Water and Land Working Party

Wednesday 29 July 2020 at 1:00pm

AGENDA

Northland REGIONAL COUNCIL

Te Kaunihera ā rohe o Te Taitokerau

Water and Land Working Party Agenda

Meeting to be held in the Council Chamber
36 Water Street, Whangārei
on Wednesday 29 July 2020, commencing at 1:00pm

Please note: working parties and working groups carry NO formal decision-making delegations from council. The purpose of the working party/group is to carry out preparatory work and discussions prior to taking matters to the full council for formal consideration and decision-making. Working party/group meetings are open to the public to attend (unless there are specific grounds under LGOIMA for the public to be excluded).

MEMBERSHIP OF THE WATER AND LAND WORKING PARTY

Chairperson, Councillor Justin Blaikie

Councillor Jack Craw	Councillor Amy Macdonald	Councillor Marty Robinson
Councillor Joce Yeoman	Ex-Officio Penny Smart	TTMAC Representative Georgina Connelly
TTMAC Representative Alan Riwaka	TTMAC Representative Janelle Beazley	TTMAC Representative Mira Norris
TTMAC Representative Victor Holloway		

TITLE: Review of Action Points from the Last Meeting

ID: A1340940

From: Kathryn Pabirowski, Regulatory Services Admin/PA

Executive summary/Whakārapopototanga

The purpose of this report is to enable the meeting to receive the current action sheet.

Recommendation

That the actions from the previous meeting be reviewed.

Attachments/Ngā tapirihanga

Attachment 1: Action Sheet - 29 April 2020

Authorised by Group Manager

Name: Colin Dall

Title: Group Manager - Regulatory Services

Date:

ACTIONS – Water and Land Working Party

29 April 2020

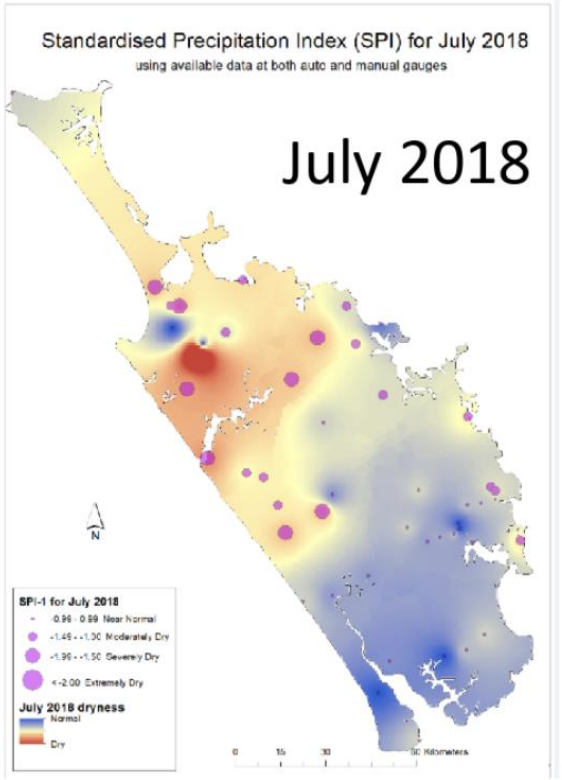
Item	Agreed Action	Action By
3.0 Terms of Reference	▪ Terms of Reference to be circulated to the members.	Kathryn Pabirowski
4.0b Water Quality Modelling	▪ A presentation to be organised with NIWA and Land and Water to update the working party.	Ben Tait
4.0c Operational Programmes	▪ Provide fish survey/ecological information regarding the upper Parapara Stream.	Colin Dall
5.0 GIS Presentation – Physiographics & Erosion in Relation to NESPF Erosion Classification	▪ MPI/Government to be advised that NESPF erosion classification is not a good reflection of erosion risk in Northland and asking that the NESPF be reviewed in this regard.	Bruce Howse
	▪ To create a strategic roadmap and provide an update to the Policy and Regulatory Working Party.	Bruce Howse Duncan Kervell Ben Lee
6.0 Non-Regulatory Land & Water Programmes – Future Thinking	▪ A glossary of acronyms to be made available to the working party members.	Duncan Kervell
7.0 Taranaki Riparian Planting	▪ A copy of the memo and report to be provided to Victor Holloway.	Manas Chakraborty

2020 Drought & Improving Water Resilience

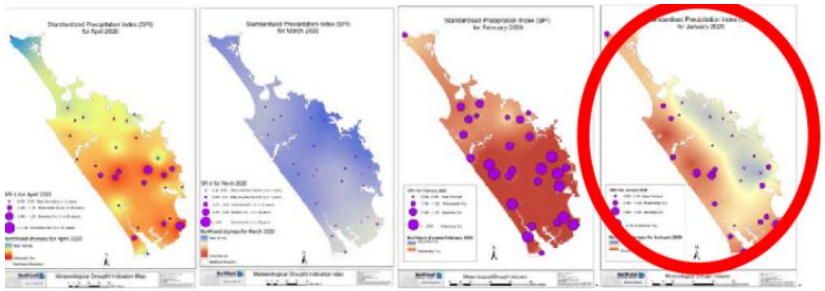
Northland REGIONAL COUNCIL
Te Kaunihera ā rohe o Te Taitokerau

1. NRC Drought system and prediction work
2. Coastal aquifer risk assessments
3. PGF Water Resilience ideas

NRC Drought system

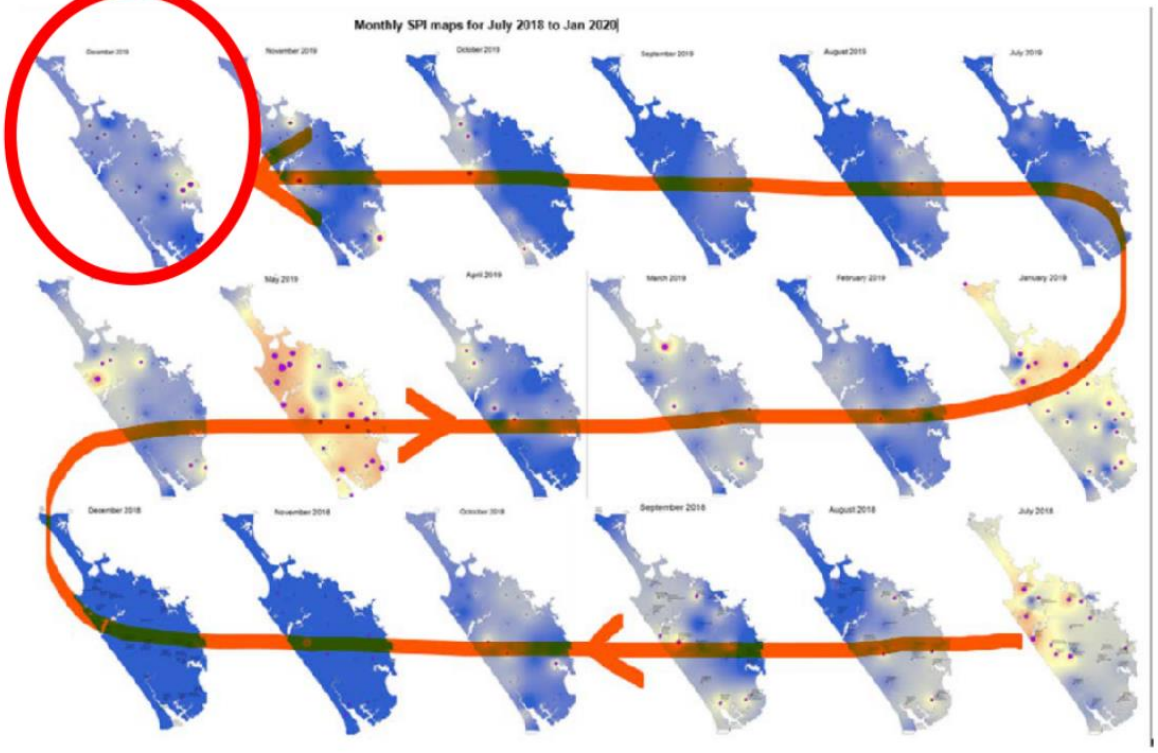


Northland REGIONAL COUNCIL
Te Kaunihera ā rohe o Te Taitokerau

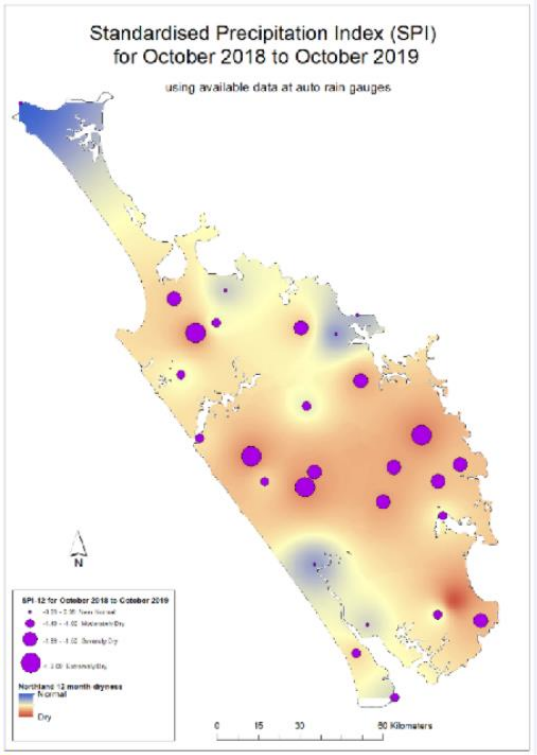


January 2019

December 2019



November 2019



MEDIA RELEASE — Northland Regional Council

0800 002 004 | www.nrc.govt.nz — Te Kaunihera A Rohe O Te Taitokerau

Date: 26 November 2019 — Number of pages: 02

Hydrological versus meteorological drought

When is a drought not a drought? When it's a hydrological drought instead of a meteorological drought.

Confused? You're not alone, but a Northland Regional Council scientist and her manager are investigating the differences between – and local implications of – the two drought types in Northland.

Hoa Pham, council's Resource Scientist - Surface Water, with the support of her manager, Natural Resources Science Manager Jean-Charles Perquin, has recently written an article on the issue for the New Zealand Hydrological Society and will be presenting to the society's upcoming conference in Rotorua early next month. *(Series 01-05 December)*

Ms Pham says in very broad terms, the simplest explanation of meteorological drought is what most people understand a drought to be – a lack of rain over a reasonably long time makes things very noticeably dry.

"It's pretty easy to measure low rainfall and for how long this has been going on."

But hydrological drought is arguably more complex and is what happens to the region's actual hydrological processes, its rivers, lakes, reservoirs and groundwater, especially over the longer term.

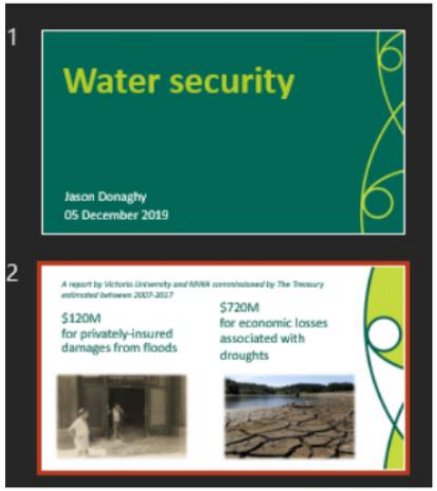
In some cases, the impacts of meteorological drought are still effectively impacting on local stream flows – which can remain lower than usual – more than a year after the rain comes again and a drought appears to be well and truly over.

"The duo is currently investigating the relationship between the two types of drought, including the historical impacts (including severity) of meteorological droughts, their influence on stream flows and how these can be used to model current and future impacts.

Ms Pham says with Northland experiencing a number of droughts in recent years, their research is expected to provide valuable and useful information, noting that over the period studied for the presentation (July 2010-June 2019) the amount of water in some Northland streams had reduced dramatically.

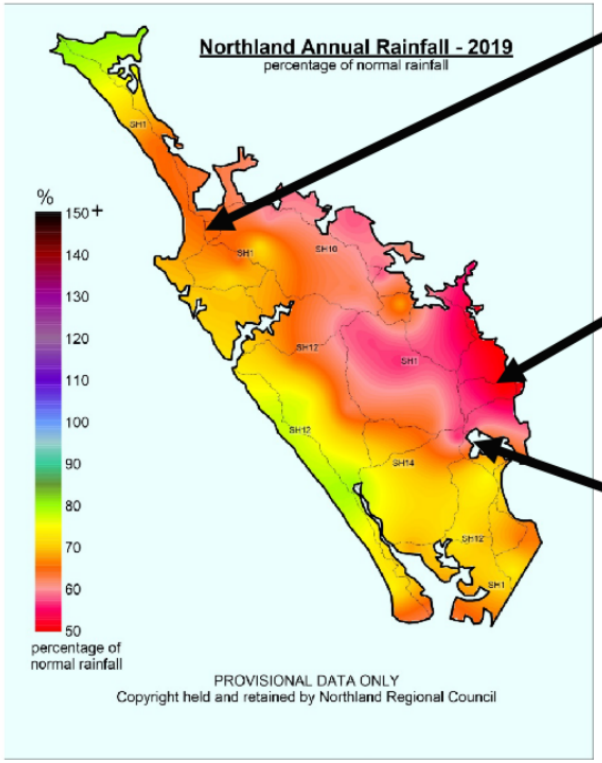
"The regional council is already keeping a close eye on the water situation in Northland with the region inching ever closer to another potentially dry summer and local authority water restrictions already in place in some areas.

MORE



Northland REGIONAL COUNCIL
Te Kaunihera ā rohe o Te Taitokerau

Breaking records in December 2019



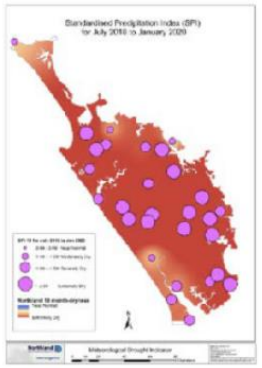
The Kaitāia area had recorded the driest year since records began in 1949 (791mm compared to an average 1350mm).

1100mm of rain was recorded in the Puhipuhi nearly half the average 2000mm annual rainfall, making it the second driest year there since 1914.

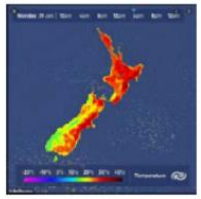
Whangarei recorded 837mm recorded at its airport, the driest since records began in 1943 (and compared to a yearly average of 1364mm).

January 2020

Region wide impact

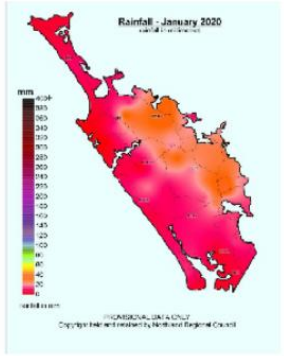


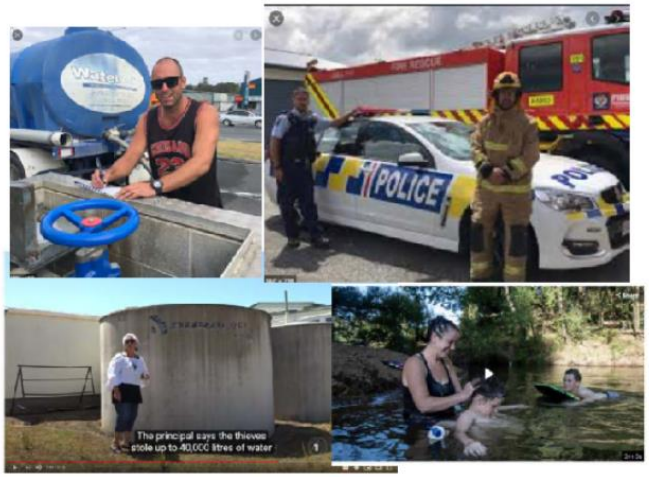
Heat wave



Situation starting to compound

Minimal rain



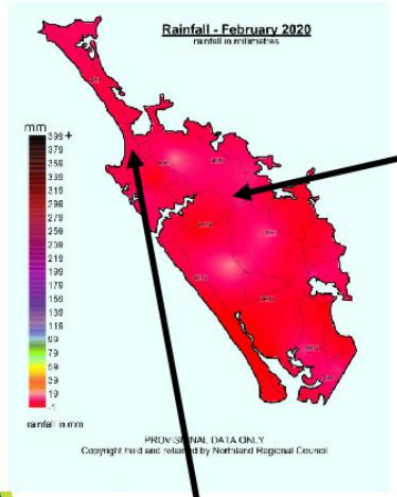


ISSUES

- Police brought in re-enforcements
- Fights breaking out over water
- People stealing water
- Fire-Service having issues securing water from properties
- Lack of water drove communities to bath in streams
- Tanker drivers blowing their hours out

February 2020

Still minmal rain



Residents left in the dark over Kaikohe water crisis

NORTHLAND AGE

The Army arrives in Kaitaia

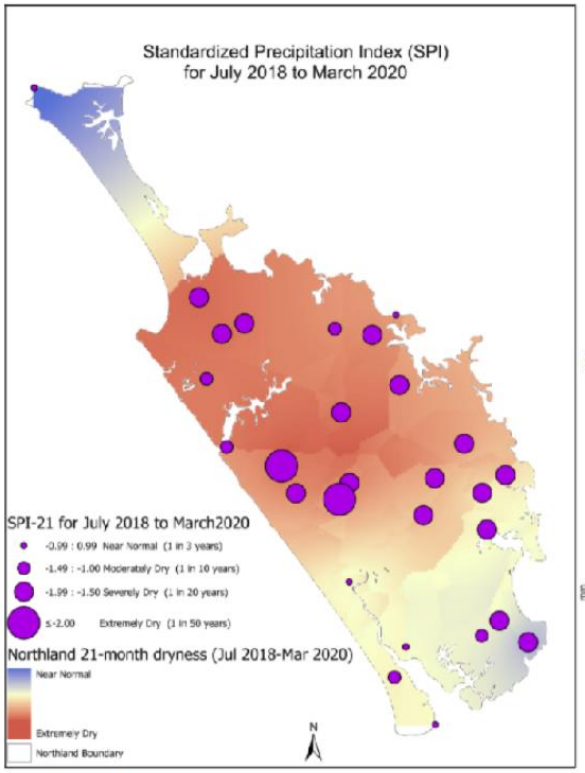
The 2 Combat Service Support Battalion team from Linton Military Camp, in Palmerston North, has arrived in Kaitaia with three MHOV vehicles, with water tanks installed, and a Pinzgauer workshop repair wagon for the

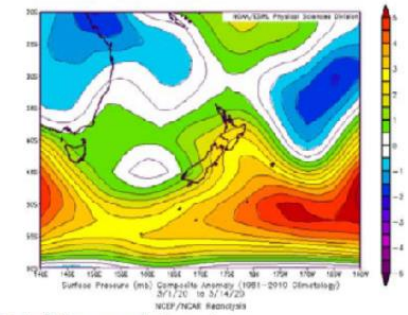
ISSUES

- Major towns and communities running out of water and angry about lack of warning
- Hospitals running out of water, dialysis patients major water users
- Ngawha Prison could run out of water
- Pipe failure due to ground cracking
- Fonterra Kauri Factory running out of water, when the company was supplying tankers to transport water
- Significant backlog at freezing works, destocking was an issue
- Farmers under Mbovis lockdown with no water
- Army tankers too heavy for rural bridges

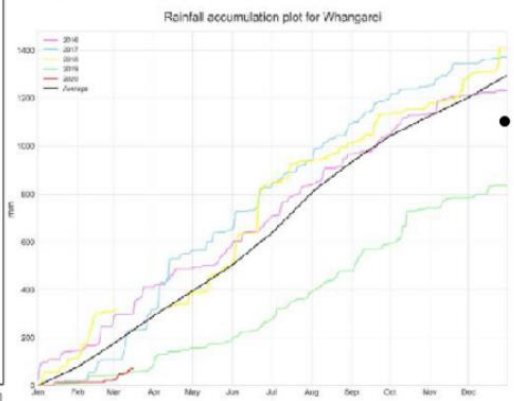
Northland REGIONAL COUNCIL
Te Kaunihera ā rohe o Te Taitokerau

March 2020





Rainfall accumulation plots



ISSUES

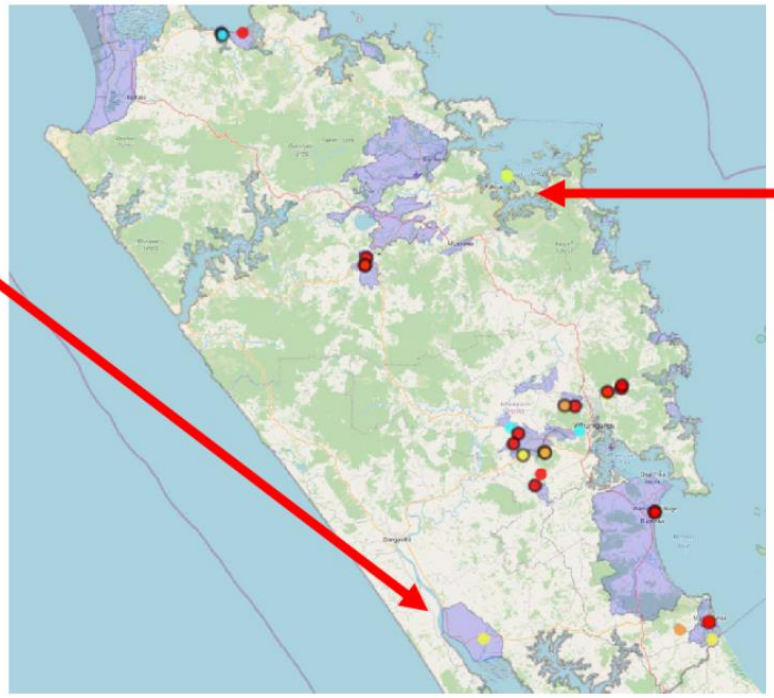
- Isolated reports of salt water intrusion, coastal aquifers shutdown
- Back up lake supply to Kaikohe with potential water quality issues (cynobacteria)
- Whangarei main water supply dam at 47%

Coastal aquifer risk assessments

Rūāwai risk assessment, key finding:

RISK = yes in long periods of dry weather

As a result, a significant decline in seasonal groundwater levels (such as observed during the 2019-20 year) is unlikely to present an increased water quality risk to the KDC Rūāwai supply. Severe drought conditions over consecutive winters, may result in more rapid changes in salinity than historically.



Russell risk assessment, key finding:

RISK = yes in long periods of dry weather

There is an elevated risk of brackish water migrating into the capture zone of existing bores along York Street (and potentially further inland). This risk may have increased in recent years due to an extended period of below normal rainfall since early 2018.

Northland REGIONAL COUNCIL
Te Kaunihera ā rohe o Te Taitokerau

Coastal aquifer risk assessments

Rūāwai report recommendations

1. Recommended that allocation from the unconfined and confined aquifers is managed separately.
2. NRC initiate a program to cap free flowing bores in the Rūāwai Aquifer.
3. Regarding KDC supply bores:
    1. Adjust daily take volume
    2. Implement continuous monitoring at the take bore
    3. Establish a two-trigger level system to manage the potential risk of seawater intrusion.

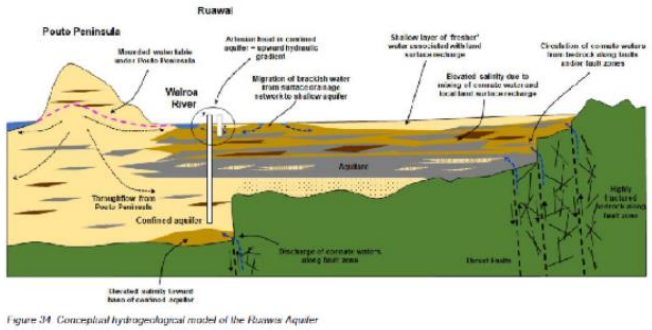


Figure 34: Conceptual hydrogeological model of the Ruawai Aquifer

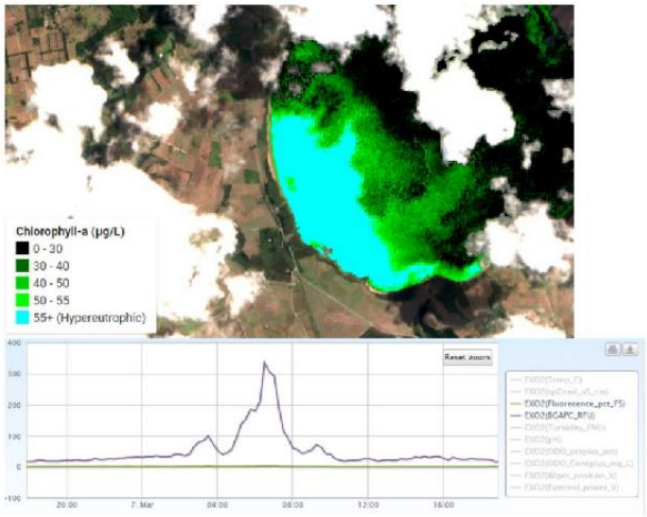
Russell report recommendations

1. Limit further consented groundwater abstraction from the Russell Aquifer.
2. Undertake a survey of permitted groundwater abstraction.
3. Establish a groundwater user group as a mechanism to inform users of potential seawater intrusion issues.
4. Establish a monitoring site (groundwater level and EC) in the unconfined aquifer.
5. Council establish a two-trigger level system to manage the potential risk of seawater intrusion.

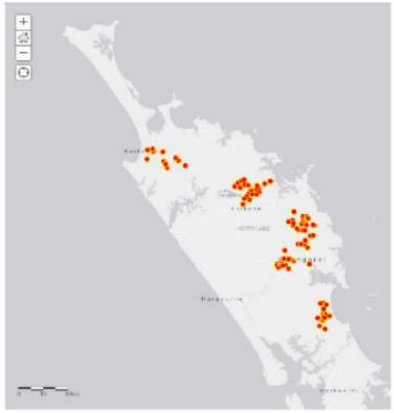
Key Learning

Capacity to scale up monitoring & resourcing quickly was challenging

SAT imagery



Survey 123

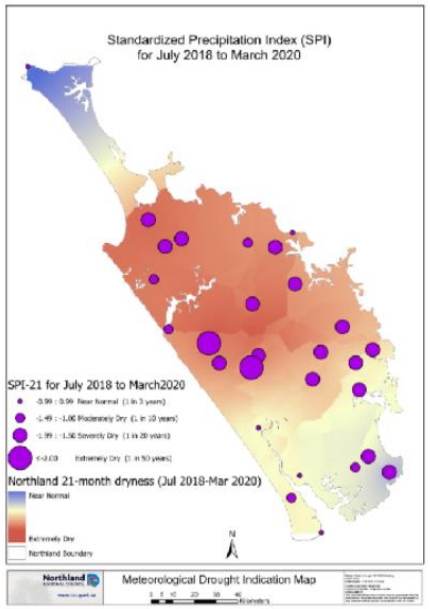


IOT sensors

Key Learning

Increase predicative capability

NRC drought maps



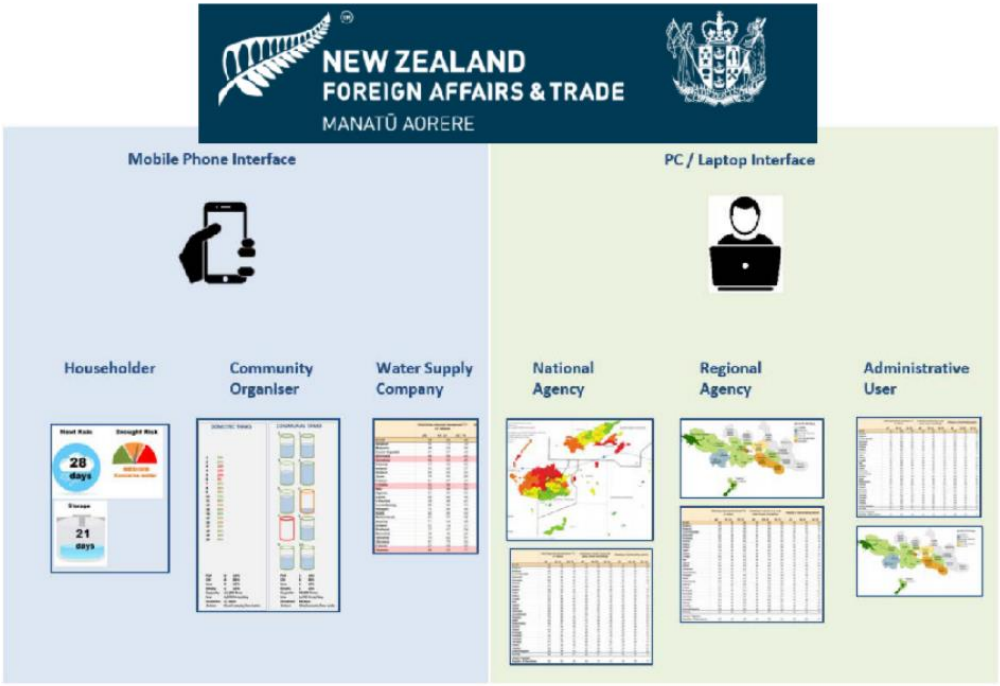
Northland REGIONAL COUNCIL
Te Kaunihera ā rohe o Te Taitokerau

PGF Water Resilience ideas

- Online Tool for Identifying Onsite Water Storage Sites
- Flexi Tanks
- Installation of Emergency Water Supply Groundwater Bores
- Managed Aquifer Recharge (MAR)
- Increased Water Resilience Funding and Advisory Services
- Spatial plan for PDU

Water Resilience Project

Pacific Drought Early Warning System



Northland REGIONAL COUNCIL
Te Kaunihera ā rohe o Te Taitokerau

Stakeholder Collaboration

- 4 Waters Advisory Group & Northland Drinking Water Joint Working Group
- Water supply resilience now a standard item
- Working closer with major water users
- Northland Water Collaboration initiative

Improving our game

- Regional Drought Response Plan
- Increasing our understanding of our groundwater resources
- Moving more towards predictive models
- Early and consistent comms

Northland REGIONAL COUNCIL
Te Kaunihera ā rohe o Te Taitokerau

Challenges

- Affordability
- Increasing water supply resilience of those in rural/unreticulated areas
- Increasing public awareness


Any questions?
Ngā Mihi - Thank you

Example of Budget for Catchment Restoration Contracting Gang

Works to be Undertaken (period)	Detail of Works	Hours Required	Costs based on living wage (team leader on higher rate)
Period ONE – Fencing and pre-planting site preparation	Based on fencing audit from landowner agreements and pre-planting weed removal audits by co-ordinator. Team to establish fit for purpose stock exclusion fences and carry out removal of identified weeds and trees e.g. willow privet and woolly knightshade.	Works start 30 November and proceed until 2 of April. 76 days @ 8hrs = 608 hrs	608 hrs @ $22.10 = $13.436.8 x 3 team members = **$40,310.4** Team Leader 608 x $32.10 = **$19,516** **Total – Period ONE** **$59,826.4**
Period TWO – Planting	Spot spraying and planting.	Works start - 5 April end 30 July 85 days @ 8 hrs = 680 hrs	680 hrs $ $22.10 = $15,028.00 x 3 team members = **$45,084** Team Leader 680 x $32.10 = **$21,828** **Total – Period TWO** **$66,912**
Period THREE – Post planting releasing of plantings	Release spraying of planted eco sourced natives.	Works start – 30 August end 8 October 30 days @ 8 hrs = 240 hrs	240 hrs @ $22.10 = $5,304.00 x 3 team members = **$15,912** Team Leader 240 x 32.10 = **$7,704.00** **Total – Period THREE** **$23,616**
TOTAL LABOUR COST			**$150,354**

Catchment Restoration – at Potential LTP funded Program

- Purpose – Improve water quality, both abiotic and biotic through a program which delivers the fencing, planting and maintenance of eco sourced native plants both on riparian margins and remnant wetlands.
- Scientific Evidence – based approach – key question – If we want to improve water quality in Northland and reduce sediment entering our estuaries and harbours we have limited levers to achieve this. Which is the best lever to invest in?
- Long-term – Changes in land use and afforestation of highly erodible land (may speed up if sediment included in NESFW changes).
- Short-term – Stock exclusion and riparian planting (almost certain to be enshrined in new NESFW i.e. buffer zones determined).

Some key considerations and questions:

- There are already community led avenues for developing these programs that NRC staff are aware of.
- GIS mapping can be used to accurately cost out projects in specific sub catchments.
- Why would we continue to fund fencing if it becomes a regulatory tool?
- There is some evidence to show that over time riparian planting can improve farm profitability.
- We already understand the relationship between water quality and buffer distances (staff report to NRWP).
- This program provides employment and can be set up within 6-8 months. (Employment can be year-round i.e. nursery work, weed control work and pest control i.e. fur recovery).
- How can productive riparian zones and Carbon credits be worked into the program? (i.e. GIS recording of projects/sequestration potential field testing)
- Council staff have already recognised the need for more contractors to be established that can work in this space.

Key issues and hurdles:

- Costly.
- Water reticulation costs for land owners – although this will have to be addressed once NESFW and regional plan stock exclusion takes effect.
- Uptake by landowners.

One obvious key benefit for Northland is that by simply costing out the potential of a program such as this for several sub-catchments – NRC will be ready to strike if funding opportunities open up at any time through central government.

Summary

For many years the debate on water quality in Northland has focused on the rights of landowners at the expense of water quality and cost benefit analysis instead of a regional commitment and associated operational programs that will deliver results i.e. Taranaki Riparian Planting Program – https://www.trc.govt.nz/assets/Documents/Research-reviews/Land/TransformingTaranaki2019.pdf

Ecological Restoration- contracting gangs....

- Summary- focus on providing transparent/ value for money returns on ratepayer investment- can also leverage off Central Government Funding.
- Easily tracked KPIs.
- Employment creation.
- Can integrate across all aspects of NRCs portfolio- i.e. Water quality and soil conservation, B&B (pest plant control/eradication and bio blitzs), Kaitiaki rangers and coast care.
- Can be led by Maori organizations, which facilitates strong partnerships.
- Focus on roll out of mitigation tools as outlined in Kaipara remediation business case.

Some scene setting aspects...

- Water quality was highest priority in last LTP.
- Soil erosion environmental effects on estuarine and coastal ecosystems is very hard to reverse....
- Terrestrial conservation well funded.... can we say the same for freshwater and estuarine/coastal/harbours ecosystems.
- Focus has been on fresh water quality- not ecosystem function - restoration/remediation. i.e. from the ranges to the sea.

http://www.stuff.co.nz/auckland/local-news/northland/2525887/Orca-get-Hokianga-on-Discovery-Channel

Water quality seen as a number 1 priority for NZ communities –

- A new opinion poll has revealed pollution in New Zealand's rivers and lakes is worrying Kiwis more than any other issue.
- The nation-wide Colmar Brunton poll conducted for Fish & Game New Zealand in December (2018) showed that 82 per cent of people surveyed were extremely or very concerned about the issue.
- Freshwater pollution was also the top concern, beating living costs and the health system, which were 78 per cent and 72 per cent respectively. Four percent of the respondents said they were not that concerned with the pollution of lakes and rivers.

TE AO MĀORI

Kaipara snapper mutating - NIWAA

7:21 am on 1 September 2014

Share this

The gills of juvenile snapper in Kaipara Harbour are mutating due to increased sediment on the sea floor, the National Institute of Water and Atmospheric Research (NIWA) says.

The Kaipara Harbour estuary. Photo: Photo NZ

NIWA marine ecologist Meredith Lowe said increased farming, including dairying, more intense and frequent storms, and highly erodible soils are contributing to high loads of sediments entering the moana.

The Kaipara is the largest harbour in Aotearoa and Dr Lowe said it is an important snapper nursery. When the fish grow up and move out of the estuary, they make up more than 80 percent of the North Island's west coast snapper population.

Dr Lowe said the seagrass that the snapper lives in is being smothered by the sediment, so the snapper are unable to see their prey or breathe easily.

She said their gills are mutating because they are so vulnerable to the increased sedimentation.

Dr Lowe said the increase caused the fish to put down more cells in their gills to stop the sediment particles from getting across and into their blood stream. When there were too many of the cells they thicken up and are fused together.

She also warned that the sediment predisposes the fish to bacterial infection and reduces their growth rates.

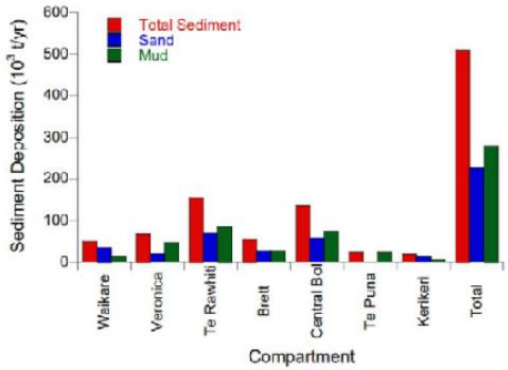


Figure 18: Annual sediment deposition rates (tonnes per year) in each compartment for total sediment, mud and sand fractions.

Table 2: Land-use source contributions (%) to the sediment deposited in the river delta in each inlet. Main land-use types are shown. Sources with <1% are unlikely to be present, sources with <5% may be present, sources with >5% are present. Level of uncertainty of values are <5%.

Source soil	Pasture (cattle)	Pasture (sheep)	Pasture (sub-soil)	Native (broadleaf)	Pine (clear-fell)	Kanuka (scrub)
Te Puna Inlet	27.0	32.4	<1	3.5	36.7	<1
Kerikeri Inlet	13.6	44.7	34.8	6.8	<1	<1
Waitangi Inlet	37.7	17.2	42.4	2.6	<1	<1
Kawakawa Inlet	68.3	<1	<1	2.7	27.5	1.2
Waikare Inlet	<1	<1	<1	26.6	<1	72.4

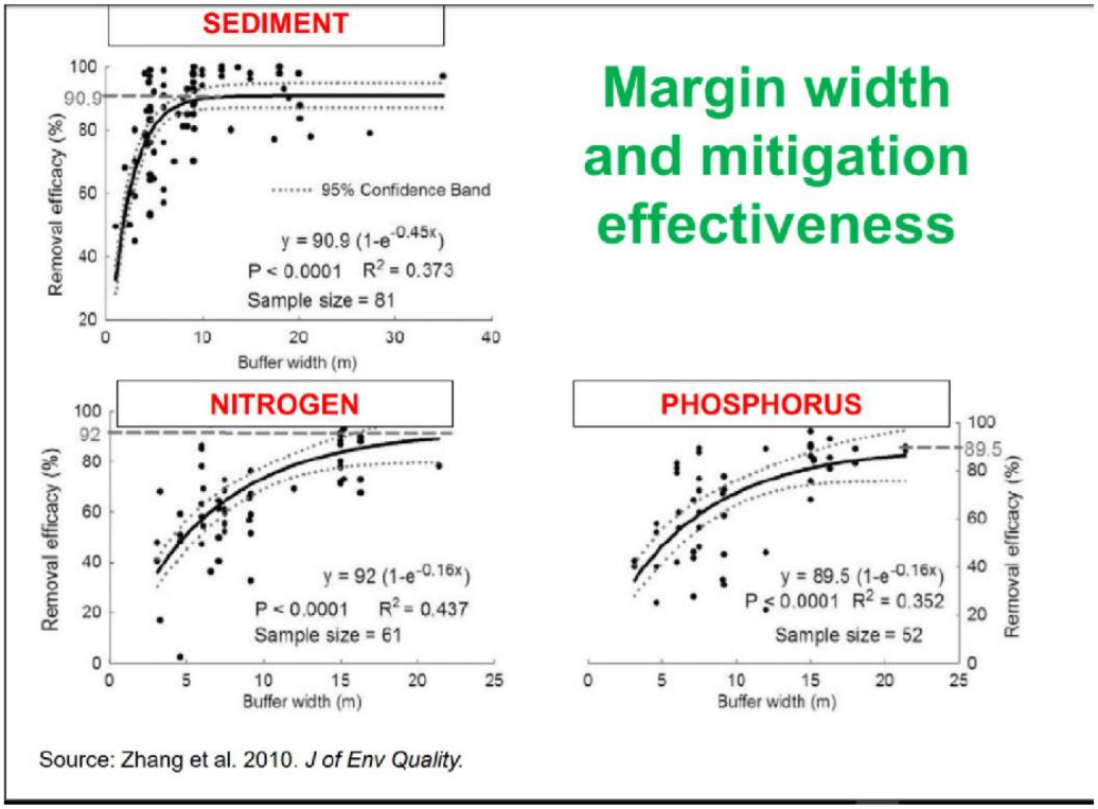
Sediment modelling

Recent SEDNET[4] sediment modelling has estimated sources of sediment per annum in Waitangi – total sediment volume from the whole catchment is estimated at 36,076 tonnes per year from 301km^2 (120 tonnes/km^2/year or 1.2 tonnes/hectare/year). Much of this sediment load is delivered during high rainfall events which is difficult to remedy however, some erosion types on land can be addressed.

The SEDNET model estimates the proportion of sediment sources as:

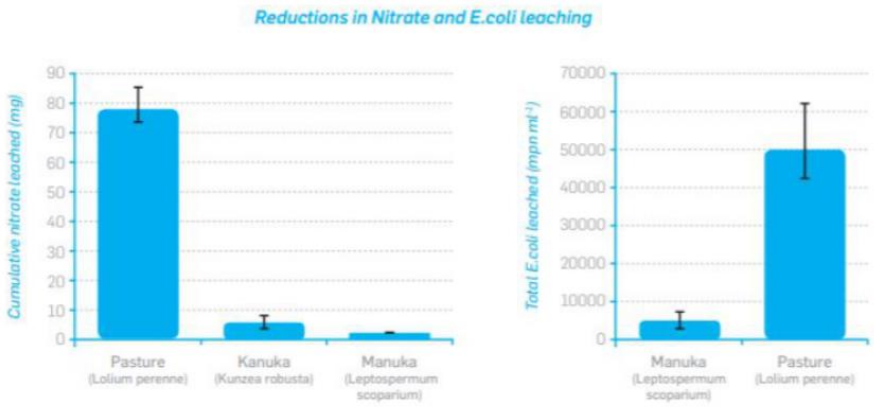
- 38% from pasture;
- 24% from woody vegetation; and
- 38% from streambank erosion.

Water quality Science.



The research team at CIBR have shown that incorporating bioactive plants into bio-diverse riparian planting schemes has the potential to both filter and inactivate pollutants from intensive agriculture leading to improvements in water quality.

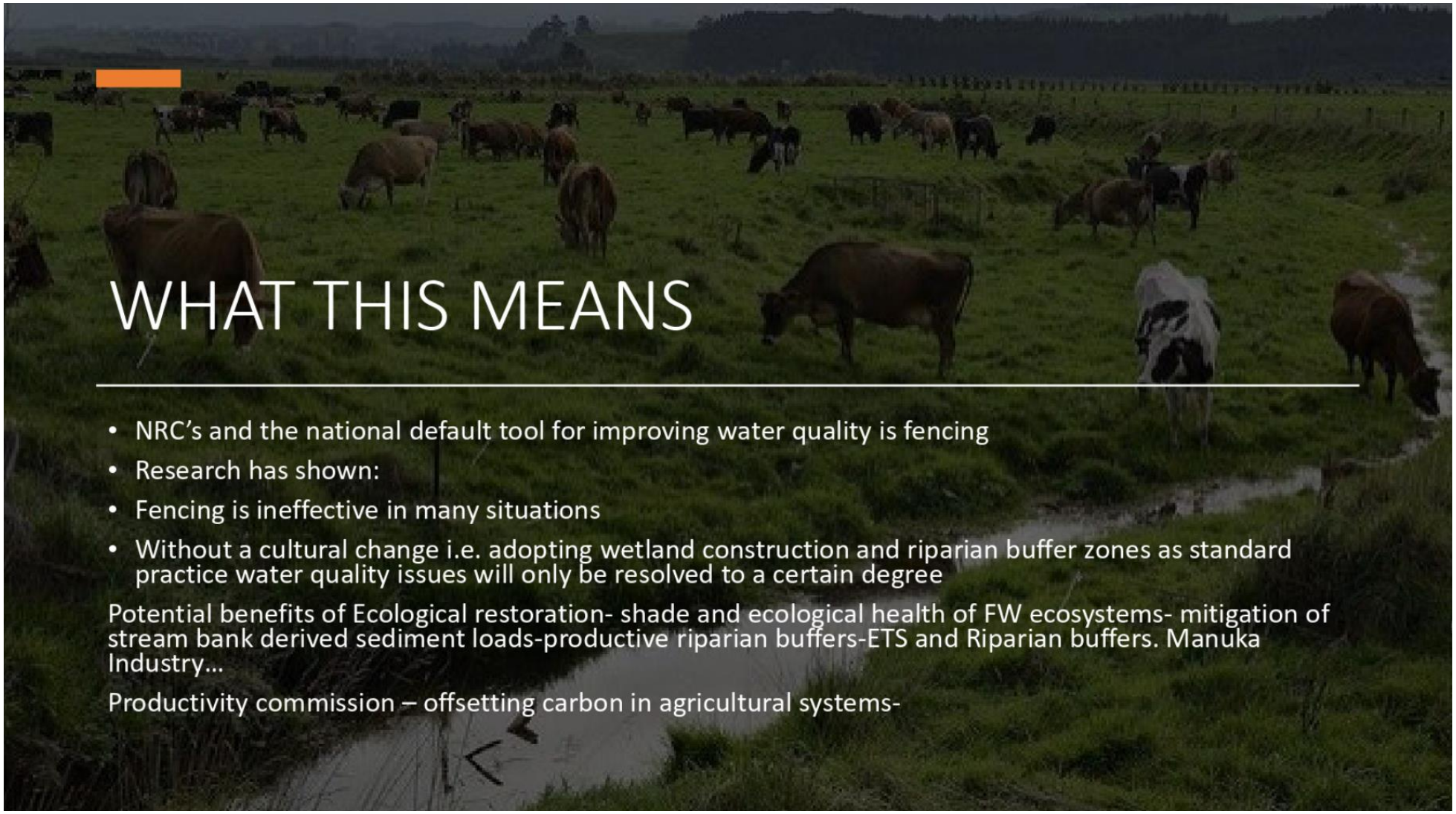
"bioactive/antimicrobial compounds produced by myrtaceaeous plants, especially Mānuka (Leptospermum scoparium), can inhibit the conversion of ammonia into nitrate and nitrous oxide, and also enhance the die-off of pathogenic organisms in the wastes that pass through their root systems."



Manuka Research

- Seeps and naturalised wetlands, is there an opportunity worth exploring here in terms of the Productivity Commission's recent report regarding off setting agricultural emissions.?
- It may be a desirable option to utilize manuka for water quality improvement and offsetting carbon emissions using GIS to quantify are under afforestation.
- Are there issues in terms of Carbon offsetting in NZ- i.e. what size/ shape of forest is acceptable/compliant.


What this means....
Improvements in terms of water quality are to some degree limited
E.g. R. W. McDowell et al 2017 ;Loads from low-order small streams (<1 m wide, 30 cm deep, and in flat catchments dominated by pasture) exempt from potential fencing regulations accounted for an average of 77% of the national load (varying from 73% for total N to 84% for dissolved reactive P). This means that to substantially reduce contaminant losses, other mitigations should be investigated in small streams, particularly where fencing of larger streams has low efficacy.
Ag Research findings in relation to water quality and fencing.


WHAT THIS MEANS
• NRC's and the national default tool for improving water quality is fencing
• Research has shown:
• Fencing is ineffective in many situations
• Without a cultural change i.e. adopting wetland construction and riparian buffer zones as standard practice water quality issues will only be resolved to a certain degree
Potential benefits of Ecological restoration- shade and ecological health of FW ecosystems- mitigation of stream bank derived sediment loads-productive riparian buffers-ETS and Riparian buffers. Manuka Industry…
Productivity commission – offsetting carbon in agricultural systems-

- Contracting gangs yearly cycle

- Spring summer- weed control-catchment restoration maintenance-fencing-pest blitzes-native plant propagation
- Autumn last of fencing- planting preparation, and pest control.
- Winter- planting late, winter releasing- fur recovery.

This is not just riparian planting its wetland restoration- planting of seeps, SCHARP program (poplars), establishment of bunds (sediment traps). Planting of highly erodible land

- Can be scaled up if new opportunities arrive e.g. underplanting of hardwoods into scrubland for ETS & MFE FUNDS

Kaikohe and surrounds - Streams

Time and scale-
use of upcoming models of interventions to understand costs and examine timeframes-

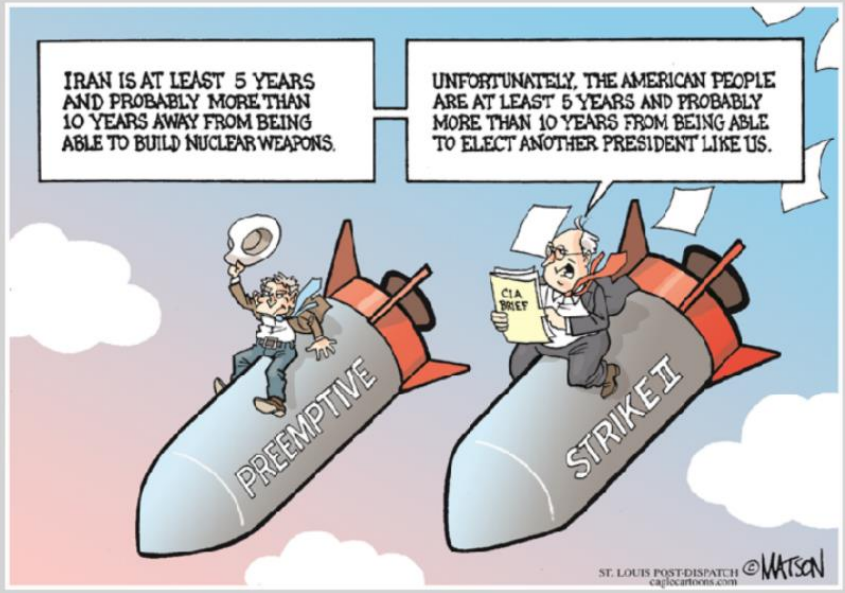
- 20km's at 5m buffers is 20 Ha of Ecological restoration-
-100,000 seedlings
-fencing timeframes-installation.
- pre planting maintenance
-planting
-releasing/weed control.

Remainder of time- pest plant work- pest blitzes nursery production. Poplar planting etc.

Geographical spread of ERCGs..... cost vs spread and rate of restoration

- Plenty of reasons tautoko the concept….beating the counter arguments

- Affordability- when we look at affordability why do we take into account TAs rates-that's not our business.
- MFE funding will do the job and we have the Kaipara Remediation Project – other Harbours should wait in line- why??
- We should just leave it to regulation? I have presented some science behind why we cant leave it to regulation. (further more ECG's can tackle FEP's which will in my opinion be the lynch pin, particularly for dairy).
- Regulation is costly- why don't we monitor & test against ecological restoration?? Challenge CG- create the rock-solid scientific backdrop for CG funding….
- Lets just change land use….. How and what are the implications??



Dung beetles positive pastoral performers for Northland

Dr J J Dymock

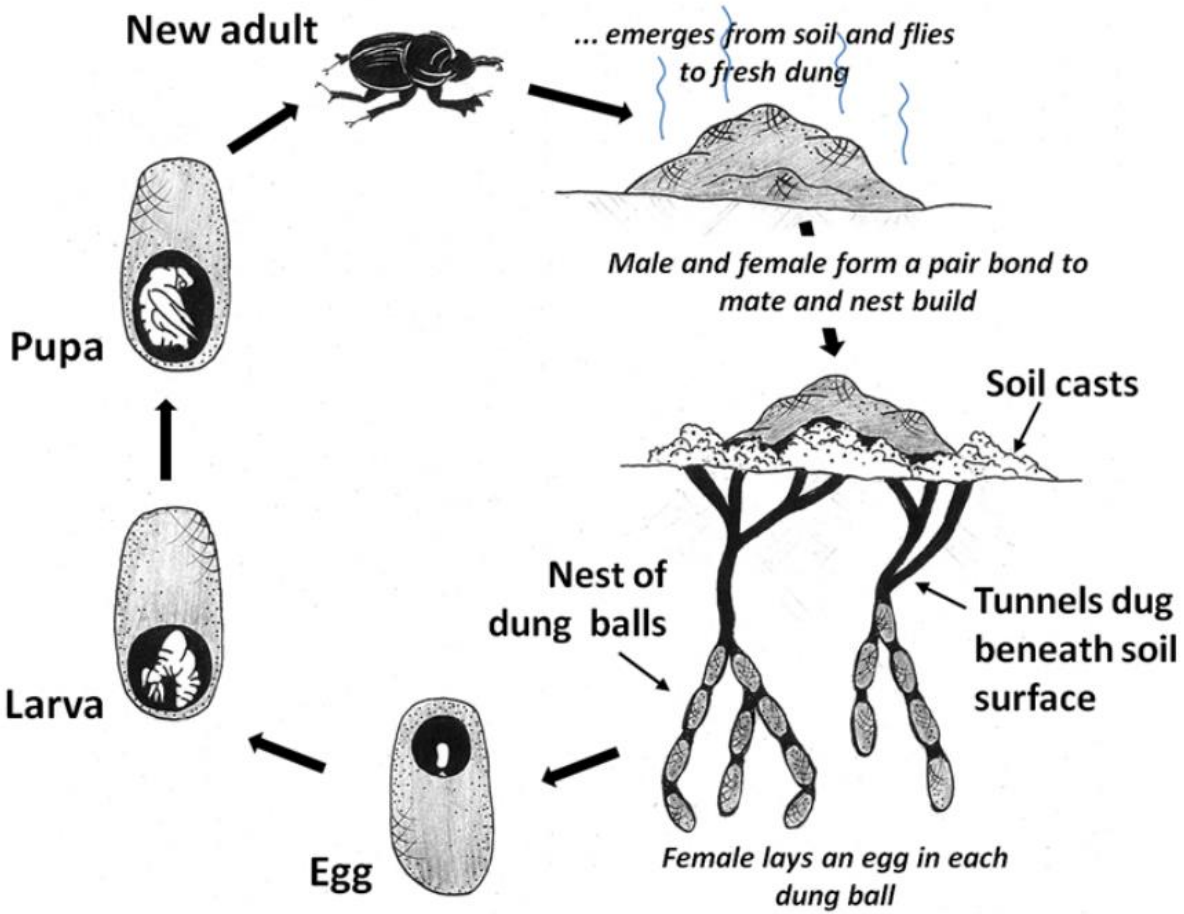
Why introduce dung beetles?

- The amount of excreta produced by grazing animals in New Zealand is calculated to be the equivalent of a human population of 250-300 million.
- Cattle alone produce an estimated 241,250 tonnes of dung each day from 135 million cattle pads.
- Dairy and beef cattle dung pads cover up to 870 ha of pasture each day
- Dung can remain on pasture for 2-4 months and 5% of pasture can be affected at any one time.
- Leaving a cattle dung pad on pasture for 15 days kills 75% of grass tillers under the patch.
- Up to 80% of nitrogen can be lost through evaporation.
- Pasture surrounding dung pads is rejected by stock. After three grazings dung affected herbage is still 2.5 times higher than surrounding pasture.

Dung beetles

- Only feed on dung
- Don’t feed on plant roots
- Don’t enter the bush where our native dung beetles live
- Increase earthworm numbers by making dung available deep in the soil in the summer months

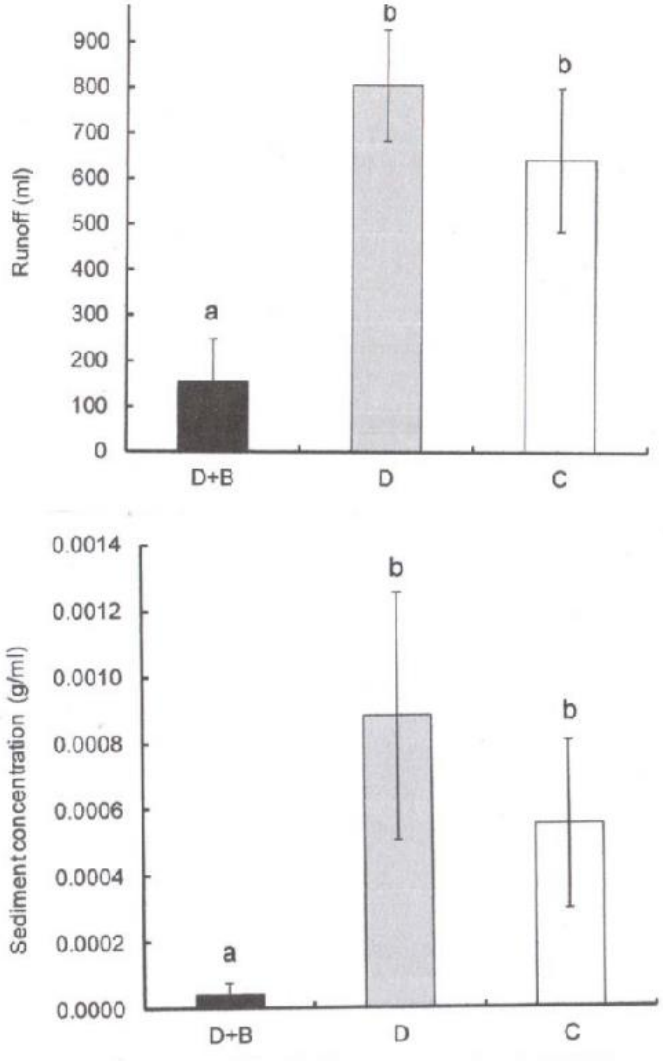
Dung beetle life cycle



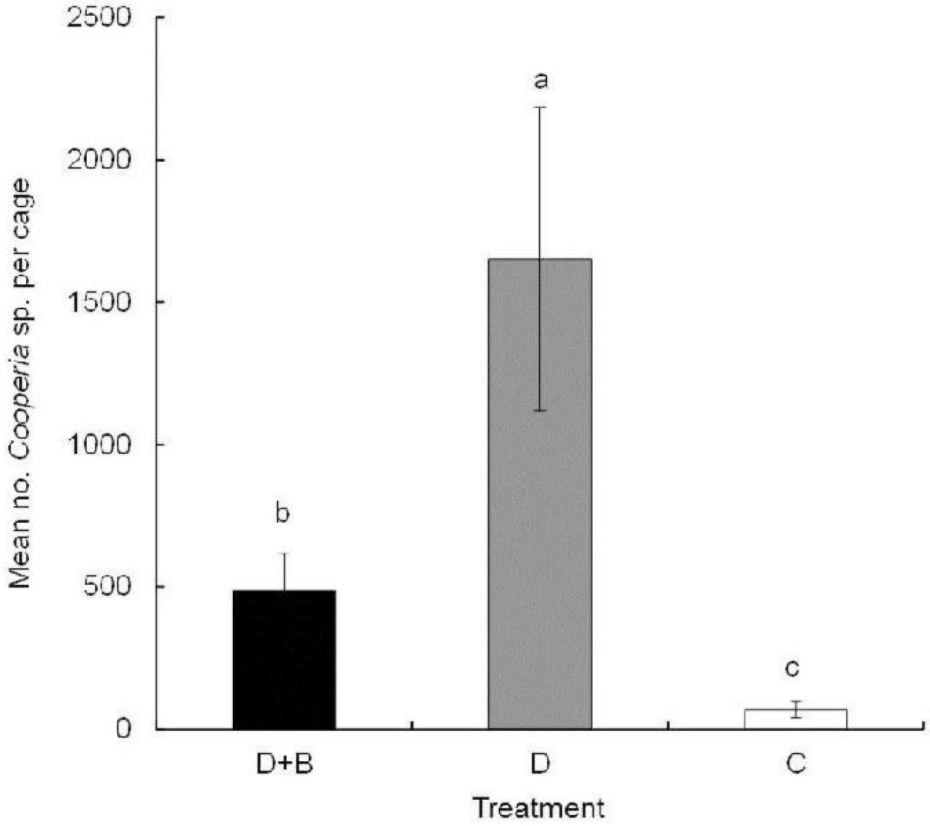
Benefits of dung beetles

- reduction in the area of pasture covered by dung
- decrease in parasitic worm load on pasture by 80-90%
- reduction in parasitic worm ingestion
- increase in nutrient cycling
- reduction in nitrogen loss from dung
- increase in water penetration and retention
- improvement in soil aeration
- reduction in fly numbers
- reduction in faecal contamination of waterways

Reduced water and sediment runoff



Effect on nematodes



Releases of dung beetles in Northland

1) *Digitonthophagus gazella* – Rangiputa Station
   100 beetles – 22 Jan 2014
2) *Onthophagus binodis* – Paranui Rd
   200 beetles 13 March 2014
   500 beetles 15 March 2016
3) *Onthophagus binodis* –
   Otangaroa 250 beetles
   20 March 2014
4) *Geotrupes spiniger* –
   Rangiputa 200 beetles
   28 March 2015

Frequently asked Questions

Q How will dung beetles affect native dung beetles?

A Native dung beetle live in the forest, exotic dung beetles live in pasture

Q How will they affect Earthworms?

A Make dung available to earthworm especially in summer

Q Will they transmit disease?

A The Ministry of Health commissioned the Institute of Environmental Science and Research (ESR) to undertake a human health risk assessment.

"Essentially our findings agree with the public health adage that it is better to bury faeces than leave them on the surface." Bury dung out of reach of flies which can spread human diseases

Q What drenches are compatible?

A Harmful = most macrocyclic lactones (MLs) particularly for the first 1-2 weeks after application. Eg. abamectin, ivermectin

DB friendly = moxidectins, (also part of the ML family), clear drenches (Levamisoles), white drenches (Benzimidazoles).


WELCOME TO THE DUNG BEETLE CAFÉ. TODAY'S CATCH OF THE DAY IS - UHH... LOOKS LIKE ZEBRA.
SCOTT HILBURN