Tukipo results

HAWKES BAY REGIONAL COUNCIL
TE KAUNIHERA Ā-ROHE O TE MATAU-A-MĀUI
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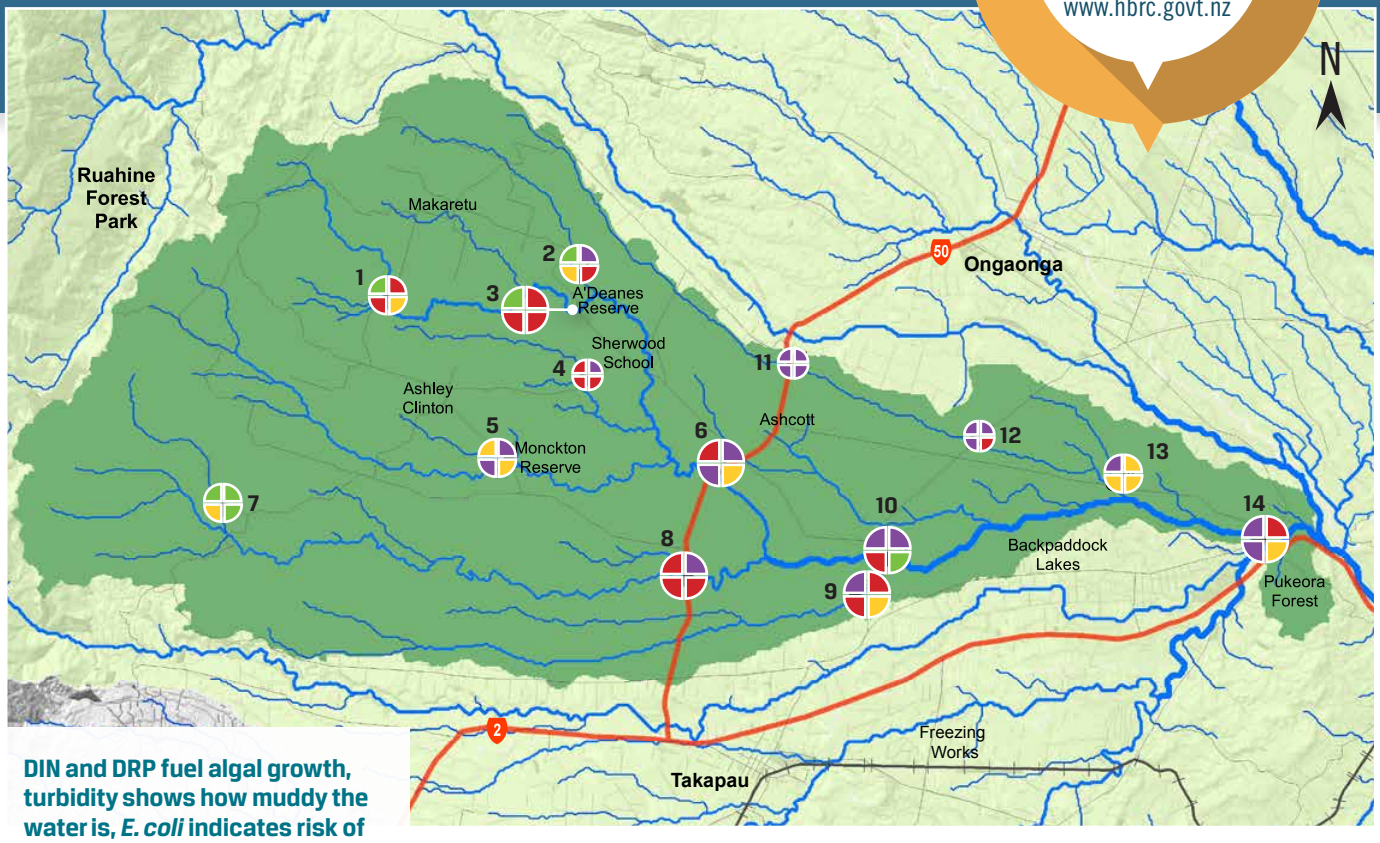


DIN and DRP fuel algal growth, turbidity shows how muddy the water is, *E. coli* indicates risk of pathogenic infection

Flow < 100 1/s
Flow 100-500 1/s
Flow > 500 1/s

N P
Sed Faecal

Indicator	Measure	Unit	Statistic	Good	Warning	Bad	Extreme
Nitrogen	Dissolved Inorganic Nitrogen	mg/l	Mean	<0.64	0.64 - 0.8	0.8 - 1.6	>1.6
Phosphorus	Dissolved Reactive Phosphorus	mg/l	Mean	<0.012	0.012 - 0.015	0.015 - 0.03	>0.03
Sediment	Turbidity	NTU	Median	<0.9	0.9 - 4.1	4.1 - 8.2	>8.2
Faecal	*Escherischia coli*	cfu/100ml	Median	<130	130 - 260	260 - 540	>540

cfu = colony forming units NTU = nephelometric turbidity units

SITE	NITROGEN	PHOSPHORUS	SEDIMENT	FAECAL	FLOW	SAMPLES
1. Tukipo River at Clinton-Makaretu Rd	0.314	0.026	5.53	205	266	8
2. Avoca River at Barnsdale Farm	0.583	0.075	3.20	365	121	8
3. Tukipo Stream DS Scenic Reserve	0.511	0.020	6.87	430	506	8
4. Parikaka Stream at Mill Rd	1.523	0.047	6.00	290	91	8
5. Tangarewai Stream at Ashley Clinton Rd	0.778	0.033	9.71	205	468	8
6. Tukipo River at SH 50	1.178	0.033	12.30	235	865	8
7. North Branch Mangatewai River at Crump Rd	0.337	0.008	1.89	76	300	8
8. Mangatewai Stream at SH 50	1.093	0.071	4.35	405	982	8
9. Mangapohio Stream at Burnside Rd Track	8.084	0.019	5.08	260	564	6
10. Tukipo River at Burnside Rd bridge	2.455	0.031	6.80	80	2378	8
11. Unnamed tributary at SH 50	3.070	0.033	9.50	1000	93	6
12. Unnamed tributary at Burnside Rd	2.957	0.035	10.00	420	37	5
13. Unnamed tributary at Ashcott Rd	5.171	0.013	2.80	190	295	8
14. Tukipo River u/s Makaretu River	2.500	0.024	13.50	150	4516	7

Sampling undertaken 2018/19. u/s = upstream

For more information contact one of our catchment advisors at the HBRC Waipawa office on 0800 108 838

What's going on
Tukipo sub-catchment?

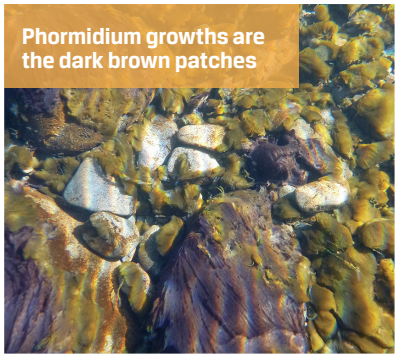
Above: Tukipo River at Burnside Road. Below: Mangatewai River at Crump Road.

The Tukipo is a sub-catchment of the Tukituki, and covers about 22,000 hectares.

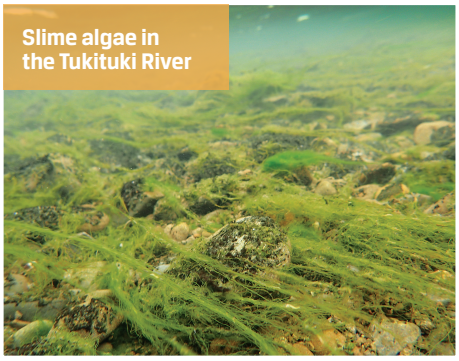
There are over 70 properties in the Tukipo subcatchment over 4 hectares in size. Farming is mainly sheep and beef, but there are also many dairy farms and a small number of deer and cropping operations.

Human activity has substantially altered the landscape in the Tukipo, but much of the original forests were devastated by severe gales 700 years ago. Further forest clearance occurred with European settlement, focusing on areas downstream of SH50 before spreading to areas upstream of SH50. Many riparian areas are in a poor state, with 47% of small streams having fair to poor vegetation quality, and 44% of stream edges having moderate to high disturbance from stock.

Long term water quality monitoring has shown that dissolved inorganic nitrogen (DIN) and dissolved reactive phosphorus (DRP) fail to meet targets set out in the Tukituki Plan. These two nutrients help fuel excessive algae and phormidium growth, causing problems in the Tukituki River.



Phormidium growths are the dark brown patches



Slime algae in the Tukituki River

The Regional Council has carried out a targeted monitoring programme across 14 sites to identify water quality patterns and help identify solutions.

This was a short term investigation to understand water quality patterns in greater detail, but may be repeated again in future.

What did we find?

All but 1 site had problem levels of at least 1 of the 4 main contaminants of concern.

There were 6 sites with nitrogen levels more than twice the DIN target, and 8 sites with phosphorus levels more than twice the DRP target. Sediment levels were consistently high across the subcatchment, and there was evidence of problematic faecal contamination at 6 sites.

In general, nitrogen was a bigger problem at more downstream sites where the countryside is flatter. Phosphorus, sediment and faecal contamination was a problem at different sites throughout the subcatchment, including more hilly as well as the flatter areas.

This snapshot investigation was undertaken during a comparatively wet period. The results should not be compared with other snapshot subcatchment investigations, because conditions may not be comparable and make the comparison unfair.

The results, however, are quite clear. A lot of work is needed to improve water quality and riparian health in the Tukipo subcatchment.

The long-term water quality compliance monitoring site for this subcatchment is the Tukipo River u/s Makaretu River.

What can you do to improve the water quality in this

Your tailored Farm Plan will identify approaches to reduce nutrient and sediment loss on your property.

Some common solutions include:

Managing Critical Source Areas

Anywhere with exposed soil is likely to be a 'critical source area'. Most of sediment and phosphorus losses (around 80%) come from a small part of the landscape (around 20%). They may include areas of erosion, stockyards, tracks, races and intensively grazed areas. Critical source areas should be targeted as a priority and their impact can be reduced through improved management techniques.

Riparian management and stock exclusion

Stock exclusion will contribute to improving stream health. Riparian areas along the Tukipo showed plenty of room for improvement, with 44% of small streams having moderate to highly disturbed banks*.

Wide buffer areas near streams and substantial planting will benefit these waterways by reducing phosphorus, sediment and bacteria levels.

*Riparian assessments were based on imagery from 2013/14.

Poor riparian habitat (right), and below an example of good riparian planting.

The greatest threats to stream health are usually sediment and poor riparian management.

sub-catchment?

Reducing nutrient loss (Nitrogen and Phosphorus)

Test your soil before you fertilise it. Olsen-P is a measure of the more mobile fraction of applied phosphorus (P) that is readily available to plants. It is this type of P that is easily lost to water if not taken up by vegetation. Olsen-P should be maintained at an economic and productive optimum, a higher level indicates a risk of surplus P that could be lost to waterways. Test your soil before you fertilise it.

As the Olsen-P increases above 20 mg/kg, the risk of phosphorus loss to waterways increases sharply. So, if you don't need Olsen P to be above 20 mg/kg for production, then don't be. There may be no benefit to production, it costs you more, and there is a big cost to waterways.

- Avoid applying nutrients when plants are not actively growing (i.e. not between May and August), or when heavy rain is forecast
- Winter crops can account for half of your farm's annual nutrient losses - follow best practice guidelines to minimise losses from this critical source area
- Locate silage pits away from waterways
- All else being equal, more stock units = more risk of nutrients lost

Reducing sediment loss

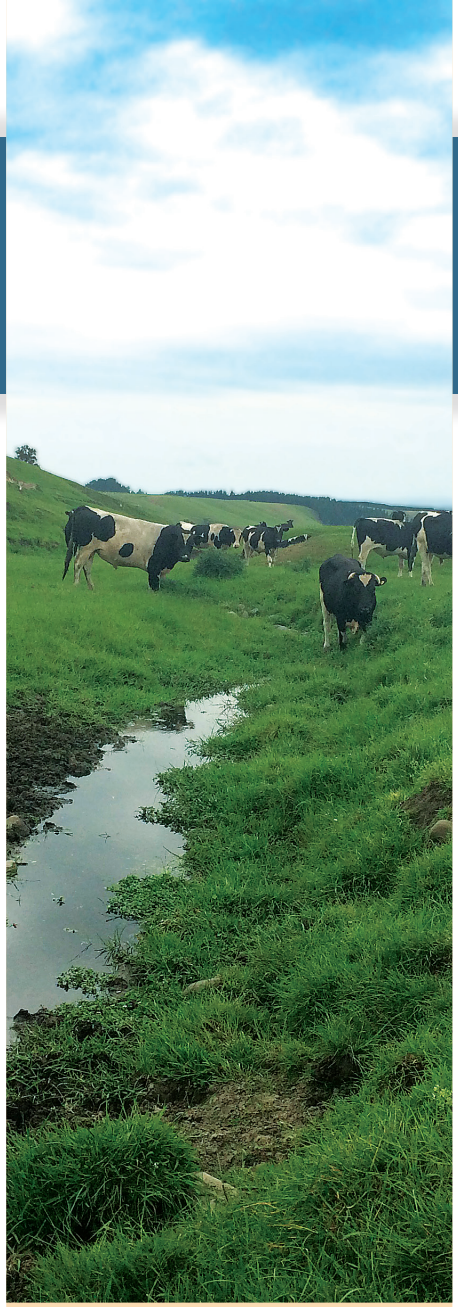
The greatest threats to stream health are usually sediment and poor riparian management.

- Exclude stock from waterways and plant along stream banks wherever practical
- Incorporate buffer strips - thick grass or other heavily vegetated areas - between waterways and tracks, lanes or any other sources of sediment such as worked paddocks or winter crops
- Discuss soil conservation techniques with your Regional Council Catchment Advisor or FEMP provider
- Do not position winter crops near waterways or on steep hills
- Cultivate along the contour, not downhill

Reducing faecal contamination *(E. coli)*

***E. coli* in water is an indicator of bacteria from excrement.**

- Prevent direct stock access to waterways wherever practical
- Faeces is concentrated on tracks, races, laneways, stockyards and around woolsheds - manage these so runoff does not flow straight into a waterway
- Clean your septic tank regularly and ensure it does not receive storm water
- Don't put offal pits near waterways



Stock exclusion (not happening above) and pole planting (below) are two ways to help improve water quality.