state of the river. Kimberly replied that we need to be able to confidently say if a river is safe to swim in.

Didymo

Shift from more didymo dominated upstream to *Phormidium* (cyanobacteria) dominated downstream.

Fine sediment trapped in *Phormidium* mats increases downstream, as does phosphorous concentration and this correlates with greater incidence of cyanobacteria.

Referred to graph on page 14 – obvious increasing trend in N concentration at SH1 from 1989 to present. Andrew Barton noted the issues with putting a trendline back to a time when data may be more relevant (say from 2009 to present to show a more recent trend). Kimberley said we try not to do shorter trends because we get a lot of noise and outliers in the data. Edwin Jansen noted the work done by Peter Brown (this was on the ten year data which saw no trend).

Scott Pearson noted influence of climate and weather patterns.

Jamie McFadden said we need a more recent trend

Andrew Barton mentioned he does not think we want to go back to 1989, because no matter what we do we are going to have an increasing trend no matter what we do in terms of mitigation.

Robb Macbeth said what he would like to see is not the trend but the variability (questioned influence of outliers on the trend). There is a trend whether we include outliers or not.

Edwin Jansen stated we don't know from concentrations alone what the prevalence of nuisance growth will be – we know the key driver flow – if we see more than 60 days of low flow, we know there will be nuisance growth.

WQ Monitoring in Tributaries

Edwin Jansen said it is really unclear how we can improve the situation with *Periphyton* (based on Cathy Kilroy's work). Agreed that despite this there is no excuse for not acting.

Jamie McFadden pointed out issue with tributaries with higher P concentrations but less cyanobacteria. Should we be dosing the main stem with phosphorous to prevent growth of cyanobacteria?

Ned cautioned that there are a variety of factors can influence cyanobacteria.

Kimberley mentioned that substrate size has a huge influence. All of the tributaries have smaller sized substrates which means they get turned over at much lower flows.

There are higher levels of P in the tributaries, but the good news is we are seeing declining trends in the Pahau, Dry Stream, Waitohi, and St Leonards Drain.

There are issues with nitrate toxicity in some spring fed creeks in Amuri Basin – Plan limits and NOF bottom lines are not met in Pahau Drain and St Leonards Drain.

Andrew Barton noted NOF bottom lines never would have been met either. He also pointed out that limits on drains in similar settings in others parts of the region were set at around 5 or 6mg/L (which these streams would meet). Cautioned that Dry Stream will go dry once AIC piping goes in. Acknowledged also that reduced flows in Pahau Drain and St Leonards drain will also change the concentration.

Wadeable and Swimmable

An attempt to simplify the overall package of information – raised a number of questions.

Andrew Barton stated that there are plenty of places where AIC would dispute this summary. Not all tributaries reflect an 'unhappy' face or area where we could really focus on for improvement.

Edwin Jansen stated that there is a whole river above the Mandamus – it could include didymo and sediment – so lets not lose sight of the fact we are going to be managing the whole river. Why would we forget about the adverse impact of didymo when we have an option to manage it? If you are going to manage water we need to manage the whole catchment.

Alex Adams asked why is there a sad face on main stream Hurunui below the Mandamus for nitrogen? Kimberley answered that it relates to plan objectives for *Periphyton* rather than nitrogen (which relate to toxicity).

Jamie McFadden said that every summer people swim and fish in the river, and there is not much time that you can't. Kimberley noted the limitation of information collected at a particular spot on a particular time on a particular day – they are looking at risk as opposed to what a specific person is exposed to. Kimberley also emphasized that visual appearance is often deceptive with very clear looking water sometimes having high measured *E.Coli*.

Edwin Jansen asked why do we not just focus scientific work on January, February and March – which is when *Periphyton* grows and when people are exposed to risk. Kimberly answered that we need to look year round because in winter N concentrations can be really high (approaching toxicity levels) and if we left the winter period out we would miss this.

Alex Adams asked how do we incorporate or acknowledge how long it will take for our good work to show up as a statistically significant improvement? It is a long slow process.

Lionel Hume said he thinks the really important thing about making a decision is the current trend. Excessive focus on a long term trend can lead to a failure to account for improvements that are taking place, or the reverse.

Scott Pearson mentioned the role that fine sediment might have in the proliferation of cyanobacteria.

Final statement [p24s2]

Edwin said we may not be able to achieve objectives all the time – preferred a reference to preventing further deterioration in freshwater outcomes. Also sought an acknowledgement that freshes and floods are the most effective means of managing *Periphyton* accumulation (in light of the fact we are managing flows all the time anyway). Cathy Kilroy said very small freshes and floods can have a significant effect on *Periphyton*.

Robb Macbeth said we do not have control over significant flood events.

Christina Robb said we are going to be asking a whole lot of things – a lot of people with farm environment plans – we need to be careful of expectations that might arise from trying to capture everything – especially given the limitations in what we know.

The meeting concluded.

Next meeting - Wednesday 29 March. 4.00 – 6.00pm. St. Johns Hall. AMBERLEY

Focus of workshop will be on what additional information is needed.