

Combined Kaituna and Pongakawa-Waitahanui Freshwater Futures Community Group Workshop 8 Notes: Surface water quality

The Orchard, 20 MacLoughlin Drive, Te Puke

Wednesday, 26 September 2018 commencing at 9.00am

Members present: *Kaituna Community Group* - Barry Roderick (Chair), Brian Thomas, Hendrik Metz, Hohepa Maxwell, Ian Schultz, Jon Fields, Julian Fitter (in both K & P CG's), Manu Wihapi, Mary Dillon, Matthew Leighton, Murray Linton, Nick Webb, Peter Ellery, Richard Fowler, Warren Webber, Councillor Paula Thompson.

Pongakawa-Waitahanui Community Group - Wilma Foster (Chair), Andre Hickson, Bernie Hermann, Bev Nairn, Dennis Walker, Geoff Rice, Grant Rowe, John Cameron, Julian Fitter (in both K & P CG's), Mike Maassen, Paul Van der Berg and Councillor Jane Nees.
Additionally attendee Councillor Norm Bruning.

Apologies: *Kaituna CG* - Claudia Hellberg, Cor Verwey, Doug Hallberg, Jeff Fletcher, Jessica Dean, John Fenwick, Maria By de ley, Maria Horne, Moran Bramley, Vivienne Robinson

Pongakawa-Waitahanui CG - Colin McCarthy, Darryl Jensen, John Garwood, John Meikle, Kepa Morgan, Kevin Marsh, Melv Anderson, Stavros Michael, Te Awhi o Te Rangī

BOPRC Staff present: Pim de Monchy (Relationship Manager); Stephanie Macdonald (Facilitator), Kerry Gosling (Facilitator), Natalie Ridler (Support Facilitator); Nicki Green and Jo Watts (Senior Planner – Water Policy), Paul Scholes (Water Quality, Science Team Leader), Rochelle Carter (Environmental Scientist)

Related documents previously circulated:

1. Workshop paper: Surface water quality.
2. Kaituna-Pongakawa-Waitahanui Water Management Area: Draft measurable objectives to support in-river values.
3. Workshop paper: Analysis of contaminant mitigation costs and effectiveness

These papers and the workshop presentation are available online [here](#). A copy of the full PerrinAg and Landcare Research Analysis of Contaminant Mitigation Costs and Effectiveness report is available [here](#).

1. Welcome/Purpose

Wilma welcomed everyone to the combined workshop which was opened with a karakia by Manu Wihapi. Steph highlighted there were three BOPRC councillors present and also introduced Natalie Ridler, Community Engagement Advisor based in the Rotorua office.

The purpose of the Freshwater Community Groups is to help Council implement the National Policy Statement for Freshwater Management:

- confirm community values, express preferred objectives
- provide input and feedback on limits and methods for freshwater quality and quantity within this WMA
- provide input to and feedback on solutions for managing activities to meet those limits
- advise Council in their decision-making for plan change 12

1.1 Agenda and purpose for this workshop

Staff outlined the agenda and purpose for workshop 8.

Agenda:

- Welcome
- National and regional update
- Progress and next Steps
- Model development
- Contact recreation
- Ecosystem health – Suspended Solids / Nitrogen /Phosphorus
- Mitigation approach (if we have time)
- Next steps

The purpose of this workshop is to: gauge members' comfort with the draft measurable objectives; present surface water quality information from the modelling, and further gauge members' comfort with the information presented.

2. National update

Nicki noted expected changes the government are signalling to the National Policy Statement for Freshwater Management (NPSFM) and/or National Environmental Standards. This includes adding sediment as an attribute and looking at ways to halt the decline of water quality.

Central government has indicated there will be discussion documents published in early to mid-2019, but there is uncertainty as to scope and content at this stage. Central government appears to be considering ways to manage land use intensification to halt water quality decline and has recently asked Councils to list catchments at risk, potentially with a view to prioritising policy and investment.

Staff are keeping a close eye on government work programs and signalled legislative changes, and continue to provide input where we can. We are still in a pre-drafting part of the plan change process so can adapt to changes if need be.

3. Regional update

Nicki noted:

- the Kaituna River Document has been approved by Te Maru o Kaituna River Authority and came into effect on 1 August 2018. It includes a vision, objectives and desired outcomes that will need to be recognised and provided for in a change to the Regional Policy Statement and within PC 12.
- Plan Change 9 (Region-wide water quantity) decisions have been made and will be notified on 9 Oct 2018, after which submitters may make appeals to the Environment Court. PC 9 is a "hold the line" interim step until catchment specific water quantity limits are set for the Kaituna-Pongakawa-Waitahanui and Rangitāiki water management areas, which is part of the plan change 12 process.

Key discussion points:

- Concern was raised there may be a risk that people will need to go through a resource consenting process required by PC 9 and then all over again under PC12. Resource consents are issued for a particular duration. Unless there is a need to clawback water quantity in catchments identified as over-allocated under PC12 there is unlikely to be a risk of further requirements for existing consented users.
- Cr Nees also shared that PC9 sets interim water quantity limits which are conservative, apply region-wide and it also embeds the catchment by catchment specific process we are following for PC12 into it.
- A member made the point that there is a serious message in all of this. We can no longer take water for granted and everyone needs to respect that. Staff agreed that this is the case, and is the reason the NPSFM directs regional council's to set appropriate limits and manage water quantity and quality.

3.1 Catchment work in progress

Pim provided an update on actions in the Kaituna-Pongakawa-Waitahanui catchments since the last community group meeting and highlighted the following:

- a) Te Maru o Kaituna are holding a public celebration about the Kaituna River Document at Waitangi, Rangiuru Reserve on 30 September. All are invited to come along. If you can't come, do take the time to read the KRD or summary as it informs the work we are doing in the Kaituna catchment.
- b) Kaituna re-diversion: Good progress is being made towards completion by June 2020. Work is on track and may be done sooner if we keep up the current pace.
- c) Kaituna wetland extension project is making good progress and likely to have a consent lodged by April next year.
- d) Year end to 30 June 2018 highlights include:
 - 35km of waterway protected from stock
 - 12 ha of new wetlands in partnership with landowners
 - Partnerships with care groups
 - Working on three priority sub-catchments – Puanene Stream, Kopuaroa Canal and Waitipua Stream
- e) The Rivers and Drainage Bylaw is being reviewed.

Pim also provided an update on four resource consent applications which may be of interest to members:

- Pukepine application - delayed to give time to install and trial treatment ponds which look to be working. A hearing date is expected to be set for November.
- AFFCO application is currently on hold. Council is waiting for further information requested under s92 RMA about cultural effects and further in-stream ecological assessment.
- Te Puke Waste Water Treatment Plant application is also currently on hold. Council is waiting for further information requested under s92 which includes a fuller in-stream ecological assessment. District and regional council are aiming to publicly notify this application before the end of the year, with a hearing expected early in 2019.

- Western Bay of Plenty District Council currently have their draft Catchment Management Plan for urban stormwater from Te Puke, Paengaroa and Maketū open for public feedback. See details [here](#).

Key discussion points:

- Waste water treatment wetlands have benefits in terms of stripping nutrients but do not remove or treat *E. coli*. As the RMA consenting authority the regional council can ask for further information demonstrating what the effects of a proposal are, but the consent authority can't make applicants change their proposals to the regional council's preferred option.
- The Ford Rd pump station application is currently in the pre-consenting design stage. The most likely option is to move the pump station from Ford Rd about 2km upstream near the diagonal drain. Pumped water will then go out to sea rather than through Maketū. Given the level of interest it is most likely there will be some level of notification.

3.2 Progress and next steps

Nicki provided an overview of progress made and the next steps which included:

- Timeline/ Calendar
- Outcomes sought today
- Work in progress
- What next

Staff anticipate having a discussion document for the wider public around mid-2019 before publishing the draft plan change. Progressing a discussion document is partly in response to councillors' request to make sure the wider community understand the issues and what needs to happen. Iwi engagement is continuing.

Key work in progress includes work on groundwater modelling and coastal receiving environments which will be provided to community group members as soon as it is available. These are important parts of the puzzle and will likely drive groundwater quantity, and water quality limits needed.

Nicki reminded members of the National Objectives Framework (NOF) process we have to work through under NPSFM and that the groups have worked on their preferred state for in-river values. Now we are tying measureable attributes to your preferred states. Today we will be talking about attributes and draft objectives and the key contaminants for setting limits.

Actions:

1. Staff to share modelling technical reports once published.

Key points from the discussion:

- We may have to set limits at the bottom of the catchment and possibly some further up-stream depending on the extent and type of issues to be addressed.
- The government has indicated it is considering introducing estuarine objectives and/or limits. To set estuarine limits would need changes to be made the NZ Coastal Policy Statement.
- The government has also indicated it may introduce sediment as an attribute. Our scientists have already recommended sediment as an attribute.

3.3 Model development

Nicki invited Nic Conland to provide an overview of the SOURCE model and its development. Nic outlined the key components of the model using the diagrams in the presentation. The model uses generalised information about the catchment at key points to provide catchment scale results for *E. coli*, Total Nitrogen, Total Suspended Solids (or sediment) and Total Phosphorus.

Key points from discussion:

- Significant effort has gone into calibrating the modelling outputs with monitored data. Industry organisations were consulted during the model build.
- The current land use map has come from the Land Use Database, aerial photography and has been further 'ground-truthed' by visiting sites. We have also asked for feedback at workshops. Staff are confident in the land use map but do note there will be changes over time as land use changes.
- A report detailing the modelling assumptions and development will be available in the near future.
- Modelling runs use data back to 1972. The results presented related to the 2011-2016 (a 5yr period). Land use change or development scenarios estimate credible change over the next 30 years.
- Concern was raised about whether we fully understand what is going on underneath the ground. Nic explained the SOURCE model makes assumptions about this. The MODFLOW model (groundwater model) does drop down into different layers under the surface so what is going on under the ground can be factored in.
- Data from monitored sites has been used in model calibration, but since we can't monitor everywhere, a model is used to estimate the rest.
- Concern was raised about how much confidence we have in the accuracy of modelled results to support the policy making decisions. Staff are reasonably confident the model will provide a decision-making support tool at the Freshwater Management Unit and sub-catchment scale rather than property by property. The same process and model is being used in other places around the country and the model we are using is conservative.
- The health of Maketū and Waihi estuaries is a concern. Modelling results do show the loads increasing down near Te Tumu which will give members the confidence the model is picking up the intensive agriculture. We do have monitoring sites at Te Tumu and this data was provided to the modellers. The estuarine part of the catchment is part of the coastal receiving environment work underway to estimate the reduction in loads from the catchment that are needed to support estuary health.
- A member posed the following question to the group. Is there was anyone in the room that doesn't think we need to improve water quality and that we need to be accurate and confident in the work we are doing? No opposition was raised.

Actions:

2. Staff to come back to members about how many groundwater monitoring sites there are.

4. Contact Recreation / *E. coli*

Staff noted the Kaituna River Document desired outcome and the group's preferred state objective for contact recreation. The working draft measurable objectives for *E.coli* were shared and feedback sought.

Staff suggested that what people want could be achieved by the following three draft measurable objectives:

1. Maintaining *E.coli* concentrations in Freshwater Management Units where *E. coli* concentrations are in the A or B band, including arresting any worsening trends;
2. Improving *E. coli* concentration to at least the C band, but preferably to B band, in Freshwater Management Units where people swim and concentrations are currently in the C, D or E band.
3. For rivers discharging to Waihi and Maketū estuaries, maintaining or reducing *E. coli* concentrations to support safe contact recreation in the estuaries. The scale of improvement required is still being estimated.

Staff presented monitoring and modelled results for the current state, naturalised scenario and two potential future scenarios.

4.1 Gradients of agreement

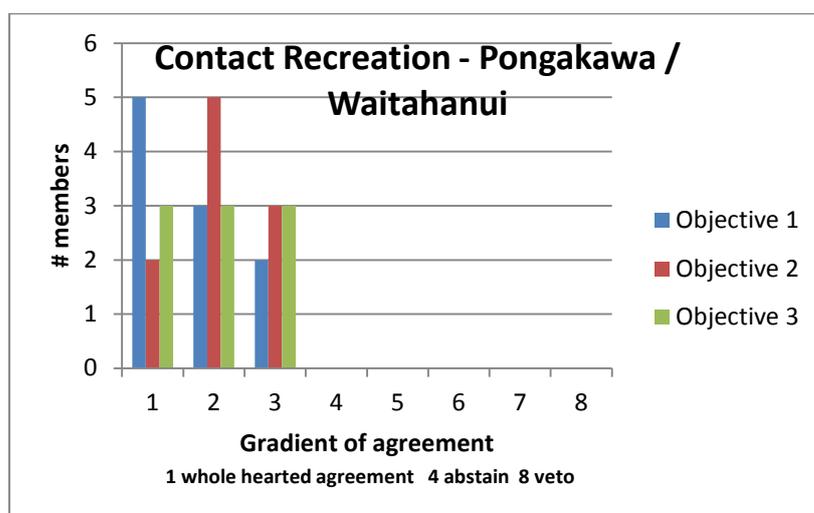
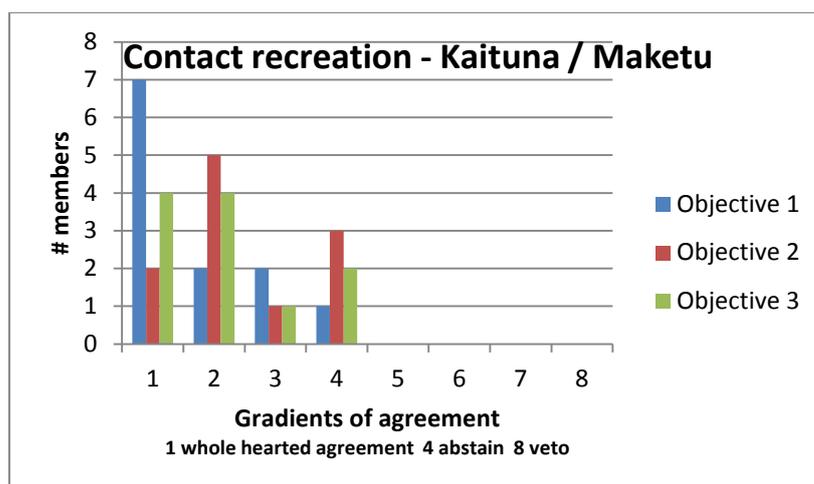
Steph introduced the gradients of agreement / level of comfort tool. Group members were asked to indicate their *gradient of agreement / level of comfort* with each of the three draft measurable objectives for contact recreation - *E. coli* using the following scale. The group noted the activity *does not* mean the group has formed its recommendation to Council.

Gradient of agreement / Level of comfort	
1	Whole hearted agreement
2	Agreement with minor point/s of contention
3	Support with reservations
4	Abstain
5	More discussion needed
6	Don't like but will support
7	Serious disagreement
8	Veto

Sixteen members of the Kaituna community group and twelve members of the Pongakawa-Waitahanui community group attended workshop 8. Gradient of agreement feedback sheets were collected after the group exercises from twelve Kaituna CG members and nine Pongakawa-Waitahanui CG members and a further member who did not indicate which CG they were in (which was added to the Pongakawa/Waitahanui graphs).

Data from the twenty two feedback sheets were collated and graphed for each of three contact recreation objectives and ecosystem health, sediment, nitrogen and phosphorus. As can be seen from the graphs, not all members provided scores for all topics resulting in a low numbers in some of the graphs particularly towards the end of the exercise.

Gradient of agreement / Level of comfort scale with each of the three draft measurable objectives for *E. coli* for contact recreation:



Generally members from both the Kaituna / Maketū and the Pongakawa/ Waitahanui groups supported the draft measurable objectives for contact recreation with the exception of a small number from the Kaituna group who chose to abstain.

Comments recorded on the feedback sheets:

Objective 1: Concerned about food gathering in both estuaries, an objective should be an improvement, aspirational irrespective of the 'band'.

Objective 2: Measure is required – fari / good?, B should be the target, an objective should an improvement, swimmable/safe/advisory/unsafe, aim for A band.

Objective 3: Reduce!, prefer reducing, always improvement, aim for A band.

Key points from discussion:

- The risk of getting sick is low within the A band. For at least half the time the estimated risk is <1 in 1000.

- Bands A – E have been set in the NPSFM. A, B & C are swimmable, D & E not swimmable. See [Appendix 2 of the NPSFM](http://www.mfe.govt.nz/sites/default/files/media/Fresh%20water/nps-freshwater-amended-2017_0.pdf) http://www.mfe.govt.nz/sites/default/files/media/Fresh%20water/nps-freshwater-amended-2017_0.pdf
- Natural levels of *E. coli* would include wild bird poo etc.
- Drinking water needs to contain < 1 of *E. coli* per 100ml of water
- How can sections of a river go from C to D and back to C like the Pongakawa is showing? This can happen due to different hydrology, rainfall, soil, slope, land use in different sections of the river. As in this case, there may be other tributaries coming in downstream which can have a dilution effect. In this case the Puanene is likely to be causing high *E. coli*. Exploring the sources of *E. coli* will need to be further investigated if it needs to be reduced.
- We have had a very wet September and rainfall patterns are likely to change due to climate change. A query was raised as to whether a definition of heavy rainfall was needed if it is going to form part of a measurable objective. The model calculates rainfall hourly then daily, checking soil moisture levels and accounts for this.

Actions:

3. Provide a better explanation about the NOF bands. See the National Objectives Framework in the National Policy Statement for Freshwater Management http://www.mfe.govt.nz/sites/default/files/media/Fresh%20water/nps-freshwater-amended-2017_0.pdf
4. Provided detail about which animals were included as part of the naturalised modelling scenario.

5. Ecosystem Health

Staff noted the Kaituna River Document's desired outcomes and the community groups' preferred state objective for ecosystem health.

Restore, protect and enhance the ecosystem health, habitats support indigenous species and wetlands

Improve ecosystem health in the lowlands, protect and enhance elsewhere

It is clear from both community groups they would like ecosystem health improved in the lowlands and that the Kaituna River Document sets a higher expectation.

Staff presented current state monitoring information for ecosystem health in the Kaituna-Pongakawa-Waitahanui catchments and presented the approach to the draft measurable objectives, i.e., A or B band applied and to arrest worsening trends. Refer to Table 3 in the Kaituna Water Management Area: Draft Measurable Objectives to Support In-river values document.

Key points from discussion:

- Uncomfortable with the high temperature coming out of the upper Kaituna, Lake Rotoiti (25 degrees). Ohau wall has had an influence on temperature.
- There is a cause and effect for some attributes such as DO, acidity and toxicity. Monitoring of point sources needs to measure above and below point sources to confirm whether issues are caused by a point source or otherwise.

Estuarine

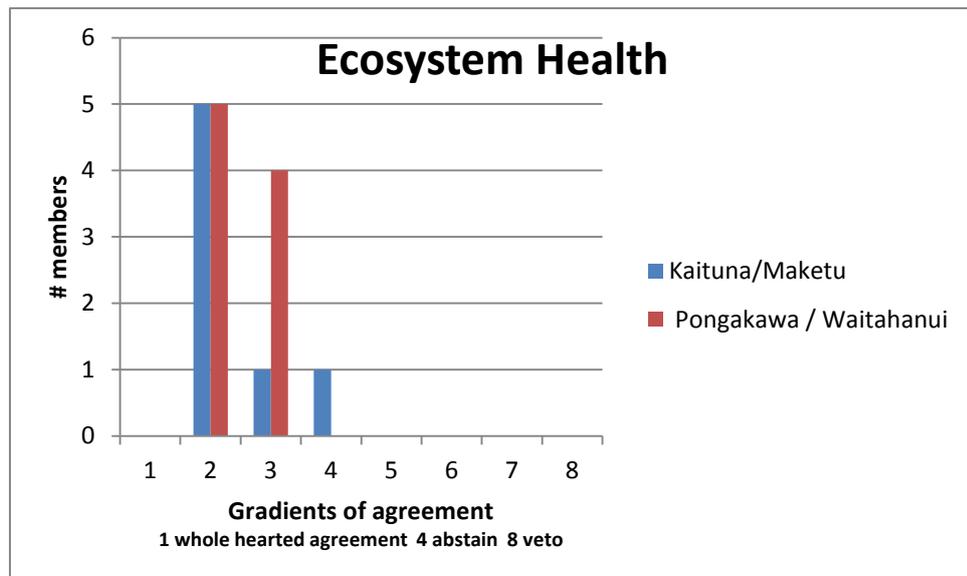
- Concern was raised about why the data presented doesn't show estuaries or closer to the coast. Members noted that the results presented only show down to Te Matai, which they considered to be too far up stream. Members felt we ought to be measuring as far down the river as possible.
- Staff confirmed council do monitor past Te Tumu and modelling goes down to Te Tumu, however, this is within the coastal environment which is not part of this catchment modelling. A snapshot of 2016 data at Te Tumu shows it is still within band A but nearly in B. Because of its high salinity it doesn't fit into the NPSFM freshwater framework. Science is working on the coastal receiving environment which is another key part of the puzzle. The link is coming but isn't part of today's conversation. By in large estuaries and the coastal receiving environment are more sensitive than the rivers.
- Members raised concern about a disconnect between river health and the coastal receiving environment. Staff advised the river is receiving water from drains and work was underway on both the drains and the coastal receiving environment.
- A query was raised about whether degradation of estuaries is linear, graded or is there a tipping point. This is a question we will need to take back to the coastal scientist to answer.

Macroinvertebrates

- MCI index is one way to measure ecological health. Our scientists have recommended we use the best parts of each of the MCI, EPT, and the BOP_IBI. To simplify the use of three attributes that described specific aspects of the invertebrate communities at each site, they were combined into an index, which is what is shown on the map presented.
- Ecosystem health = presence of the bugs in the water. If MCI is bad it is not necessarily because of high nutrients, there are a number of factors that influence MCI health.
- Poor MCI for the Mangorewa was noted which may need further investigation.

Group members were asked to indicate their *gradient of agreement / level of comfort* with the draft measurable objectives for ecosystem health using the 1 – 8 scale with one being 'whole hearted agreement' and 8 being veto. The group noted the activity *does not* mean the group has formed its recommendation to Council.

Gradient of agreement / Level of comfort scale for ecosystem health information: How comfortable are you that the measurable objectives reflect your aspirations for ecosystem health?



Comments recorded on the feedback sheets:

Feel like we need to take the scientists word as numbers don't mean much to a non scientist, don't want D band, don't feel qualified to judge, must go all the way to the estuary, cause and effect needs to be considered.

Actions:

5. Provide lowland drains report to members once published.
6. Share the coastal receiving environments information once published.
7. Is the degradation of estuaries linear, graded or is there a tipping point? A question we will need to take back to the coastal scientist to answer.

6. Sediment, Nitrogen and Phosphorus

Staff presented cumulative load graphs and sub-catchment yield/source maps for sediment (total suspended solids), nitrogen and phosphorus for naturalised, current, and two potential future scenarios which are detailed in section 4 of the briefing note.

Rochelle explained the results presented in this section are modelled results (not monitored) and these results do go down further than Te Matai.

6.1 Sediment (or Total suspended solids load & yields)

See 4.3.1 on page eight of briefing note and pgs 12-14 for graphs. Rochelle worked through the Naturalised, Current state and each of the Development scenarios C & D noting that loads are cumulative and increase downstream as flow also increases.

Key points from discussion:

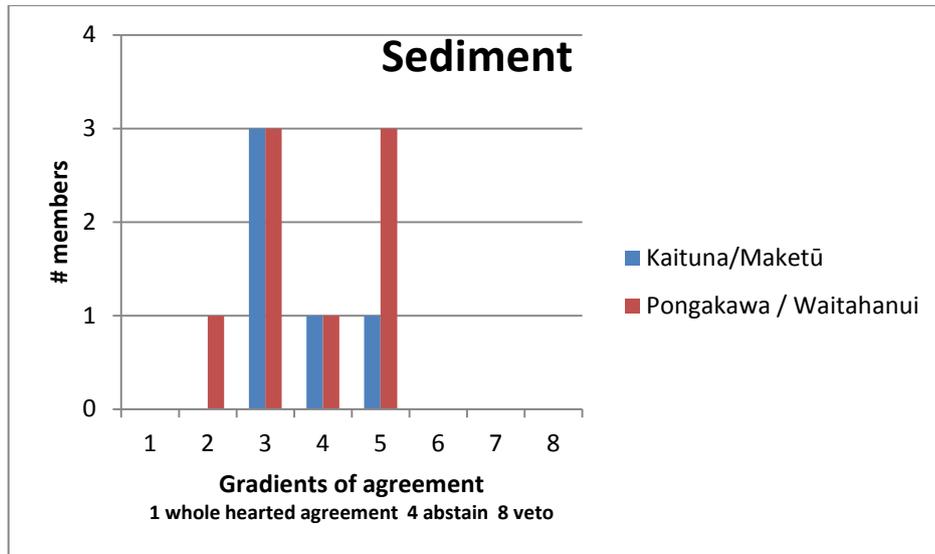
- By comparing naturalised and current state results we can infer the sediment generated by productive land use/caused by human activities.

- Forestry results were worse than members expected with modelled results showing large amounts of sediment being generated from forestry. The forestry sector have been involved in the model development, provided input into assumptions around forest harvest cycles. The sector will also review the technical report on the model assumptions, such as different forest age classes/stage of rotation at any one time.
- Our monitoring data has been used to calibrate the model but because water quality monitoring is monthly a range of conditions can be picked up. Modelling provides daily data and is often a much closer match to what is actually happening especially in regards to catchment loads.
- This is a cumulative graph so shows the influence of tributaries coming in.
- Modelling Development scenarios C & D is a way to test the model. These aren't necessarily the future we want but what we have heard may be a credible future.
- Mitigations have not been added to the modelling yet. The Development scenarios assume the same land management practices as assumed for the Current state scenario. We will also need to model some mitigations bundles as well to see if good practice (M1 bundles) may be enough to get the results we are looking for.
- Development scenario C shows an increase in sediment compared to current state. The modellers have indicated this is driven by changes in land use to forestry in the upper catchments.
- Flow rates are built into the model which is calibrated against actual flow rates. All we know about flow has been provided to the modellers.

Rochelle shared the total suspended solids yields explaining that when looking at yield maps we are just talking about the yield generated from/in little sub-catchments which effectively turns off what is coming in from upstream (or the cumulative part). Yield maps are good to see where hotspots are and have a look at why.

- Queries were raised about the source of suspended solids around Pukehina. Staff will need to look further at the land use within this catchment.
- Members are seeking more certainty the modelling is right. Forestry results are concerning and do not seem right. Staff are awaiting the modelling assumption report, which will be provided to industry (including forestry) for review.
- Nic explained that the model factors in bank erosion, hill / slope erosion, gully erosion but we don't have specific data on each. LIDAR and contour data will allow us to split these later if we need to.
- Pim to provide links to case studies on sediment and erosion.

Gradient of agreement / Level of comfort scale for confidence in results and conclusions for sediment information:



Comments recorded on the feedback sheets:

Lake of information, more information needed, where does geothermal fit in, need to analyse effect of sediment on Waihi estuary drainage.

Actions:

- Provide links to published literature about sediment loss rates from forestry compared to other land uses on this type of slope and soils. NIWA Tauranga Harbour catchment study 2010 and other relevant publications, including those relied on for setting modelling assumptions.

6.2 Nitrogen

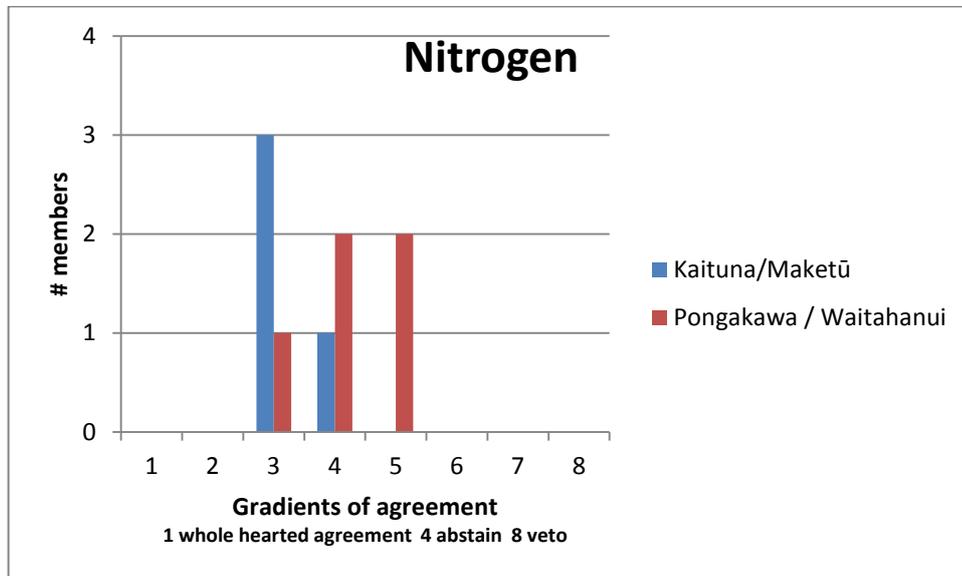
See 4.3.3 on page eight of briefing note and pages 14-15 for graphs. Rochelle worked through the Naturalised, Current state and each of the Development scenarios C & D noting that loads are cumulative and increase downstream as flow also increases.

Key points from discussion:

- Nitrogen levels start off relatively low at the top of the catchment, with the smallest difference between natural and current state, due to the moderating impacts of the lakes acting as a 'nitrogen sponge'.
- Nitrogen load increases downstream as flow also increases. There is also a larger change between the estimated natural and current loads downstream reflecting the increase in human made load from more intensive land use.
- Development C has a large wetland area, the effect of which can be seen in the results.
- One member had a gut feel that this isn't right yet as we can't look at our farm, our locality and check if feels about right yet – however the scale of the model is at the sub-catchment level – it is not a farm-scale model and was never intended to be, so this will not be an option with the model. Another member wished to abstain from the gradient of agreement scoring.

- More discussion was needed about the drivers of change in each of the development scenarios to better understand the differences in results.
- Nicki highlighted that the technical review and report about modelling assumptions are important to the community groups and staff in order to feel comfortable with the results.

Gradient of agreement / Level of comfort scale for nitrogen information:



Comments made included: gut feeling it is not right yet, too generic (although models at a catchment / regional level always need to make generic assumptions), more discussion needed about drivers, need to know more to be comfortable (one member abstained)

6.3 Phosphorus

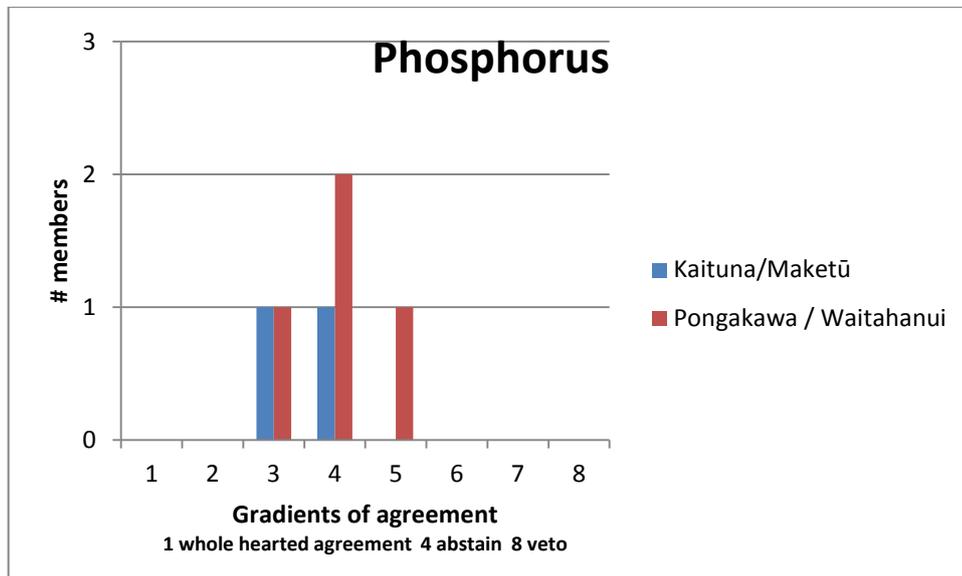
See 4.3.2 on page nine of briefing note and pages 16-17 for graphs. Rochelle shared the naturalised, current state and each of the Development scenarios C & D noting that loads are cumulative and increase downstream as flow also increases.

Key points from discussion:

- A similar pattern to nitrogen was noted for the cumulative graphs.
- Information around what is driving some of the results will be coming in the modelling report.
- It was noted that the back of Maketū and Waihi estuaries are different under natural state and Development C which both had large wetland areas. Staff will look into this and scale maybe behind this difference as we are talking about yield which had a small scale.
- One member was concerned that these results are different to the mitigation report. Rochelle confirmed that the SOURCE model results aren't related to modelling done in the mitigation report.
- Mitigation bundles look to be making better progress than the land use change. Staff clarified we are not proposing land use change. The development scenarios are examples of what might happen in the future based on community group and industry predictions.

- A member noted that results from forestry land uses look to be worse than dry stock. Information around what is driving some of the results will be coming in the modelling report.
- Nic shared that there is usually a relationship between sediment and phosphorous but actual monitoring data is showing something unique here. Nic has modelled dozens of catchments and notes that the monitoring data shows this one is behaving differently. We could not model phosphorus using a relationship with sediment.

Gradient of agreement / Level of comfort scale for phosphorous information:



Comments recorded on the feedback sheets: More information needed

7. Mitigation Bundles

At the last workshop, the community group provided feedback on mitigation bundles. The bundles were amended in light of those discussions and further work done on the economic cost and contaminant reduction in the report prepared by PerrinAg. The briefing note circulated summarised the key points of the report.

Staff intend to use the SOURCE model to ask:

- Firstly, what if everybody improved their practice to include basic good practice? (the M1 bundle); and then, if that is not enough to get the results we are looking for ...
- What if more advanced mitigation actions were also applied in key areas? (such as the M2 and M3 bundles)

The big question is will these mitigations be enough to achieve our measurable water quality objectives we have discussed already (including measurable reductions being estimated for estuaries). Before we model scenarios we will be seeking further internal and industry group review.

Key discussion points:

- M1 Dairy 8. reductions in seasonal stocking rates – need clear definition of what seasonal means.
- May need to be more specific than applying M1 to the whole catchment as a blanket approach. For example - Growing plantain on peat land is not an option.
- M1 Dairy 14. Noted difficulty getting slow release P.
- How would we assign mitigations in the model? Nic explained that each bundle can be modelled as a package.
- It was noted that these are just 5 theoretic farms not real farms.
- Abatement curves and mitigation bundles. Are they cumulative? How do I know which is more applicable to me. Nic explained that combinations of bundles contribute to the overall catchment budget. Those types of discussions can become quite real. If we know what our budget is, the question becomes how do we get there.
- The point was made by one member that he really dislikes % reductions from the current state as it encourages the dirtiest farming possible and discourages best practice actions and acting now. Fed farmers have also indicated they don't want to go down a grandparenting path. Staff hear you.
- If we reduce nitrogen by mitigations our actions are not reflected in OVERSEER for some actions (e.g., plantain). Staff indicated we haven't said we will be using OVERSEER to monitor this.

Actions:

9. Provide feedback on the PerrinAg Economic impact report and mitigation bundles paper to directly to Santiago: Santiago.Bermeo@boprc.govt.nz

8. Closing / Next steps

Staff summarised the next steps and intention to hold another workshop early December before checking back that we covered 'outcomes sought today'.

Nicki also highlighted Santi is working on a region wide economic barriers and opportunity project associated with water. There was enough interest from the combined group to invite everyone to a session.

Wilma summed up with Chair's final comments, thanking regional council for the work that's going into this. At times we were with you and at times not. Really appreciate the support team. We all need to get a better understanding of it all. Keep reading.

It is good to hear everyone's point of view. Working together we are all heading in the same direction from different perspectives. The community outcome will be stronger if we work together.

Manu closed the workshop with a karakai at 3pm.

9. Actions noted

1. Staff to share modelling technical report once published.
2. Staff to come back to members about how many groundwater monitoring sites there are.
3. Provide a better explanation about the NOF bands. See the National Objectives Framework in the National Policy Statement for Freshwater Management

http://www.mfe.govt.nz/sites/default/files/media/Fresh%20water/nps-freshwater-amended-2017_0.pdf

4. Provided detail about which animals were included as part of the naturalised modelling scenario. The naturalised state modelling assumed wild/feral animal faecal matter such as wild populations of deer, possums, birds and aquatic species.
5. Provide lowland drains report to members once published.
6. Share the coastal receiving environments information once published.
7. Is the degradation of estuaries linear, graded or is there a tipping point? A question we will need to take back to the coastal scientist to answer.
8. Provide links to published literature about sediment loss rates from forestry compared to other land uses on this type of slope and soils. NIWA Tauranga Harbour catchment study 2010 and other relevant publications, including those relied on for setting modelling assumptions.

Here is the link to the [NIWA Tauranga Harbour Sediment Study May 2010](#). See page 5 and Table 1 for the key findings.

<https://www.boprc.govt.nz/media/32623/NIWA-100721-THSS-B2-CatchmentModelResultsAmendedMay2010.pdf>

There are also other [consultant publications](#) including reports by NIWA on this same study which may be of interest here: <https://www.boprc.govt.nz/plans-policies-and-resources/publications/consultant-publications/>

9. Members to provide feedback on the PerrinAg Economic impact report and mitigation bundles paper to directly to Santiago:
Santiago.Bermeo@boprc.govt.nz
10. Staff to invite all community groups to a region wide barriers and opportunity project session.
11. Members to contact Natalie.ridler@boprc.govt.nz to register your school for the [Hands on water expo](#) which is a freshwater learning day for year 4-8 students to be held at Redwood Valley Farm on 13 & 14 Nov 2018.