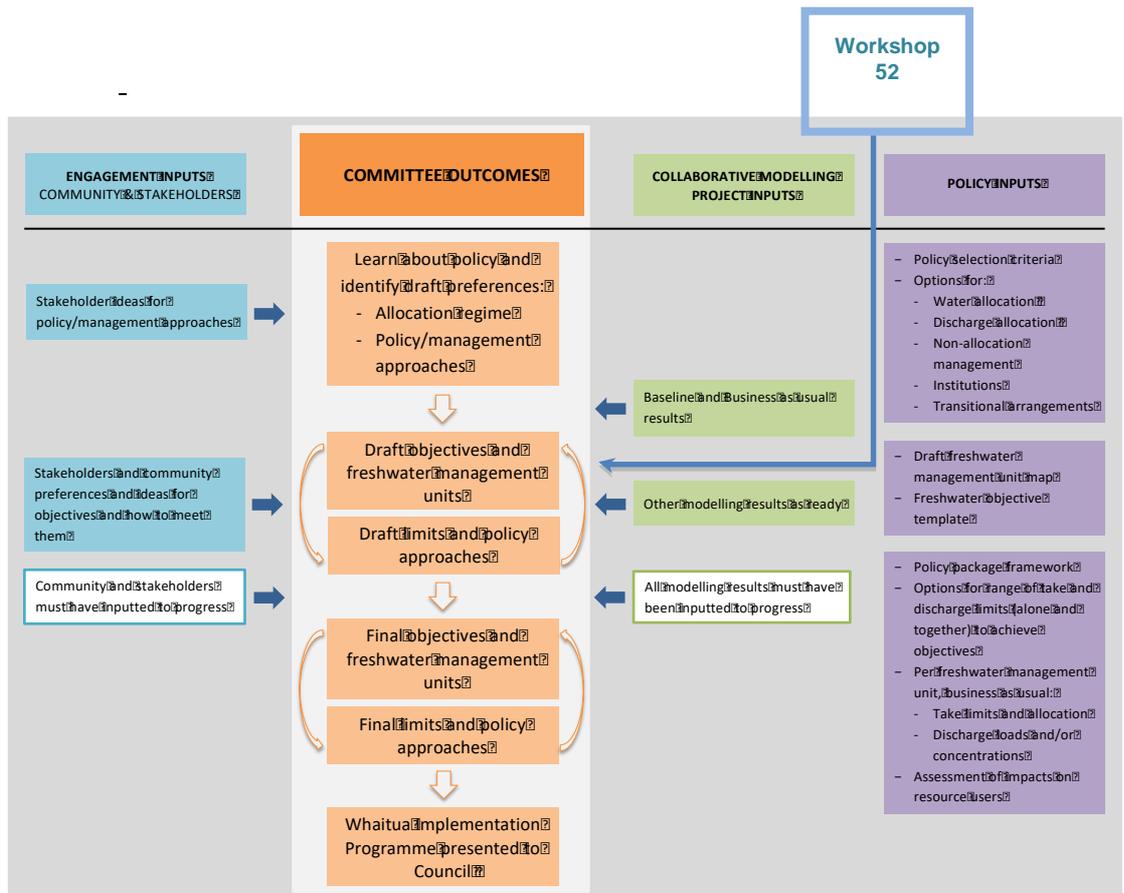


# Meeting Notes: Ruamāhanga Whaitua Committee

## Deliberations Phase 3 – Workshop 52

Monday 6 November 2017, 1:30PM - 6:00PM

Carterton Events Centre



**Summary** This report summarises notes from a workshop of the Ruamāhanga Whaitua Committee held from 1:30PM to 6:00PM on Monday 6 November 2017 at the Carterton Events Centre.

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**Contents** These notes contain the following:

- A** Workshop Attendees
- B** Workshop Purpose and Agenda
- C** Workshop Decisions
- D** Workshop Actions
- E** Workshop Notes – Lakes – Human health
- F** Workshop Notes – MCI and Periphyton

**Appendix 1:** Freshwater objective decisions for ecological health attributes (MCI and periphyton)

**Appendix 2:** Photos of Flipcharts

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## **A Workshop Attendees**

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**Workshop Attendees**

*RW Committee:* Aidan Bichan, Mike Birch, Esther Dijkstra, Andy Duncan, David Holmes, Peter Gawith, Russell Kawana, Chris Laidlaw, Colin Olds, Phil Palmer, Vanessa Tipoki, Mike Ashby.

*Greater Wellington Project Team:* Mike Grace, Horipo Rimene, Alastair Smaill, Natasha Tomic, Hayley Vujcich, Kat Banyard, Richard Parkes.

*Modellers:* John Bright, Mat Allen, Nick Taylor, Richard Storey.

*Independent Facilitator:* Michelle Rush.

*Apologies:* Rebecca Fox, Ra Smith.

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## **B Workshop Purpose and Agenda**

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**Purposes**

The purposes were:

1. Build an understanding of the modelling results for *E.coli* for the Lakes, and *periphyton*, *MCI* and *fish* in respect of the other Whaitua FMUs in relation to the future under each of the Business as Usual, Silver and Gold scenarios. Determine what these results have added to existing committee knowledge of the issues and

potential solutions.

2. Refresh aspects of RWC vision, long term outcomes and values to which ecological health (all FMU's) and *E.coli* (for the Lakes) is relevant.
3. Refresh understanding of the knowledge and perspectives relevant to ecological health in all FMU's, and *E.coli* (Lakes only) gained through:
  - a. mana whenua engagement; and
  - b. other community and stakeholder engagement
  - c. NPS-FM compulsory requirements under the NOF and relevant provisions of the PNRP; and
4. Taking all of this knowledge, develop freshwater objectives for each Freshwater Management Unit in the Ruamahanga Whaitua in respect of periphyton, MCI, fish and objectives for *E.coli* for the lakes.

Purposes 1-3 were achieved. Purpose 4 was achieved in part. Consensus was not reached for the Eastern Hill Rivers, Eastern Hill Streams and Aorangi River FMUs due to time constraints. Fish narrative objectives were also not developed for the same reason. Both of these matters were deferred to the next workshop.

**Agenda**

The agenda is detailed in the table below.

<b>Time</b>	<b>Task</b>
(1:30 – 1:40PM)	Welcome (Peter Gawith), Karakia (Ra Smith) and Purposes and Agenda (Michelle Rush)
(1:40 - 2:00)	<i>Presentation:</i> Modelling Results for <i>E coli</i> in the Wairarapa Lakes (Matt Allen)
(2:00 - 3:00PM)	<i>Workshop:</i> Developing freshwater objectives for human health for the Lakes (All)
(3:00 - 3:30PM)	Afternoon tea
(3:30 - 3:45PM)	<i>Presentation:</i> Modelling Results for ecological attributes - MCI, fish, periphyton (Richard Storey)
(3:45 - 5:50PM)	<i>Workshop:</i> Developing freshwater objectives for ecological attributes (All)
(5:50 – 6:00PM)	Reflection on process and looking forward to the next workshop

Time	Task
(6:00PM)	Meeting Close

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## C Committee Decisions

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### Committee Decisions

- The Committee reached a consensus on proposed freshwater objectives for MCI and periphyton for rivers in the following FMUs:
  - Northern Rivers, Ruamāhanga Main Stem, Valley Floor Streams, South Coast Streams, Western Hill Rivers.
- The Committee reached a consensus on proposed freshwater objectives for *E.coli* for Lake Wairarapa and Lake Onoke.

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## D Workshop Actions

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### Workshop Actions

The following actions were agreed to:

**Action:** Carry over reaching of consensus on MCI and periphyton for the Eastern Hill Rivers, Eastern Hill Streams and Aorangi River FMUs, and narrative objectives for fish in all FMUs to the following workshop.

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## E Workshop Notes – Lakes - Human Health

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### Overview - Setting human health objectives for the lakes

Mat Allen (University of Waikato) gave a presentation on the modelling done for *E.coli* in respect of Lakes Onoke and Lake Wairarapa. A summary report was also provided in advance of the workshop.

[Presentation on modelling E. coli in Lakes Onoke and Wairarapa](#)

[Summary report on E.coli modelling results in Lakes Onoke and Wairarapa](#)

[Table summary of E. coli baseline and modelling results](#)

Some key questions asked were:

Q: What monitoring information did we have about the barrage inflow?

A: We only had between 18 months and 2 years of data so we didn't have a lot of information.

Q: Does the model take into account the wind effect on Lake Wairarapa?

A: The 3D model took account of it.

Q: Can saltwater speed up *E.coli* mortality?

A: In Lake Onoke where it is tidal it's likely to speed up *E.coli* mortality but when you have high loads of *E.coli* in flooding situations it will dilute the water and there will be low salinity.

Q: How was the 1m depth change modelled?

A: It was modelled as an increase to the depth of 1m but the change could also come from dredging.

Q: The Lake Wairarapa levels are controlled by the water conservation order so can they be changed?

A: The water conservation order reflects the values that are used to set lake levels. The levels are then set informally by GWRC. There have been changes to lake levels in other parts of the country controlled by water conservation orders. How would that then affect the drainage scheme?

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**Overview -  
Setting human  
health  
objectives for  
the lakes**

Following the modelling output presentation Committee members then discussed this information, along with community engagement data relevant to human health in the lakes and where the lakes sit in the Proposed Natural Resources Plan.

The Committee members referred to the [document noting comments from engagement events to assist developing human health freshwater objectives](#) that was also provided at the previous workshop on 24 October 2017. They also referred to comments they had received at hui at marae over this process – in particular the high recreation values at Lake Onoke were noted.

Committee members also referred to [Schedule I and Schedule F](#) in the Proposed Natural Resources Plan.

They were asked to identify objectives (a suitable NOF band) for each that best provided for the seven values they have identified for the Ruamāhanga catchment, along with their vision and long term outcomes. The decisions they reached are set out in the next section.

[Example worksheet used to assist in developing lakes objectives](#)

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**Lakes Human Health Freshwater Objectives**

Consensus decisions were reached in respect of Lake Wairarapa Moana and Lake Onoke for the human health freshwater objective.

The decisions are:

**Lake Wairarapa Moana.**

- *NOF Band:* Maintain A band status for *E.coli* attribute
- *Reason:* The Lake is already at an A band and must be maintained. Important to stop the *E. coli* upstream in the rivers.

**Lake Onoke**

- *NOF Band:* Maintain B band status for *E.coli* attribute.
- *Note:* Revisit once modelling data is in for all other attributes: If an A band appears achievable at that stage, then change to 'Improve' to A Band.
- *Reason:* Lake Onoke is very important for fishing values. It also has high recreational values, and high mana whenua values. Anecdotal evidence suggests that the Lake's water quality does not make people unwell however.

**Other Measures**

- Give much greater focus to reducing loads in the upstream catchment.

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## F Workshop Notes – MCI & Periphyton

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**Overview - setting ecological health objectives for each FMU**

Alastair Smaill gave a brief overview of where periphyton and MCI sit in the National Policy Statement for Freshwater Management (NPS-FM) and talked about how you might set objectives for MCI, periphyton and fish. The link between fish objectives and mahinga kai was discussed, and the link between periphyton and recreation.

Hayley Vujcich briefly explained the summary table for periphyton and MCI.

[Summary table of periphyton baseline and modelling results](#)

[Summary table of MCI baseline and modelling results](#)

Richard Storey gave a presentation of the modelling results for MCI, periphyton and fish, three ecosystem health attributes that were modelled through the Bayesian Belief Network (BBN) modelling framework in respect of a range of future management scenarios. A summary report was also provided in advance of the workshop.

[Presentation on predictions of the bayesian network for periphyton, macroinvertebrates and fish](#)

[Summary of predicted outcomes from ecological bayesian network \(BN\)](#)

Q: Could you change the water temperature and therefore periphyton but having more groundwater input?

A: Groundwater is a lower temperature than surface water so it could help. Especially in the wide streams where it is hard to shade.

Q: What has the biggest effect on MCI?

A: Deposited fine silt would have the biggest effect. Concern from the Committee that silt is being deposited today in localised places in the river as a result of flood protection bulldozing. The potential effects of climate change have not been modelled. Acknowledged they would affect things like temperature and flow.

Q: What monitoring data is used for MCI?

A: The modelling data uses 3 years of monitoring data.

Q: Were flood protection works modelled in the BN?

A: No they weren't. One of the ways fish are affected is by the habitat in the river for them – the pools, riffles and runs. Flood protection works would affect these. The Committee would like the scenarios rerun with flood protection measures in the model.

Q: We've heard that the mitigation measures in the scenarios aren't giving a lot of change. Do we need to think of something more?

A: In this case more small streams weren't modelled but potentially this is an area where more changes could be made to bigger effect. E.g. shading of smaller streams. Most habitats for fish are in smaller streams.

Several comments were also made:

- Any removal of crack willow would need to be staggered so there wasn't a massive increase in water temperature while new planting grows.
- Water quality needs to be improved overall for mahinga kai. Iwi use the whole river to survive and for health reasons. We need to be thinking of improvement.

- We heard from the recent hui with mana whenua their unhappiness about the rivers being used as highways. We need different flood management.

Following this presentation, Committee members identified and discussed relevant information from community and mana whenua engagement, along with other data.

[Community engagement material - developing ecological health freshwater objectives](#)

They then worked in groups, taking one or more FMUs each, to identify objectives for each river in that FMU in respect of both MCI and periphyton, as they saw best meeting the values identified for the Ruamāhanga Whaitua, along with their vision and long term outcomes. An updated example values and objectives cascade was also considered.

[Example worksheet used to assist in developing freshwater objectives for ecological attributes](#)

[Updated example values and objectives cascade](#)

**Plenary discussion & consensus on MCI and periphyton freshwater objectives**

Consensus decisions were reached in respect of the Western Hill Rivers, Northern Rivers, Main Stem Ruamāhanga, Valley Floor Streams and South Coast Streams FMUs. These are detailed in the table in Appendix 1.

Plenary discussions:

Northern Rivers

- The modelling didn't show much improvement.
- We want improvement.
- Want to try the other methods talked about to see if that would get a change.
- AGREED FRESHWATER OBJECTIVES

Upper Ruamāhanga Main Stem

- Looking for improvement to an A band in the future. Agreed the timeframe was by 2040 for periphyton.
- Some discussion that periphyton wouldn't be the difference between people deciding to swim in an area or not.
- There are high values (trout, mahinga kai, migrating fish etc.) in the Ruamāhanga main stem so looking for improvements to MCI.
- Aware they are ambitious freshwater objectives but potentially could be achieved with good work in the tributaries.

- **AGREED FRESHWATER OBJECTIVES**

#### Western Hill Rivers

- Question about whether MCI in the Mangatarere is in the C band. Committee experience is that it's better so consider achieving an A band is possible. It is the most important trout spawning area in the Wairarapa. Agreed to improve to B by 2040 and A by 2080.
- Waipoua – it is quite a narrow river so should be able to get a shift from B to A band for periphyton with shading. Will revisit once we get the economic impact information.
- Waingawa – some discussion about why only maintaining at the B band for periphyton? Fishing is very poor downstream and the draw off from the river is high. It's important because it feeds into the Upper Ruamāhanga. Hard to make a shift.
- Waipoua – want to move to the A band for MCI as it's already been identified as a special river by the Committee. Are we being optimistic? It suffers from low flows as it's a foot hills river. Agreed to move to the B band.
- **AGREED FRESHWATER OBJECTIVES**

#### Valley Floor Streams

- Otukura Stream – looking to maintain as it flows in Lake Wairarapa which as a receiving environment has less periphyton issues.
- **AGREED FRESHWATER OBJECTIVES**

#### South Coast Streams

- Looking to maintain as they're likely to be good streams for these attributes already.
- **AGREED FRESHWATER OBJECTIVES**

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#### **Next steps**

It was agreed to complete work on the Eastern Hill Rivers, the Eastern Hill Streams and the Aorangi Rivers FMUs at the next workshop.

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## Appendix 1: Freshwater objective decisions for ecological health attributes (MCI and periphyton)

 = Consensus not reached on these rivers

River	FMU:	Current to Recommended NOF Band: <b>MCI</b>	Reason why (with respect to RW values)	Current to Recommended NOF Band: <b>Periphyton</b>	Reason why (with respect to RW values)	Other Measures for <i>Periphyton and MCI</i>
<b>Western Hill Rivers FMU</b>						
Waiohine	Western	C to B (Improve)	Need further investigation Flood management	A to A (Maintain)	Already at A - must maintain it there.	
Waipoua	Western	C to B (Improve)	Further investigation on the potential for improvement - what could get it to A band?	B to A by 2040 (Improve)	Further research required - smaller streams management	
Upper Ruamahanga	Western	C to B (Improve)	Further research / investigation required	A to A (Maintain)	Already at A - must maintain it there.	
Mangatarere	Western	C to A (Improve to B by 2040 and A by 2080)	A big improvement should be possible with improvements in waste water treatment under way, declining industrial usage, riparian planting programmes on first and second order streams	C to A (Improve long term by 2040)	A big improvement should be possible with improvements in waste water treatment under way, declining industrial usage, riparian planting programmes on first and second order streams	

Waingawa	Western	B to B (Maintain)	Already at A and must maintain	A to A (Maintain)	At a reasonable level	
Tauherenikau	Western	C to B (Improve)	Check existing state	A to A (Maintain)	Already at A - must maintain it there.	
<b>Eastern Hill Rivers FMU</b>						
Taueru River	Eastern Hills	Good to Good (Maintain)	Formerly used for recreation. High mahinga kai values. Lack flushing flows.	D to C (Improve)	Must improve.	More monitoring sites than one are needed on sub-catchment to help take community on a journey - citizen science opportunities. Riparian planting is needed - inconsistent within catchment. Needs <u>scale</u> of community groups. Re-clothing the hill country is a must. Farm plans need greater reach. Careful management of removal of willows.
Huangularua River	Eastern Hills	Fair to Good (Improve)	Think improvement is possible with hill country management. Lots of willows - if removed then we need good transitional management to try and replace shade on stream.	C to B (Improve)	Shift shown in modelling. Concerned about low flows in the catchment.	Retirement and erosion protection is important here. All farmers on farm plan. Riparian planting! Concern about potential impact from urban take (Martinborough). Investigate restrictions at minimum flow - need better flow monitoring and investigation and enforcement. Options for

						river management to control cross blading.
Makahakaha Stream	Eastern Hills	Fair to Fair (Maintain)		Maybe C (based on other EHR grade) to C? (so little information) - Maintain?	Some shading of stream but reduced as willows have ben removed - but no shading in upper catchment. Riparian planting could have a big impact. A smallish catchment. Spring feed so fair flow - small feeder streams likely below accord size. Pā tuna, significant mana whenua values including being close to a Marae. Limestone catchment in two-thirds of the catchment. Unclear how much shading will cool the water.	Riparian planting on stream and tributaries likely to be important here. Need further information to really know options including to see what opportunities there are to decrease water temperature. Signal to community to get to B if possible. This is Andrew Stewart's catchment!

### South Coast Streams FMU

South coast streams		Unknown to Unknown (Maintain. Or improve to Fair if necessary. May be one stream in this category)		Unknown to Unknown. (Maintain. Unlikely to have a periphyton problem because of substrate and low nutrient load)		
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## Eastern Hill Streams FMU

??	Eastern Hills Streams	?? to ?? (Maintain)	Small, dry up, only two bridges in the area and one river is called Dry River... act as flood flow paths. Some intensive farming with good soils between road and river, but very dry on other side. Enthusiastic community - should leverage this. Catchment has lowest recorded average rainfall for the whole of the North Island.	?? to ?? (Maintain)	Small, dry up, only two bridges in the area and one river is called Dry River... act as flood flow paths. Some intensive farming with good soils between road and river, but very dry on other side. Enthusiastic community - should leverage this. Catchment has lowest recorded average rainfall for the whole of the North Island.	
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## Aorangi Rivers FMU

Tauanui	Aorangi Rivers	Fair to Good (Improve)	MCI - Seeks stock exclusion higher up the catchment. Category A restrictions at minimum flows.	C/D to B (Improve)	Significant biodiversity values. Low flows, including as dries up naturally. Inesntive land use (beef feed lot). Lots of drainage of catchment. Deforesting of upper catchment of pines. Cyanobacteria issues-can't walk dogs. Small catchment and only a few intensive land uses so change is	
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					possible, e.g. through farm plans. Right by lake - important for migrating fish.	
Turanganui	Aorangi Rivers	Fair to Good (Improve)	MCI - Farm plans, stock exclusion, category A restrictions at minimum flow	D/C to B (Improve)	Significant indigenous biodiversity including for fish - first stop for fish on their way up river. Intensive land use and stock access. Animals are regularly crossing the river. Some good mitigation in the catchment.	

### Northern Rivers FMU

Kopuaranga	Northern	C to B (Improve)	Want to improve the situation as its poor quality.	D to C (Improve)	Must improve.	MCI - need other methods that reduce deposited silt.
Whangaehu	Northern	C to B (Improve)	Want to improve as its poor quality.	D to C (Improve)	Must improve. No data so matched with Taueru results as they're similar rivers. Want to improve but think it will be hard to achieve.	Retiring worst land - already in modelled scenarios? Planting poplars and willows - bank stabilisation Periphyton - focus on dissolved nutrients - other measures on top of mitigations in scenarios. Shading on smaller streams - take a coordinated approach. Planting poplars and willows. Gross feeders to help reduce nutrients.

<b>Valley Floor FMU</b>						
Parkvale	Valley Floor Streams	Fair to Good (Improve)	Responding to community desires to improve Parkvale Stream	B to B (Maintain)	Good enough! Measures taken to reduce nutrient concentrations (next week's objective setting) may improve periphyton grade. Rather focus is on N and P objectives.	
Otukura	Valley Floor Streams	Fair to Fair (Maintain)		Unknown to Unknown (Maintain)	It is unlikely to support periphyton - macrophytes are more likely to dominate.	
<b>Main Stem Ruamāhanga FMU</b>						
Ruamāhanga at Waihenga	Main Stem Ruamāhanga	C to B (Improve)	Want to improve for mahinga kai, trout fishing, food for migrating fish and natural character.	B to B (Maintain) (Want to improve to A in long term - 2040)	Recreation area. Very hard to make change. Reduction in nutrients into river and from tributaries is needed to achieve improvement.	MCI - Change flood management practices and bulldozing in main steam. Create pools, riffles etc. Create habitat and natural character.
Ruamāhanga at Pukio	Main Stem Ruamāhanga	B to B (Maintain)	Want to maintain for mahinga kai, trout fishing, food for migrating fish and natural character.	B to B (Maintain) (Want to improve to A in long term - 2040)	Recreation area. Very hard to make change. Reduction in nutrients into river and from tributaries is needed to achieve improvement.	
Ruamāhanga at Gladstone	Main Stem Ruamahanga	C to B (Improve)	Want to improve for mahinga kai, trout fishing, food for migrating fish and	B to B (Maintain) (Want to improve to A in long term - 2040)	Recreation area. Very hard to make change. Reduction in nutrients	

			natural character.		into river and from tributaries is needed to achieve improvement.	
Ruamāhanga at Wardells	Main Stem Ruamahanga	C to B (Improve)	Want to improve for mahinga kai, trout fishing, food for migrating fish and natural character.	B to B (Maintain) (Want to improve to A in long term - 2040)	Recreation area. Very hard to make change. Reduction in nutrients into river and from tributaries is needed to achieve improvement.	
Ruamāhanga at Lake Wairarapa outlet	Main Stem Ruamahanga	C to B (Improve)	Want to improve for mahinga kai, trout fishing, food for migrating fish and natural character.	Unkown to Unknown (Improve Long term - 2040)		

# Appendix 2: Photos of flip charts

o Stop the e coli upstream  
 o e coli worse in the river  
 o " silty in A Band in lakes - other problems to deal with

RWC Lake Waikarepa  
 Agreed: A Band 😊

maintain already here!  
 😊

Lake Onoke

Onoke (B or B+) - If it stays in the B or B+ category for the parameter

Consequence  
 B - revisit once we have heard other lake parameter results - if it stacks up - could shift to an "A"

**EASTERN HILL RIVERS**

**EASTERN HILL STREAMS**

**PORANGI RIVERS**

**SOUTH COAST STREAMS**

Detailed handwritten notes on flip charts for various river and stream catchments, including water quality parameters and management actions.

**VALLEY FLOOR STREAMS**

<b>MCI</b> RIVER: Parkvale NOF BAND NOW: Fair REASON (Link to RW values): Responding to community desires to improve Parkvale Stream. ✓	<b>Valley Floor Stream</b> FMU: Valley Floor Stream NOF BAND FUTURE: Good	<b>Periphyton</b> RIVER: Parkvale. NOF BAND NOW: B. REASON (Link to RW values): Good enough! Measures taken to reduce nutrient concentrations (next weeks objectives) may improve periphyton grade. Rather focus on N = P obj. ✓	<b>Valley Floor</b> FMU: Valley Floor. NOF BAND FUTURE: B
<b>MCI</b> RIVER: Otukura. NOF BAND NOW: Fair. REASON (Link to RW values):	<b>Valley Floor</b> FMU: Valley Floor NOF BAND FUTURE: Fair (Maintain). ✓	<b>Periphyton</b> RIVER: Otukura. NOF BAND NOW: Unknown. REASON (Link to RW values): Unlikely to support periphyton - macrophytes more likely to dominate. ✓	<b>Valley Floor</b> FMU: Valley Floor. NOF BAND FUTURE: Maintain.
<b>MCI</b> RIVER: Sth Coast Streams NOF BAND NOW: Unknown. REASON (Link to RW values):	<b>Valley Floor</b> FMU: Valley Floor NOF BAND FUTURE: Maintain or Improve to Fair if necessary. (maybe in this category). ✓	<b>Periphyton</b> RIVER: Coastal Streams. NOF BAND NOW: Unknown. REASON (Link to RW values): Unlikely to have periphyton problem because of substrate, low nutrient content load. ✓	<b>Valley Floor</b> FMU: Valley Floor. NOF BAND FUTURE: Maintain. ✓

**MAIN STEM  
RUAMAHANGA**

<p><b>MCI</b> RIVER: AT GLADSTONE NOF BAND NOW: C REASON (Link to RW values) SAME AS OTHERS</p>	<p><b>PER</b> RIVER: AT GLADSTONE NOF BAND NOW: B REASON (Link to RW values) Recreation area Very hard to make change Reduction in nutrients into river and from tributaries to achieve A.</p>
<p><b>MCI</b> RIVER: AT WARDDELLS NOF BAND NOW: C REASON (Link to RW values) WANT TO IMPROVE MAHINGA MAI TROUT FISHING FOOD MIGRATING FISH FOR</p>	<p><b>PER</b> RIVER: AT WARDDELLS NOF BAND NOW: B REASON (Link to RW values) Recreation area Very hard to make change Reduction in nutrients into river and from tributaries.</p>
<p><b>MCI</b> RIVER: RUAM + WAHANGA NOF BAND NOW: C REASON (Link to RW values) SAME AS OTHERS</p>	<p><b>PER</b> RIVER: RUAM AT WAHANGA NOF BAND NOW: B REASON (Link to RW values) Same as at Gladstone</p>
<p><b>MCI</b> RIVER: LAKE WAI OUTLET NOF BAND NOW: C REASON (Link to RW values) SAME AS OTHERS</p>	<p><b>PER</b> RIVER: LAKE WAI OUTLET NOF BAND NOW: ? REASON (Link to RW values) Improvement</p>
<p><b>MCI</b> RIVER: AT PUKIO NOF BAND NOW: B? REASON (Link to RW values) SAME AS OTHERS</p>	<p><b>PER</b> RIVER: AT PUKIO NOF BAND NOW: B REASON (Link to RW values) Same as at Gladstone</p>

**OTHER METHODS TO IMPROVE MCI:**  
Change flood practices and bulldozing in main stem. Create pools, riffles etc. Habitat and natural character.

**NORTHERN RIVERS**

<p><b>MCI</b> RIVER: KOPUARANGA NOF BAND NOW: C REASON (Link to RW values) Want to improve due to poor quality</p>	<p><b>PERIPHYTEON</b> RIVER: KOPUARANGA NOF BAND NOW: D REASON (Link to RW values)</p>
<p><b>MCI</b> RIVER: WHANGAHEHU NOF BAND NOW: C REASON (Link to RW values) Want to improve</p>	<p><b>PERIPHYTEON</b> RIVER: WHANGAHEHU NOF BAND NOW: D REASON (Link to RW values) No data. Match with Taueru. Similar rivers Want improvement. Think will be hard.</p>

**Other methods:** MCI WHANGAHEHU + Kop  
Other methods that reduce deposited silt. Retiring worst land - already in modelling?  
Planting poplars + willows - bank stabilisation [gross feeders to reduce nutrients - help periphyton]

**Other measures:** WHANGAHEHU + Kop  
(periphyton)  
Focus on dissolved nutrients - other measures on top of mitigations in scenarios.  
Shading on smaller streams  
Co-ordinated approach

WESTERN HILL RIVERS

<p>RIVER: Waingawa NOF BAND NOW: A REASON (Link to RW values) Maintain</p> <p>Per FMU: W.H. NOF BAND FUTURE: ✓</p>	<p>RIVER: Waingawa NOF BAND NOW: B REASON (Link to RW values) Maintain</p> <p>MCI FMU: W.H. NOF BAND FUTURE: ✓</p>
<p>RIVER: Mangatere NOF BAND NOW: C REASON (Link to RW values) Waste water treatment - declining industrial usage - riparian planting - 1st, 2nd order streams.</p> <p>Per FMU: Western Hills NOF BAND FUTURE: A By 2040</p>	<p>RIVER: Mangatere NOF BAND NOW: C REASON (Link to RW values) Waste water treatment - riparian planting - 1st, 2nd order</p> <p>MCI FMU: W.H. NOF BAND FUTURE: A 2040 B 2040</p>
<p>RIVER: Taehonika NOF BAND NOW: A REASON (Link to RW values) Maintain</p> <p>Per FMU: W.H. NOF BAND FUTURE: ✓</p>	<p>RIVER: Taehonika NOF BAND NOW: C REASON (Link to RW values) Check status.</p> <p>MCI FMU: W.H. NOF BAND FUTURE: B ✓</p>
<p>RIVER: Waiohine NOF BAND NOW: A REASON (Link to RW values) Maintain</p> <p>Per FMU: W.H. NOF BAND FUTURE: ✓</p>	<p>RIVER: Waiohine NOF BAND NOW: C REASON (Link to RW values) * Further investigation * Flood Management</p> <p>MCI FMU: W.H. NOF BAND FUTURE: B ✓</p>
<p>RIVER: Upper Ruanui NOF BAND NOW: A REASON (Link to RW values) Maintain - seek information beyond modeling scenarios</p> <p>Per FMU: W.H. NOF BAND FUTURE: ✓</p>	<p>RIVER: Upper Ruanui NOF BAND NOW: C REASON (Link to RW values) Further research/investigation required</p> <p>MCI FMU: W.H. NOF BAND FUTURE: B ✓</p>
<p>RIVER: Waipia NOF BAND NOW: B REASON (Link to RW values) Further research required - smaller streams rampant</p> <p>Per 2040 FMU: W.H. NOF BAND FUTURE: A</p>	<p>RIVER: Waipia NOF BAND NOW: C REASON (Link to RW values) Further investigation - potential for improvement - ? A band.</p> <p>MCI FMU: W.H. NOF BAND FUTURE: A/B</p>

ENDS