Proposed Plan Change 10
to the BoP Regional Water & Land Plan
(Lake Rotorua Nutrient Management)

Elizabeth McGruddy, Federated Farmers, April 2017

Outline

- Recap process
- Recap context
- Reasons
- Recommendations
- Relief sought

Recap Process

Why did agreements come unstuck at such a late stage?

FFNZ Pg 49-53

- OR…why were disagreements and alternatives not discussed and resolved at an earlier stage?

- FFNZ/Collective submission on draft s32 in 2015
  - science has shifted
  - science review first, plan review second
  - do the job once and do it well
  - continue action-on-the-ground

- FFNZ/Collective submission not included in PPC10 s32
  - s32 does not properly identify/assess all options

Recap Context

The importance of context

MfE, 2014: Guide to Section 32 Reports, FFNZ Pg 24-5

"The degree of clarity about the problem

will influence the type and range of policy solutions, and the quality of analysis of the options"

Science has shifted

FFNZ Pg 25-34

- PPC10 predicated on assumption that achieving RWLP TLI is principally about N, principally N leaching from farms
  - with assumption of zero attenuation from farm to lake

- Significant shifts in understanding of lake nutrient dynamics
  - significance of internal bed nutrients
  - potential shift to P-limitation
  - importance of flood flow particulate nutrients
  - catchment average N attenuation now estimated 42%

- This wider “whole system” context is material to PPC10
  - need to check and test implications of this new understanding of lake complexities

Implications of the new science?

FFNZ Pg 47-51

- Expanded system understanding opens up an expanded portfolio of options for delivering the result for the lake
  - N & P
  - baseflow & flood flow
  - source & transport & sink

- The new science highlights strong sub-catchment patterns
  - PPC10 relies on whole of catchment aggregates and averages
  - the more fine-grained sub-catchment information now available enables interventions targetted to the specific context

- The expanded portfolio, supported by more fine-grained understanding of spatial-temporal patterns, allows us to prioritise best-bang-for-buck options

Are we making progress?

- PPC10 acknowledges urban investments & progress

- PPC10 does not make any similar acknowledgement for the farming sector. Notwithstanding this omission, evidence has been presented of sustained and significant investments by farmers, individually and collectively

- Data provided for the Economics Caucus indicates significant progress beyond Rule 11 benchmarks towards the 2022 catchment target
  - dairy: two-thirds achieving 2022 target (sample 21 farms)
  - drystock >40ha: three-quarters achieving 2022 (sample 20 farms)
  - drystock <40ha: two-thirds achieving 2022 (sample 14 farms)
  - if sample representative, then three-quarters achieving 2022 target

- The key ongoing challenge for the lake community is legacy loads
  - bed nutrients (including from urban sewage discharges)
  - groundwater N (including from conversion to farming)

Legacy Loads

FFNZ pg 35-36

- Post-WWII, Government actively supported maximising agricultural output (livestock incentives, fertiliser incentives, land development)

- In 2004, BoPRC commissioned work (*MDL, Government Funding of Rotorua Lakes Restoration)* which recorded that:

  - from 1944-1980, Rotorua Branch of Department of Lands & Survey settled 10,500ha in 1,000 farms (700 dairy, 300 sheep)

- MDL concluded that applying the “polluter pays” principle in Rotorua would offend against the general legal principle that people should not be held accountable for the costs of action which were lawful, and indeed encouraged by Government.

Testing PPC10 against the new (wider) context

FFNZ Pg 3-8

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- This hearing is the first formal , public opportunity to test PPC10

- PPC10 is a flawed and risky approach to achieving the results we all want
  - It is out of step with the science
  - It does not appropriately acknowledge the significance of legacy loads, including in-lake nutrient loads
  - It fails to acknowledge and document progress made, both urban and rural
  - It would come at un-necessary and irreversible cost to the Rotorua farming economy
  - It compromises efficient investment of the Incentives Fund
  - It risks undermining social capital, forcing people to “fight their corner” when the real opportunity is to unite behind shared goals

- PPC10 is not the most efficient and effective way forward for the lake, or for the lake community

Reasons

Loads and Uncertainties

MfE Guide to Freshwater accounting (FFNZ Annex P)

- *"It is important that stakeholders understand the uncertainty associated with load estimates, particularly in setting limits".*
- *"This uncertainty should be explicitly stated".*
- *"Examine the implications for management decision".*
- *"In high priority FMUs, it may be necessary to reduce the uncertainties to provide the necessary confidence in the outcomes of decisions".*

Do we have a solid coherent platform of load estimates?

FFNZ Pg 27-32

- No

- N load estimates rely on a pot pourri of historic and recent reports
  - every document has a different set of numbers
  - some are in the ballpark, others appear markedly different
  - some numbers are not stated but can only be inferred
  - some are referenced, others present no supporting evidence
  - some list most contributing sources, others present only some
  - many compare apples with pears

- We all need to be clear: <u>what are the loads, what are the targets, who has got what, and what will PPC10 deliver</u>? (on one sheet of paper)

What is the current N load to the lake?

- ROTAN-Annual (*inferred from fig 3-10, pg 41*) indicates current catchment load around **570t**

  - based on calibrating estimated catchment loads to observed stream concentrations (not including flood flows?)

- NIWA 2009 *(FFNZ Annex I)* estimated stream N loads at around **437t**

  - based on data 1992-2005, including flood flow loads

  - but not including minor/ungauged streams (which ROTAN includes)

- The difference is around **130t**

- What accounts for the difference?

  - the difference might be minor/ungauged streams?

  - provision of ROTAN sub-catchment stream estimates would help illuminate any reasons for the apparent difference

  (requested from Council)

What is the difference between current load and "steady state"?

GNS, 2006, Prediction of Future N Loading to Lake Rotorua

- ROTAN-Annual indicates current load around 570t
  - but "steady state" load is estimated around 750t
  - the difference is around **180t** (legacy N load-to-come)

- Estimates of the N load-to-come were made by GNS in 2006
  - samples from shallow (recent) and deep (older) bores were compared, then extrapolated to derive catchment average LTC
  - the catchment estimate is around **200t** (of varying ages)
  - half is Hamurama (65t) and Awahou (35t)
  - Ngongotaha, Waiohewa and Waiowhiro may already be at "steady state" (ie, little further increase in legacy N loading)

- In 2009, NIWA noted (*N Exports – calibration of the ROTAN model, pg 53)*
  - "Predicted N concentrations in Hamurama and Awahou are very sensitive to uncertainties"

Do we have more recent data on groundwater N to inform load estimates

FFNZ Statement, pg 23

- No. BoPRC do not have a network of regularly monitored bores
  - one bore was monitored 1997-2009 (annual samples)
  - one bore was monitored 2003-2008 (annual samples)
  - no bores were monitored 2009-2015
  - from 2016, 3 bores will be monitored (quarterly samples)

- The ROTAN-Annual report (*pg 20)* noted
  - "there are very limited data on groundwater concentrations from which to make a priori estimates of slowflow attenuation"

- Acknowledging data gaps, any uncertainties in modelled estimates should be explicitly tabled, and should be in scope for the Science Review, eg:
  - review LTC estimates, especially Hamurama and Awahou
  - assess the need for more monitoring bores

What is the pastoral contribution to N loads to the lake?

FFNZ Pg 22

- ROTAN 2011 (*Table 6, pg 40)* estimated pastoral rootzone losses (dairy 5,000 ha, drystock 15,000 ha) at around **500t**
  - together with other sources (forestry, urban, geothermal), the estimated total catchment load of direct discharges and rootzone losses (725t) broadly matched observed stream concentrations
  - if no attenuation assumed

- ROTAN-Annual (*inferred from Table 3-9, pg 40*) now estimates pastoral rootzone losses at nearly **1,000t,** implying a combined total load from land **>1,200t**
  - ie, significantly greater than the observed stream load
  - the difference is assumed attenuation (average 42%)

- In effect, ROTAN-Annual scales pastoral losses up by nearly double (88%) and then down by nearly half (42%) to arrive back at an estimate of pastoral losses somewhere around the original **500t** (within the re-estimated total load of around 750t)
  - in order to broadly match the observed stream concentrations

What is the pastoral load reduction target?

FFNZ, pg 59-60

- ROTAN-Annual (*table 3-9, pg 40*) presents reduction targets from PPC10
  - the pastoral load reduction target under Overseer v5 was **140t**
  - Under Overseer v6, it has been scaled up by 88% to **263t**

- The difference is more than **120t**
  - the same "proportional reduction" formula has been applied
  - but the same proportion of a bigger number, is a bigger number

- The expensive end of the cost abatement curve is the last 100t
  - this "extra" 100t is not real, but an artefact of the methodology
  - the catchment target was scaled up (by 88%) , then down(by 42%)
  - the pastoral portion of the target was only scaled up
  - the pastoral sector is being asked to "over-deliver" by over 100t

What are the sub-sector loads and targets?

- ROTAN-2011 (*Table 2, pg 19 and Table 6, pg 40*) presents aggregate estimates for:
  - dairy: 5000ha, estimated N rootzone losses 273t
  - drystock: 15,000ha, estimated N rootzone losses 236t
  - total pastoral: **20,000ha, 500t** (*rounded)*

- Clarification is required on the portions of this aggregate which are:
  - >40 ha properties vs <40ha properties (small blocks 5,600 ha)
  - whole farm area vs "effective" farm area
  - rootzone leaching estimates vs overland flow nutrient losses

What are the load reduction targets for other sources and sectors?

- To answer the question, we need to identify all other sources and sectors (in NPS-FW terms, the "freshwater accounting" step)
  - ROTAN 2011 (Table 6) presents a list of sources and loads (not including gorse, estimated 30t from 870ha – s32, pg 7)
  - ROTAN-Annual does not re-present or update sources/loads (except to quantify "agreed" PPC10 reductions in Table 3-9)

- PPC10 provides a framework which assumes (ROTAN-Annual, Table 3-9)
  - reductions from the "rules and incentives" (451t) and gorse (30t)
  - no reductions from forestry (albeit loads differ from ROTAN?)
  - reduction from septic tanks (10t), no reduction from lifestyle
  - reduction in urban load (17.5t), increase from the WWTP (30t)
  - reduction in Tikitere geothermal (22.5t)
  - net reduction **500t**

What will PPC10 deliver?

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- The RPS target load is **405t**

- The estimated current N load to the lake is around **570t**
  - PPC10 is designed to deliver reductions of **500t**
  - apparently leaving a balance of just **70t**

- These numbers do not add
  - the key issue appears to be the scaling of the attenuation factor

- Going forward, the upcoming Rotorua Lakes WMA should be informed by both the Science Review (re-assessing N/P targets) and by appropriately detailed freshwater accounting

- <u>At this time, the base information is not sufficiently certain or explicit to support an informed discussion or decision on allocation, or to support a trading regime</u>

Improving base information - immediate and ongoing

- Improving base data to support models

  - *In NZ, a lot of money is being invested in modelling, assumptions are getting larger and larger; models depend on the quality and quantity of underpinning data (G Doole, Day 2)*

- Modelling work in progress

  - UoW: re-programming of ROTAN-v2 (ROTAN-Annual, pg 8)

  - GNS: groundwater model

- Need to table the numbers behind the summaries, graphs, pie-charts

  - ROTAN-Annual: provide the sub-catchment estimates (rootzone losses, assumed attenuation factor, observed stream load estimates)

  - Council Memorandum, Appendix 11, graph: quantify current pastoral load estimates relative to benchmarks and 2022 target

Recommendations

Engaging catchment communities

MfE, 2015, A Guide to the NPS-FW (FFNZ Annex N)

- *"Community-led initiatives and collaboration between communities, local authorities and iwi will be important in improving freshwater management"*

- *"A mix of approaches can be tailored to the individual catchment and can be targetted to local issues, interests and parties"*

- *"The social, economic, cultural and environmental impacts of a particular approach (or combination of approaches) should be evaluated and considered. This means that working collaboratively with relevant water users is important in setting targets, timeframes and methods at a catchment level"*

Integrated Catchment Management

FFNZ, pg 37

- RPS: "*Taking a whole of catchment approach is promoted. It means considering the full mix of purposes, uses and activities within a catchment, in terms of how these interact and contribute to outcomes.*

- *This approach suggests a need to work with multiple parties to establish shared objectives for a catchment.*

- *The achievement of sustainable management will require integrated management…and flexibility to allow for technological advancement and human ingenuity.*

- *It also requires taking a non-regulatory approach to achieve desired outcomes"*

Working with farmers

FFNZ, pg 37

- Oturoa Agreement: *"The parties agree that the Collective, with the support of BoPRC, and in collaboration with industry research organisations, will work with farmers to develop individual farm plans and collective solutions, to meet nutrient reduction targets"*

People and Partnerships

- *"Catchment management groups, socially and culturally sophisticated approach, local learning, community capacity building"*
  (Rotorua Ratepayers)

- *"Working the land builds the relationship with the land. Co-design, partnership. It's not the fast way or the easy way, it's the right way" (Waiteti Trust)*

- *"Break the lake into sub-catchments, adds up to the whole lake. Project Rerewhakaaitu – scientists come to the hall, farmers learn. Being part of the process, take ownership of the outcome. Initially only 40% uptake but with Bob Parker and AgResearch, now got 100% uptake" (Chris Sutton)*

- *" Sub-catchment/landcare groups – everyone feels empowered to do their bit, lifts spirit, whole community buy-in. Framework that inspires confidence, include flexibility for real world responses, creative and efficient ways of achieving better outcomes" (Sharon Morrell)*

ICM – NZ experience

- Network of ICM projects around NZ
  - three-way funding partnership: government, regional councils, landowners/industry/community
  - examples: Aorere, Pomahaka, Wairarapa Moana

- Local experience
  - Project Rerewhakaaitu
  - SFF projects, eg, Detainment Bund project

- Key success factors
  - coordination
  - funding , eg, for fieldays, visiting scientists, supporting trials
  - catchment specific information, eg, LIDAR, plus local knowledge
  - catchment specific monitoring

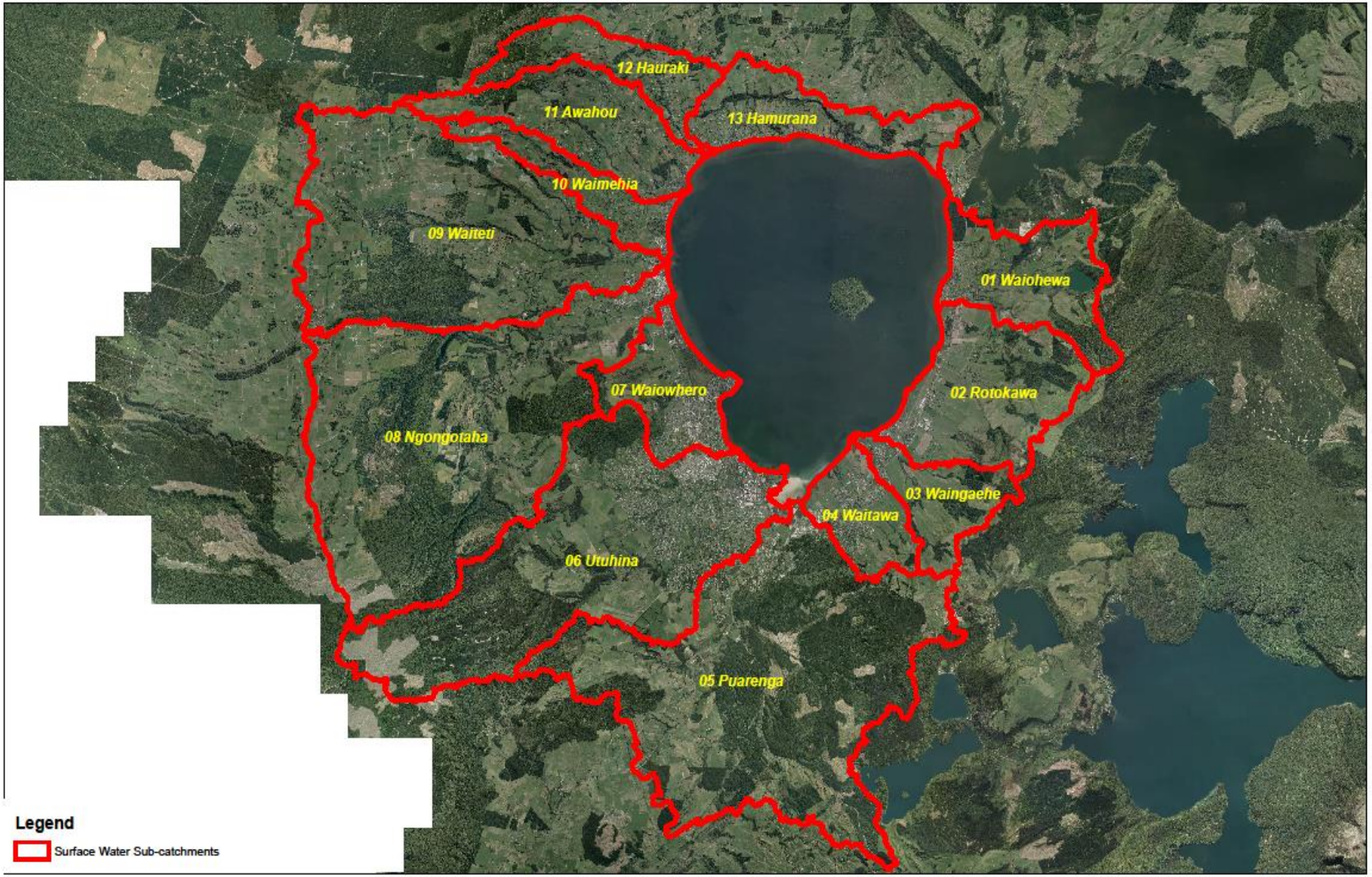
Working at sub-catchment scale

FFNZ, pg 31

- A key new element in the FFNZ recommended approach is the development of sub-catchment action plans

- In 2003, MfE commissioned a report considering options for Lake Rotorua (Dr Bruce Hamilton,2003. The report recommended:

  - "*building simple sub-catchment models that can be used to work with landowners to show how they contribute to nutrient reductions across the catchment, and how their management efforts are working*"



Lake Rotorua Surface Water Sub-catchments

Scale 1:115,672

1,000 0 1,000 2,000 3,000 4,000 5,000

Metres

Sheet 1 of 1

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Sub-catchment	Baseflow (age)	TIN Load t/pa		Flood flow (% total flow)	Part.. N Load (% total load)		TN Load t/pa	IndicativeMRT
Hamurama 15 km2	2468 L/s (110 yo)	55		26 L/s 1%	5 8%		60	30
Awahou 20 km2	1468 L/s (61 yo)	61		127 L/s 8%	5 8%		66	30
Puarenga 80 km2	1099 L/s (37 yo)	63		612 L/s 36%	16 20%		79	35
Utuhina 60 km2	1162 L/s (48 yo)	42		683 L/s 37%	16 28%		58	25
Waiowhiro 15 km2	255 L/s (42 yo)	11		103 L/s 29%	2 15%		13	5
Ngongotaha 80 km2	963 L/s (16 yo)	44		771 L/s 44%	24 35%		68	30
Waitete 60 km2	788 L/s (40 yo)	47		368 L/s 32%	3 6%		50	25
Waiohewa 10 km2	207 L/s (40 yo)	28		112 L/s 35%	4 13%		32	15
Waingaehe 10 km2	209 L/s (127 yo)	10		19 L/s 8%	1 9%		11	5
Minor streams 70 km2								
Catchment 500 km2	8619 L/s	361 83%		2821 L/s 25%	76 17%		437 t	200 t

Sub-catchment	Baseflow (age)	DRP Load		Flood flow (% total flow)	Part.. P Load (% total load)		TP Load	Indicative MRT
Hamurama 15 km2	2468 L/s (110 yo)	6.28		26 L/s 1%	0.88 12%		7.16	1
Awahou 20 km2	1468 L/s (61 yo)	3.56		127 L/s 8%	0.51 13%		4.07	1
Puarenga 80 km2	1099 L/s (37 yo)	2.26		612 36%	4.72 68%		6.98	2
Utuhina 60 km2	1162 L/s (48 yo)	3.13		683 37%	2.82 47%		5.95	2
Waiowhiro 15 km2	255 L/s (42 yo)	0.33		103 29%	0.5 60%		0.83	
Ngongotaha 80 km2	963 L/s (16 yo)	1.39		771 44%	2.74 66%		4.13	2
Waitete 60 km2	788 L/s (40 yo)	1.3		368 32%	1.25 49%		2.55	0.5
Waiohewa 10 km2	207 L/s (40 yo)	0.21		112 35%	0.97 82%		1.18	0.5
Waingaehe 10 km2	209 L/s (127 yo)	0.77		19 8%	0.24 24%		1.01	
Minor streams 70 km2		7.11			6.33 47%		13.44	2
Catchment 500 km2	8619 L/s	26t 55%		2821 l/s 25%	21t 45%		47t	35t

Sub-catchment	Farms Lifestyle Urban	Nutrient Load TN, TP	Baseflow dominant TIN, DRP	Floodflow significant Part. N, P	Natural wetlands (potential)	Critical source areas	Xport	Sink
Hamurama Hauraki 15 km2	Dairy x 3 S&B x 5 < 40ha x 55 <4ha x 110 Urban	60t 7t	55t 6t	.	4ha (2ha)	Spring		
Awahou Waimehia 20 km2	Dairy x 8 S&B x 4 <40ha x 55 <4ha x 110 Urban	65t 4t	61t 4t		100ha (2ha)	Spring		
Puarenga 80 km2	Dairy x 3 S&B x 3 <40ha x 55 <4ha x 110 Urban	80t 7t	63t 2t	16t 5t	60ha (14ha)	RLTS Dense gorse	Flood flows	Alum
Utuhina 60 km2	Dairy x 0 S&B x 7 <40ha x 55 <4ha x 110 Urban	60t 6t	42t 3t	16t 3t	(12ha)		Flood flows	Alum
Waiowhiro 15 km2	Dairy x 0 S&B x 2 <40ha x 55 <4ha x 110 Urban	15t 1t	11t 0.3t		42ha (26ha)			
Ngongotaha 80 km2	Dairy x 3 S&B x 20 <40ha x 55 <4ha x 110 Urban	70t 4t	44t 1t	24t 3t	7ha (15ha)		Flood flows	
Waitete 60 km2	Dairy x 7 S&B x 18 <40ha x 55 <4ha x 110 Urban	50t 3t	47t 1t		70ha (22ha)			
Waiohewa Rotokawa 10 km2	Dairy x 0 S&B x 9 <40ha x 55 <4ha x 110 Urban	30t 1t	28t 0.2t		4ha (6ha)	Dense gorse		
Waingaehe Waitawa 10 km2	Dairy x 1 S&B x 0 <40ha x 55 <4ha x 110 Urban	10t 1t	10t 1t		3ha (13ha)	Dense gorse		
Catchment Total		440 t N 48 t P			300ha (100ha)			

Relief Sought

Relief Sought: s32 Report

- Complete more robust cost-benefit analysis of PPC10 alongside analysis of the FFNZ proposal for maintaining the trajectory of nutrient reductions through to 2022 or thereabouts

  - pending the Science Review, and

  - pending the Rotorua Lakes WMA process to give effect to the NPS-FW, informed by the results of that Science Review

- Test the extent to which the approach recommended by FFNZ could address concerns for other stakeholders (maori land, forestry, RDC) in the period through to 2022 (eg, any practical timing issues relative to planned developments?)

Relief Sought: PPC10 Introduction

- Add relevant RWLP & RPS objectives, policies, methods
- Scope includes all contributing landuses
- Purpose to maintain the trajectory of nutrient reductions to support achievement of the TLI
- Add section on the Incentives Scheme (objective to identify interventions that most effectively & efficiently deliver the outcomes)
- State that from 2020, the Rotorua Lakes WMA will review values, objectives, limits and methods, preliminary to a further plan change to give effect to the NPS-FW

Relief Sought: Introduction ctnd

- Lake State and Trends: add summary of
  - current state, ie, achieving TLI
  - recent trends, ie, improvements since 2001 *(FFNZ Annex D)*

- Lake Science: acknowledge significant shifts in the science informing the targets, state research priorities

- Lake Targets: add Science Caucus agreements, including that "*managing P alone could plausibly and effectively deliver the same outcome as managing N and P together*"

Relief Sought: Introduction ctnd

- Add summary of upcoming reviews, including
  - 2017 Science Review
  - 2017 Independent QA Review of Incentives Scheme
  - 2018 Five year review of RPS
  - 2020 Commence Rotorua Lakes WMA

- Add summary of agreed underpinning principles, including
  - enable innovation, flexibility, adaptive management -
  - encourage collaboration and collective solutions
  - acknowledge legacies, cost sharing partnerships
  - prioritise “best bang for buck” interventions

Relief Sought: Introduction ctnd

- Add section describing Integrated Nutrient Management Framework

  - a different balance of regulatory & non-regulatory methods, intended to guard improvements made, and as an enabling framework to engage the pragmatism, ingenuity and innovation of the catchment community to drive improvements

- Introduce the concept of subcatchment action plans in partnership between council, industry, landowners and community to help give effect to the higher level Lakes Action Plan

- Add subcatchment map and information describing current landuse and current nutrient loads/patterns

  - an initial platform of sub-catchment specific information to assist in prioritising the resourcing and timing of sub-catchment plans

Relief Sought: Objectives & Policies

- Add new objectives to provide for recognition of multiple catchment values, including rural production

- Amend policies to express higher intent

- Delete reference to Overseer version 6 pending proper evaluation of attenuation and re-estimation of loads
  - delete individual NDAs
  - provide for future development of community agreed MRTs
    (eg, by sub-catchment, source of flow, sector)
  - provide for development of a range of flexibility mechanisms
    (eg, offsets, TDRs, baseline-and-credit markets)

Relief Sought: Methods

- Add method for active resourcing of sub-catchment plans
  - reduce council resources on consent administration
  - increase staff supporting action-on-the-ground
  - invest in independent sub-catchment coordination

- Add modified method 41 for Sub-catchment action plans
  - including attention to both water quality and biodiversity

- Expand science review to include indigenous species

Relief Sought: Rules

- Replace PPC10 rules with FFNZ simplified rules
- Provide for farming as PA subject to not exceeding benchmark
- Require consents for increases
- Provide flexibility for development/increases via offsets
- Provide for farms to be managed as whole farms
  - not as “effective” area or “blocks”

Relief Sought: Schedules

- Add new schedule – information required for benchmark
- Delete Schedule LR 1 – MRTs and NDAs
- Retain Schedule LR 3 – information required for PA rules
- Delete Schedule LR 5 – reference files
- Amend Schedule LR 6 – NMP requirements
  - subject to NMPs not being a regulated requirement
- Amend Schedule LR 7 – transfers and offsets

Conclusion

- We share the same goals

  - the differences are how we best work together to achieve them

- FFNZ propose a comprehensive integrated framework

  - a key element is enabling development of sub-catchment plans to engage catchment communities and prioritise bang-for-buck interventions

- The intent is to maintain the trajectory of nutrient reductions for the upcoming period through to 2022

  - pending the 2017 Science review and the upcoming Rotorua Lakes WMA to give effect to the NPS-FW.

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ENDS

Restoring the Rotorua Lakes
PCE, 2006

"This is at least a 50 year journey. The baton will have to be passed to many people over the decades. The biggest challenges are not the technical or even the financial ones, but the very human ones of keeping up the team spirit and effort over decades"

Managing fresh water in New Zealand