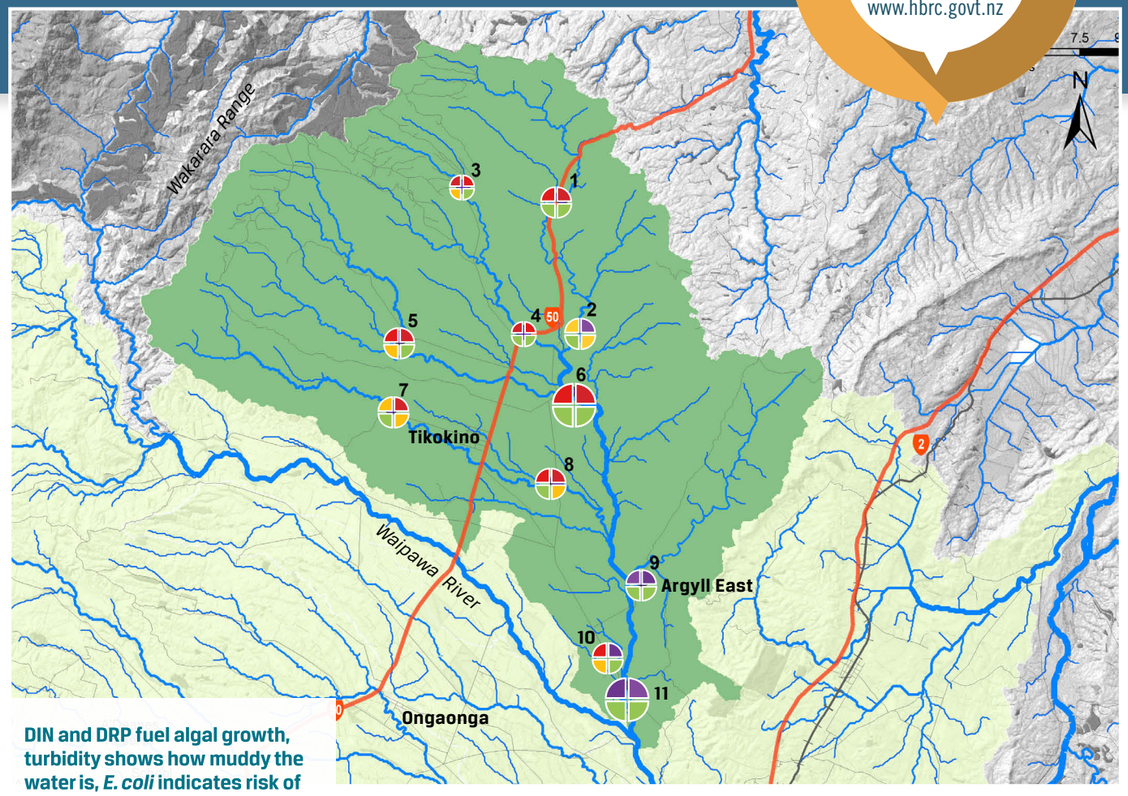
Mangaonuku results



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

Flow ⟨ 100 l/s
Flow 100-500 l/s
Flow ⟩ 500 l/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	⟨0.008	0.008 - 0.010	0.010 - 0.02	⟩0.02
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. Mangaonuku Stream at Highway 50 Site 2	0.89	0.018	0.60	110	104	7
2. Mangaonuku Stream at Shed Access	0.68	0.025	0.60	220	312	7
3. Mangamate Stream at Downstream of Weir	1.00	0.012	1.38	30	40	7
4. Mangamate Stream at State Highway 50	1.45	0.018	0.23	70	31	7
5. Opokararo Stream at Matheson Rd	1.40	0.016	1.16	20	119	6
6. Mangaonuku Stream D/S Mangamauku	1.14	0.019	0.63	30	632	7
7. Mangaoho Stream at Holden Road	0.66	0.011	0.73	130	159	7
8. Mangaoho Stream at Butler Road	1.60	0.011	0.60	160	148	7
9. Mangaonuku Trib at The Brow Rd Br 8029290	2.09	0.029	0.56	90	367	6
10. Mangaonuku Trib at Tributary 19	1.10	0.067	1.09	90	189	7
11. Mangaonuku Stream at Waipawa Tikokino Rd	2.00	0.025	0.58	80	1797	7

Sampling undertaken 2019/20. u/s = upstream

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

Mangaonuku

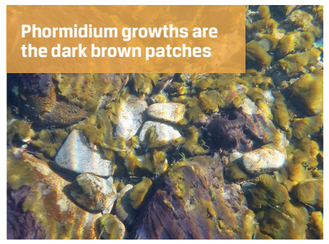
What's going on Mangaonuku sub-catchment?

The Mangaonuku is one of 17 sub-catchments in the Tukituki catchment.

It starts in the foothills of the Wakarara Range and is fed from about 36,000 hectares before flowing into the Waipawa River. There are about 80 properties in the sub-catchment, mostly sheep and beef, along with small numbers of cropping, dairy, dairy support, deer, forestry, and vineyard.

Ongoing human activity has significantly altered the landscape. Tikokino (formerly known as Hampden) was a sawmilling centre when forests were being felled from the mid-19th century, and large areas of land were converted to pasture.

Riparian health is relatively good in comparison to other Tukituki sub-catchments, but survey work indicated 35% of stream edges had moderate to high disturbance. Long-term water quality monitoring shows dissolved organic nitrogen (DIN) and dissolved reactive phosphorus (DRP) fail to meet targets under the Tukituki Plan. These two nutrients help fuel excessive algae and phormidium growth, which cause problems in the Tukituki River.


Phormidium growths are the dark brown patches


Slime algae in the Tukituki River

What did we find?

All sites sampled had elevated levels of at least one of the four main contaminants of concern.

The phosphorus target was exceeded at all sites, and the nitrogen target was exceeded at all but two sites. The highest nitrogen and phosphorus levels were mainly recorded in the most downstream sites.

For most sites, neither sediment nor faecal contamination were at concerning levels. These results are based on limited data however, and further sampling would be needed to confidently assess water quality patterns.

The flow at site 6 (mainstem Mangaonuku half-way down sub-catchment) was only about a third of the flow at Waipawa-Tikokino Rd (most downstream site). Many springs emerge in the lower catchment, which means that water quality influences from properties in the upper catchment may not materialise in the streams until groundwater resurfaces at the bottom of the sub-catchment.

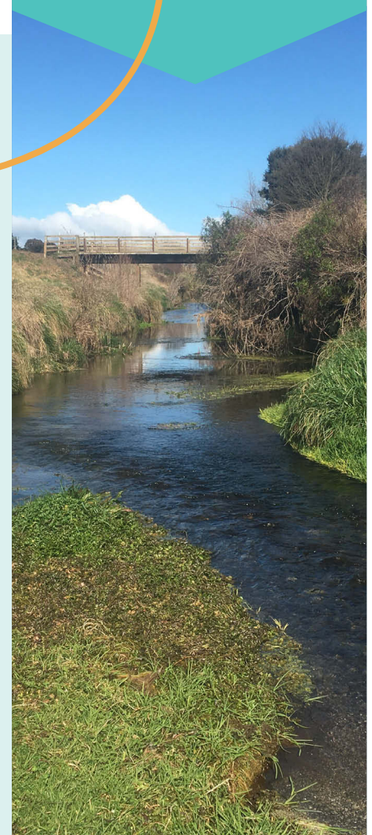
Overall, this investigation indicates nutrients are sourced from throughout the Mangaonuku sub-catchment, and farm plans for all properties will need to focus on nutrient reductions. There is plenty of scope for riparian improvements, and constructed wetlands may be a pragmatic option to help reduce nitrogen levels.

Going forward, the Mangaonuku Stream at Waipawa-Tikokino Rd will be the long-term water quality compliance monitoring site.

Above: Mangaonuku Stream at Tikokino Road. Below: Mangatahi Stream at The Brow Road.

The Regional Council has carried out a targeted monitoring programme across 11 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 can you do to improve the water quality in this sub-catchment?

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 Mangaonuku showed plenty of room for improvement, with 35% 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 (inset below), and an example of good riparian planting (main photo right).

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

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, don't raise Olsen P above 20 mg/kg unless it needs to 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
- Use Overseer to evaluate system changes that may reduce nitrogen losses
- Consider reducing stock numbers (all else being equal, more stock units = more risk of nutrients lost)
- Measure and improve irrigation efficiency

Reducing sediment loss

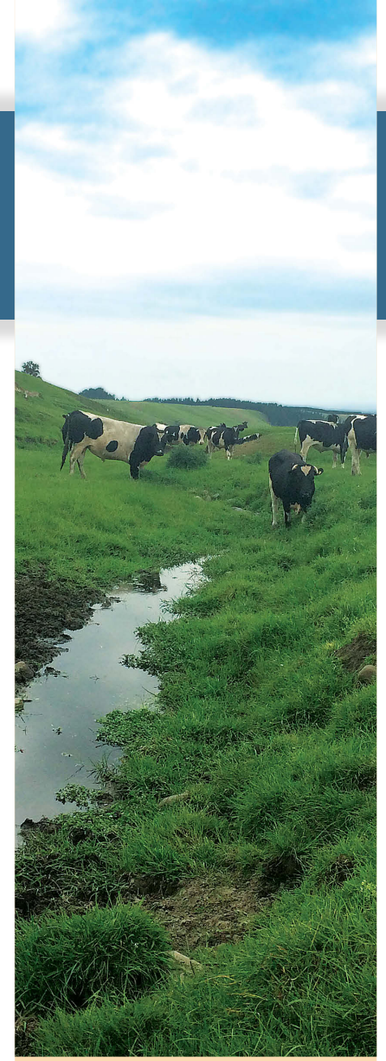
The greatest threats to stream health are usually sediment and poor riparian management.

- 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.