# Understanding Sediment

## Freshwater Consultation Document

June 2024



Taranaki Regional Council

The purpose of this document is to present information on sediment in Taranaki waterways to help you provide feedback that will be used by the Council to prepare targets, limits and actions to manage and protect freshwater.

This fact sheet is one of a suite of documents (listed below) that explore the specific water quality challenges facing the Taranaki region. The documents include analysis of the current state of play for each issue in the context of national standards as well as examining trends. They also discuss potential actions and responses to address the identified issues:

- Understanding Water Quantity and Water Allocation
- Understanding *E. Coli*
- Understanding Sediment
- Understanding Nutrients
- Understanding Earthworks and Land Disturbance
- Understanding Stormwater and Wastewater Discharges
- Understanding How Farm Practices can Help Water Quality
- Understanding Animal Effluent
- Understanding the Taranaki Economy

Throughout these documents we pose specific questions that we would like your feedback on. Look for the question mark to guide your responses.

## What we have heard so far

The information and options in this document reflect previous conversations with the community where we have heard not only what people value about freshwater, but also what outcomes they want to see. The results of our previous conversations with the community can be found on the Have Your Say section of our website: https://haveyoursay.trc.govt.nz/

## Working with iwi

Through the development of the proposed Land and Freshwater Plan, work has been ongoing with Nga Iwi o Taranaki Pou Taiao to understand and develop our knowledge of tangata whenua freshwater values. In developing the content of these fact sheets we have had regard to the information shared and discussed with us, and this is reflected in the management options presented. We will continue to work with Tangata Whenua to further refine approaches as the development of the proposed Plan continues.

## We want to hear from you

Responses can be made via our online survey at https://trc.govt.nz/helpshapetherules or by getting along to one of the 16 public meetings around the region. Meeting dates and locations are available online.

You can also respond in writing to the Council at 47 Cloten Road, Stratford or email us at policy@trc.govt.nz.



**This phase of community consultation begins on Monday, 10 June and ends Friday, 2 August.**

There will be additional opportunities to engage on the proposed Plan as we move toward Plan notification in mid-2025. See the timeline in the next steps section of this document for further details.

## Want to know more?

The information contained in this fact sheet is informed by the Council's scientific investigations into environmental issues affecting the region's freshwater including sediment, *E. coli*, nutrients, and water allocation. The technical memorandums and supporting materials are available on the Council's website at https://trc.govt.nz/helpshapetherules.

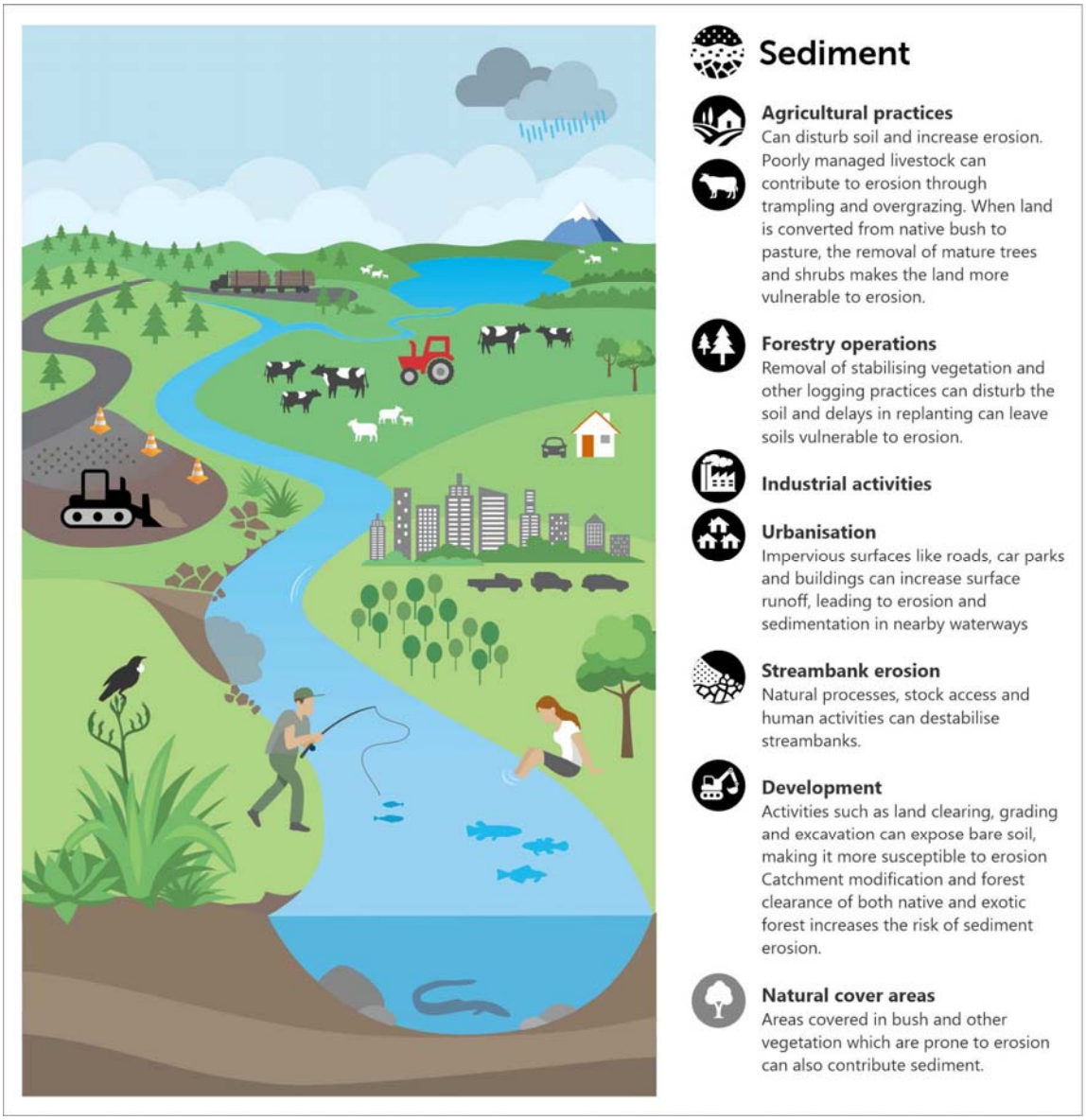
## What is sediment?

Sediment is soil, sand or gravel that has entered waterways as a result of erosion.

We have two monitoring programmes for sediment: one looking at suspended fine sediment and another for deposited sediment.

Suspended fine sediment refers to the fine particles of sediment being carried by water. If a stream is affected by high levels of suspended fine sediment, it will generally look muddy and brown. Suspended fine sediment is measured by looking at the visual clarity, or how much light penetrates through the water. Deposited sediment is assessed in wadeable, naturally hard or rocky bottomed streams. It is measured as the percentage of the stream-bed area covered with deposited fine sediment.

In excessive amounts, suspended fine sediment can negatively affect water quality and the health and wellbeing of aquatic ecosystems. Suspended fine sediment blocks sunlight from reaching plants and algae, and once deposited, sediment smothers habitat for freshwater life when it settles on the bed of lakes or streams.



# Monitoring for suspended sediment

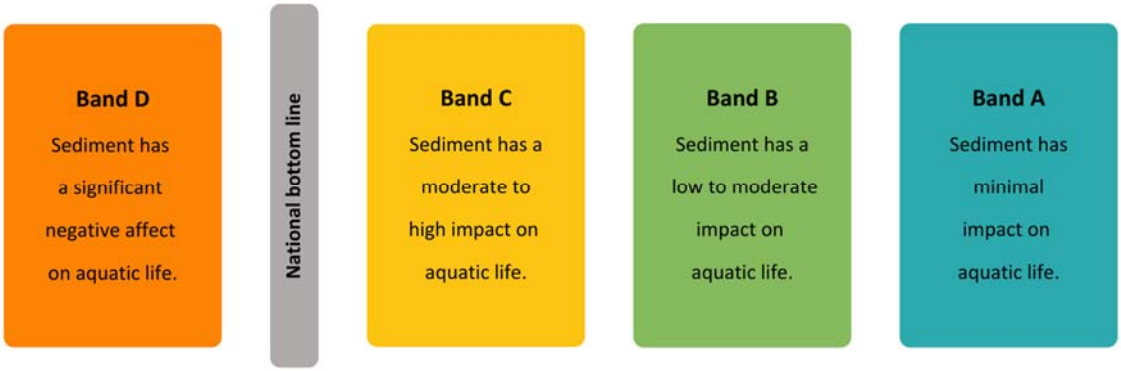
We monitor and assess sediment in our rivers at 22 sites across the region, assigning a grade based on the data collected over many years. In some instances, the Council has been monitoring for over 25 years. The grades for sediment range from band D, where the impact on aquatic life is significant, to band A, where sediment has minimal effect on aquatic life.

The Government has identified a minimum standard, known as the national bottom line, for sediment and its implication on water quality.

Regional councils are directed by the Government to work with communities to improve the state of suspended sediment and set targets for freshwater quality in the region. Currently, eight sites across the region are below the minimum standard for suspended sediment.

You have told us your aspirations are for better quality water in our rivers and streams, and we are considering the opportunities and challenges to improve degraded water quality across the region and where targets can be set to improve water quality.

However, this is no small feat and will require a long-term approach with smaller targets along the way to map progress.






## Draft targets for Taranaki

This table shows the draft targets for visual clarity at the region's monitoring sites. In setting targets, we are looking to strike the right balance between being ambitious and achievable.

Where sites are achieving band A, we are aiming to maintain this standard. For sites not achieving band A, targets have been set to gradually improve over the next 30 years where possible.

The baseline state is the starting point to begin the target setting process and is the yardstick against which we measure future progress.

The road to improving water quality in Taranaki first requires preventing further degradation. We therefore need to think carefully about our first steps and what that might look like, as well as considering the time it might take before we see the improvements.

| Site name | Baseline state | Draft target 2035 | Draft target 2045 | Draft target 2055 |
|---|---|---|---|---|
| Whenuakura River at Nicholson Road | D | D | D | D |
| Tawhiti Stream at Duffy's | D | D | D | D |
| Mangaehu River at Raupuha Road bridge | D | D | D | C |
| Makuri Stream downstream of Raupuha Road | A | A | A | A |
| Pātea River at Skinner Road bridge | A | A | A | A |
| Pātea River at Barclay Road bridge | A | A | A | A |
| Waingongoro River at State Highway 45 | D | C | B | B |
| Waingongoro River at Eltham Road bridge | A | A | A | A |
| Waiokura Stream at Manaia Golf Course | D | D | D | D |
| Waiokura Stream at Skeet Road | D | D | D | D |
| Pūnehu Stream at State Highway 45 | C | C | C | B |
| Pūnehu Stream at Wiremu Road | A | A | A | A |
| Kapoaiaia Stream at Cape Egmont | A | A | A | A |
| Hangahatua (Stony) River at Mangatētē Road | A | A | A | A |
| Waiwhakaiho River at State Highway 3 | A | A | A | A |
| Mangaoraka Stream at Corbett Road | A | A | A | A |
| Manganui River upstream of SH3 | A | A | A | A |
| Matau Stream upstream of unnamed tributary | A | A | A | A |
| Waitara River at Bertrand Road | D | D | D | D |
| Waitara River adjacent to Autawa Road | D | D | D | D |
| Maketawa Stream at Tarata Road | A | A | A | A |
| Waikaramarama Stream at Waikaramarama Road | A | A | A | A |



*To what extent do you agree with the draft targets for improving suspended fine sediment by 2055?*

## Reductions required

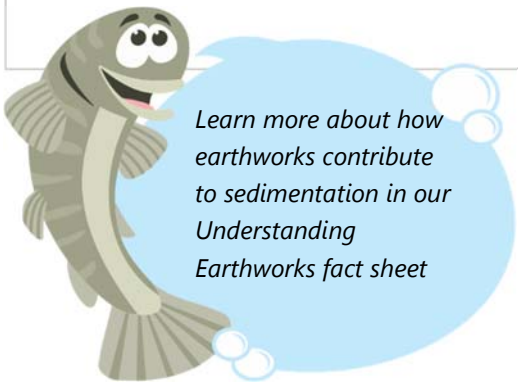
Seven out of the 22 monitoring sites need to reduce sediment loads by 15% - 64% just to achieve the national bottom line. To improve sediment loads to achieve band B and band A, even larger reductions are required.

Reductions ranging from 11% to 15% are required at three additional sites to improve beyond band C and band B, while the remaining 13 sites are already in Band A. The effects of climate change are expected to make these reductions even more challenging.

Even where sites may be at acceptable levels, additional actions may be required to maintain those levels.



*Rural landowners across the region have long worked with the Council to improve environmental outcomes and reduce the impacts of land use on freshwater*



*Learn more about how earthworks contribute to sedimentation in our Understanding Earthworks fact sheet*

# How far will current practice take us?

Through the process of setting the draft targets, we looked at what can be achieved with our current programmes and considering how climate change may affect things in future.

Improvements at some sites will be possible with the completion of voluntary programmes. However to meet draft targets, additional load reductions are required at 13 sites beyond what can be achieved under the current approach (see the draft targets table earlier in the document).

At eight of these sites, sediment load is currently above the national bottom line. However, there will be between 6% to 30% additional sediment load reduction will be required by 2045 to maintain baseline state and avoid further degradation due to increased erosion risk with climate change.

There are also seven sites that are in band D where it will be unlikely that we can achieve the national bottom line by 2055.

## What is being done now?

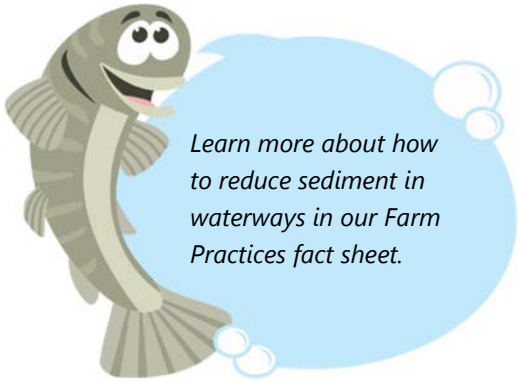
Rural landowners across the region have long worked with the Council to improve environmental outcomes and reduce the impacts of land use on freshwater.

The Sustainable Land Management Programme is a voluntary programme. It supports farmers to reduce soil loss and improve freshwater outcomes by providing:

- Comprehensive Farm Plans and Agroforestry Plans for the eastern hill country, characterised by steep hills which are prone to erosion.
- Riparian Management Plans for the ring plain surrounding Taranaki Maunga, where the most intensive dairy farming occurs.

### Comprehensive Farm Plans

Comprehensive Farm Plans provide a whole farm approach to sustainable land use in the hill country. The Plans address erosion risks on steep terrain to minimise soil loss and address other environmental impacts arising from farm activities. The Plans include soil conservation works consisting of a combination of scrub reversion on the steepest slope class and space-planted trees on other slope classes.




### Riparian fencing and planting

Fencing off waterways prevents stock from trampling the banks, helping to maintain the structure of the stream banks. It also allows vegetation to become established. Planting vegetation along stream margins has multiple benefits for improving water quality.

Riparian planting helps to stabilise banks and prevent erosion. Planting also helps to filter pollutants, including sediments and provides habitat for wildlife.

Since these voluntary programmes began, there has been a reduction in the amount of sediment entering the region's waterways.

## Where are our most challenging areas?

The eastern hill country experiences far more soil loss and sediment entering waterways than the plains surrounding Taranaki Maunga. Here, the steep slopes, geology and soil are vulnerable to erosion, which is exacerbated by high rainfall.

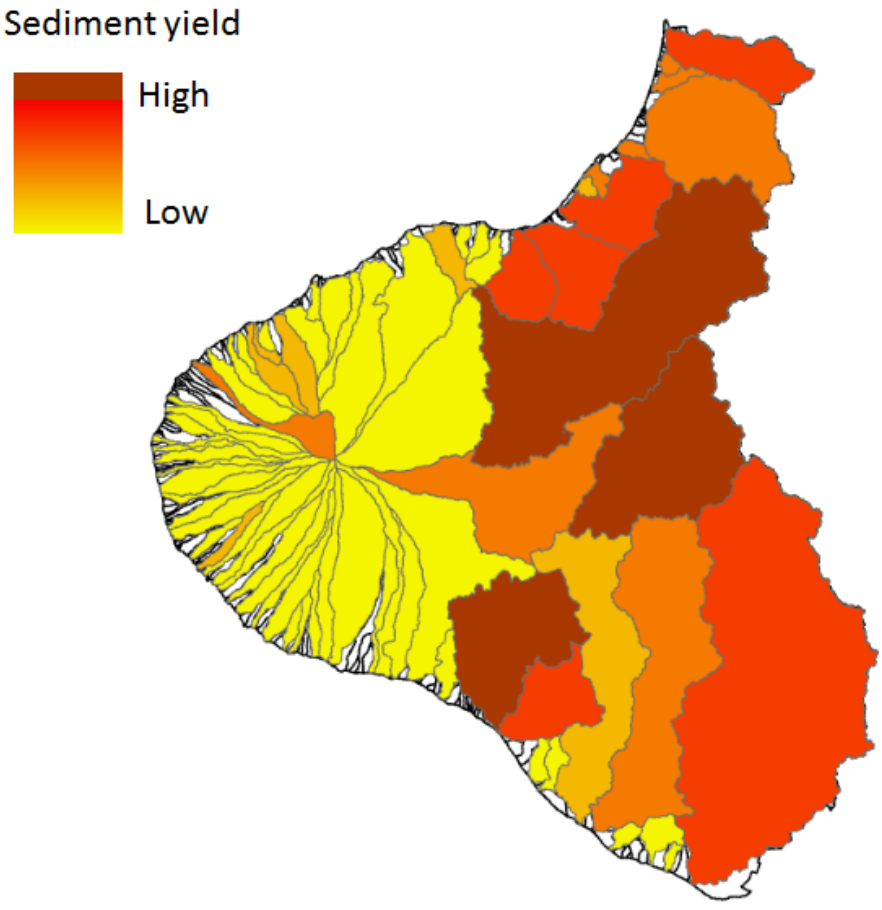
The map below shows the relative difference in estimated sediment loads in eastern hill country catchments compared to volcanic ring plain catchments. This has been illustrated in terms of 'yield' which accounts for differences in catchment size, allowing for direct comparison in sediment loads between catchments.

Despite general trends in sediment erosion being much greater in the hill country catchments, three out of the five monitoring sites which are below the national bottom line for visual clarity are located in ring plain catchments; highlighting the need to still reduce sediment loads in this part of the region as well.

In total, there are four sites in hill country catchments and two sites in ring plain catchments that are unlikely to achieve the national bottom line by 2055 (refer to target table on page five for specifics). This is because the required load reductions exceed what can realistically be achieved over that time frame.

Further reductions in suspended sediment can be achieved through a range of actions such as strategic management of critical source areas, use of sediment traps or retention ponds and bridging stock crossing points. We are keen to know what sorts of strategies farmers are implementing to reduce erosion and any challenges or limitations to implementing these actions more broadly.

We are also continuing to look into the additional opportunities for improving suspended sediment arising from land disturbance



# What else do we consider when setting the draft targets?

In addition to the matters already outlined above, we also consider the potential future impacts of climate change and the extent to which sedimentation is impacted by naturally occurring processes.



## Climate change

Predicting the effects that climate change will have on water quality in the future is challenging. Climate change will bring rising temperatures and increased variability in weather patterns to the Taranaki region, with varying effects on water quality.

There will likely be more frequent and intense rain events, which are expected to cause an increase in erosion and result in greater amounts of sediment washing into rivers, lakes and streams.

The effects of climate change in some locations will make achieving targets more difficult.

However, the progress made through the voluntary programmes – comprehensive farm plans and riparian fencing and planting - are estimated to offset some of the impacts of climate change, even under the most extreme scenarios modelled through the target setting process.




## Naturally occurring processes

Erosion is a natural process and we expect this to occur to some extent throughout the region. Trees help to prevent erosion in multiple ways, including; slowing surface runoff, their roots hold and bind soil together and the canopies of dense bush and native forest slow rain before reaching the ground.

While it is generally accepted that land modified from its natural state is more vulnerable to erosion, it is still possible for natural cover areas to contribute significant amounts of sediment to freshwater. This might be a result of steep hills, high rainfall and soil types.

Through the target setting process, we have identified areas of land that have not been modified by human use or activity, and calculated the proportion of sediment that these naturally contribute to freshwater.

Where a site is found to be significantly affected by sediment from a natural source, the draft target has been set to recognise the naturally high levels of sediment. However, where it can be managed, we must still work towards reducing excess sediment from entering waterways.

There is one site on the Whenuakura River, and one site on the Waitara River at Bertrand Road, where we do not expect to see improvements beyond band D due to the contribution of sediment from unmodified parts of the catchment.

In this catchment, even if all of the manageable sources were eliminated, the amount of sediment erosion occurring in unmodified areas would still prevent the national bottom line from being achieved.

# The science on suspended fine sediment

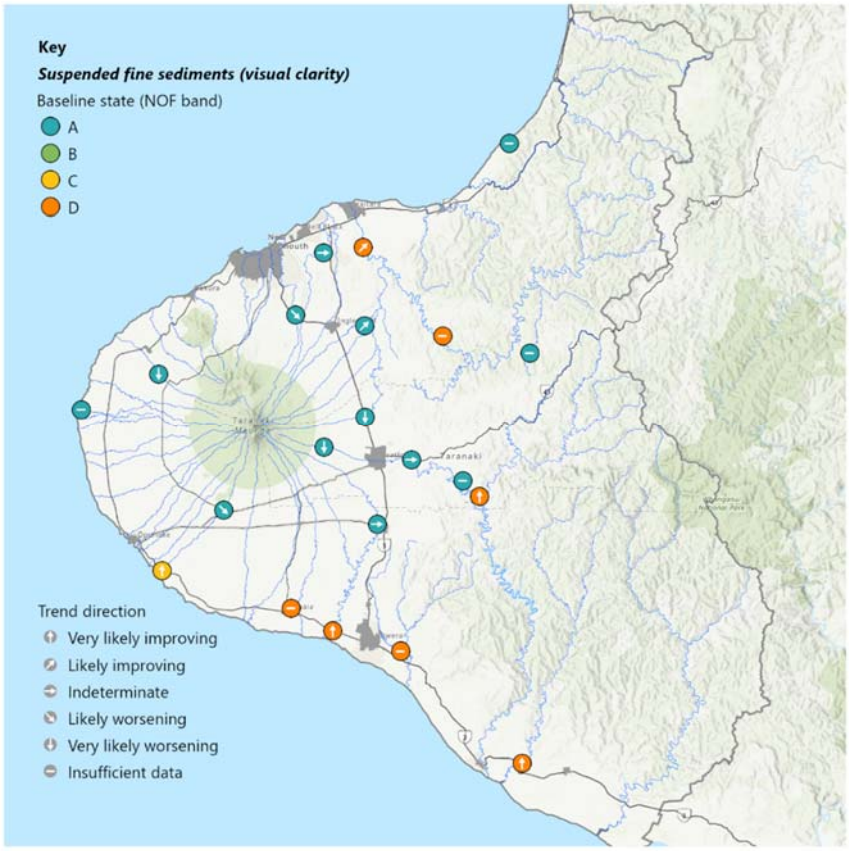
## Baseline state: Where we were

The baseline state at 13 sites monitored for suspended sediment achieve band A. At these sites, suspended sediment has minimal impact on water quality and aquatic life. There is one site that is graded band C.

The remaining 8 sites are graded band D and do not meet the minimum standards for water quality; suspended sediments are likely to have a significant impact on aquatic life.

## Trends: Where are we going

There are 14 sites across the region where the Council has carried out monitoring for long enough to calculate whether visual clarity is getting better or worse over time. At five of these sites, it is likely water quality is getting worse. At three sites, water quality remains reasonably stable. At five sites the water quality is likely improving.



## Next steps

Conversations with the community will help us set targets for sediment, which over time will help improve freshwater quality in the region's freshwater.

Feedback you provide through this process ultimately helps shape the rules that the Council will put in place to protect and manage freshwater. The rules will appear in the Proposed Land and Freshwater Plan (Proposed Plan) that will replace the region's Current Freshwater Plan (Current Plan) which is more than 20 years old.

Next steps for the Council are:

- Continue to develop the science on sediment, nutrients, *E. coli*, effluent and a range of other measures of water health as well as the potential options to manage these challenges
- Use your feedback on proposed targets to help shape rules that apply to sediment in the Proposed Plan.
- Work toward further community engagement on refined policy options and additional science.

## We want to hear from you



There are many ways that you can share your views with us:

Join us at one of 16 **community meetings** around the region. Meeting dates and locations are available online.

You can also **write to us**: Policy Manager, Freshwater Consultation, Taranaki Regional Council, 47 Cloten Road, Stratford.

**Email us** at policy@trc.govt.nz

Take our **online survey** at https://trc.govt.nz/helpshapetherules

## Timeline

**Jan 2021–Sept 2022**
**Understanding the story so far**
Collating the story of what's happening with Taranaki freshwater to inform conversation with the community, special interest groups and iwi.

**Apr 2021–Dec 2022**
**Vision, values and FMUs**
A chance for people across Taranaki to give their feedback on the region's draft FMUs, the visions that will establish the long-term goals for those units and the values which apply to them.

**2023**
**Te Mana o te Wai**
Exploring how Te Mana o te Wai can be applied in Taranaki and how our planning framework can improve the way that tangata whenua and communities are involved in freshwater management decisions.

**Sept–Oct 2023**
**Freshwater outcomes and change drivers**
Closing the loop on what we learned with our engagement so far and what it will mean for how we go forward with improving the quality of our water, the timelines and where the pinch points might be.

**June–July 2024**
**Setting targets**
Exploring potential targets for key areas linked to improving water quality.

**Nov–Dec 2024**
**Limits**
Exploring the potential rules that may be introduced through the proposed Land and Freshwater Plan to drive the change to achieve the targets we set for freshwater.

**Feb–April 2025**
**Feedback on Draft Plan**
Iwi, special interest groups and stakeholder engagement and feedback on the draft Land and Freshwater Plan.

**Mid 2025**
**Plans notification**
The Land and Freshwater Plan will be publicly notified prior to a formal submissions and hearing process.




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