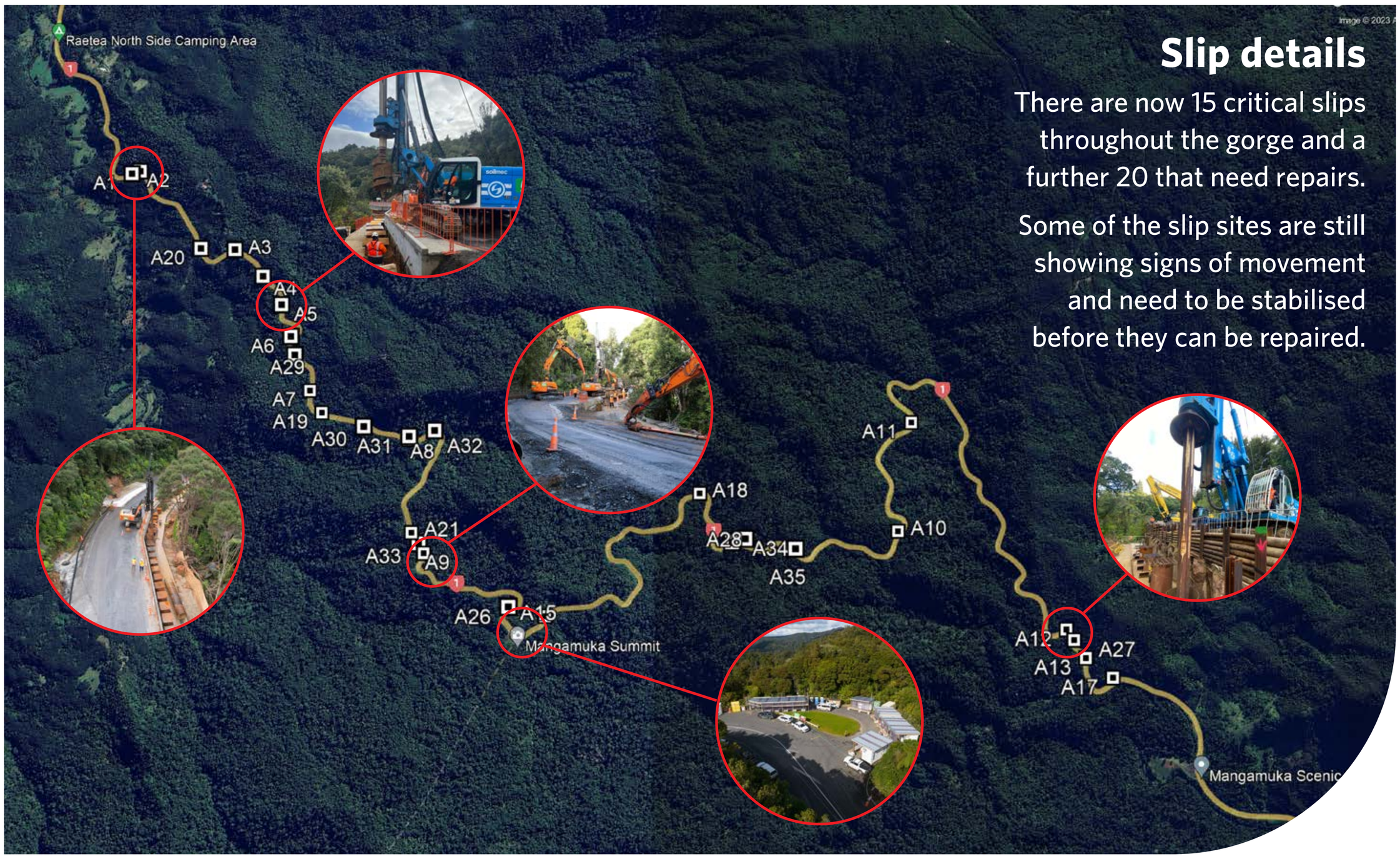
Project update

1 Mangamuka Gorge slip repairs



Slip details

There are now 15 critical slips throughout the gorge and a further 20 that need repairs.

Some of the slip sites are still showing signs of movement and need to be stabilised before they can be repaired.

Project timeline

August 2022

15 major and complex slips resulted in State Highway 1 (SH1) through Mangamuka Gorge closing.

August – November 2022

Geotechnical investigations were carried out to give us a better understanding of clearer picture of the full extent of the damage and ground conditions within the gorge.

December 2022

$100m of funding was secured to restore the state highway to its original condition.

Jan - late March 2023

Investigations, planning and design work is refined to understand the damage and how we will repair this challenging transport corridor.

February 2023 - late 2024

Slip repair work has begun and we've mobilised a full team to get started on site.

We are here

Late 2024

SH1 Mangamuka Gorge planned to reopen.

Stay in touch

Scan the QR code and enter your email address on our website to receive monthly progress updates.

For more information **email: northlandproject@nzta.govt.nz** or visit: **www.nzta.govt.nz/mangamuka**

Scan me

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Safety around a moving whenua

While we have been onsite, we have continued to experience ongoing weather events and a year's worth of rain in under 6 months. The wet weather has meant that at times it has been unsafe to be onsite, with several new slips occurring during this period.

We have a complex network of sensors onsite that are working non-stop to keep the construction site safe. These gadgets are constantly checking ground movement, helping geotechnical engineers know what's happening keeping the teams on site safe as they do the hard mahi fixing the slips.

The sensors monitor ground movement, check how wet the soil is, and measure how much rain has fallen. Every day, these sensors send data to a special plan that figures out how risky the ground movement is. This plan is called a Trigger Action Response Plan, or TARP. The TARP level is shown throughout the site with lights placed at slip entry points.

If it rains a lot (50mm or more in a day), or if the ground gets wet because it's been raining for a long time, the TARP level goes up automatically. If a sensor notices that the ground has moved sustainably since the last reading, alarms will go off and the crews are moved away from the site until it safe to return.

Sending data out from the gorge is tough because there's no cellphone coverage and power is limited. But the sensor system that keeps our teams safe uses advanced wireless technology to make this possible.

These smart sensors do an important job keeping everyone safe on site. They watch the ground and tell the engineers and workers if anything's not right, even if it's happening slowly or they can't see it right away.

Stormwater management

As part of our environmental controls we are continuing to take steps to ensure that wildlife and the land that they are on around the works sites are protected.

As part of this commitment, we are utilising innovative and effective ideas around managing water runoff to prevent contaminants from flowing off the worksite onto the whenua and awa below.

Water runoff is diverted into a series of clean industrial bins where dirt and other contaminants are allowed to settle, before overflowing into another bin. The remaining contaminants are also able to settle before being pumped out and removed offsite for further settlement and safe disposal.

Site facts and figures (as at September 2023)

119,527 **total hours worked** up to September and climbing

140 **people currently working on site** (daily average)

567 people **inducted on-site**

419 **locals working** on the project (74%)

747 enabling piles

242 permanent piles **scheduled to be installed** (currently)

3467m³ **concrete used** to date

more than **100km** **rebar required** (enough to get from Mangamuka to Whangarei)

14km Total distance of **rebar used to date** (140 rugby pitches)

1712mm
Historical average **annual rainfall**

1701.6mm
Total rainfall since March 2023

May
Wettest month to date **542.2mm**

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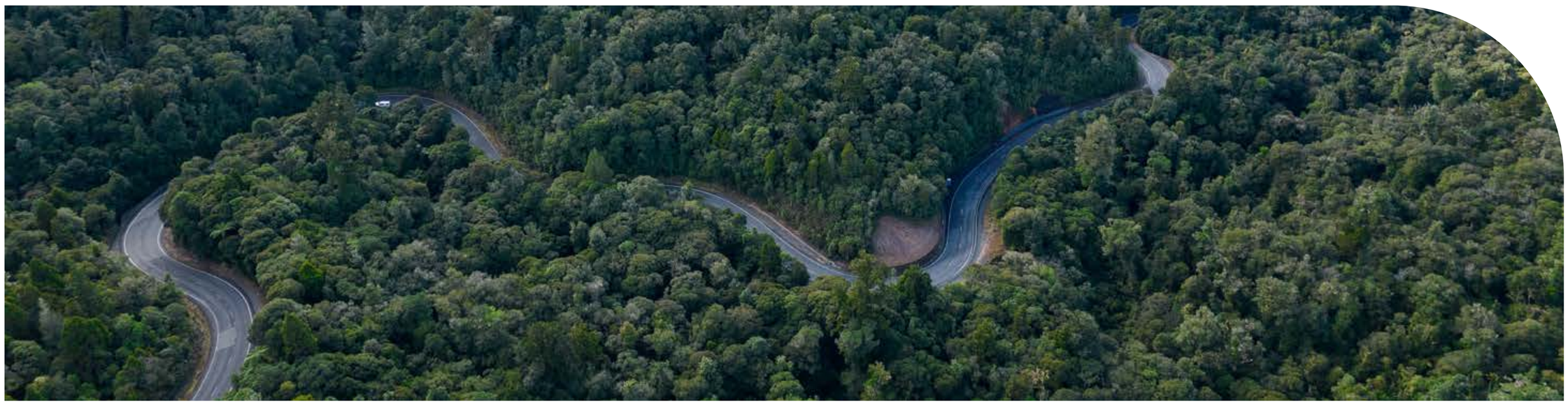


Uncovering what lies beneath

Northland's ground conditions have always been fragile and are unique to the rest of Aotearoa New Zealand. Almost 70% of the geological material which forms rocks in the region are made up of Northland Allochthon. It's better known as 'Northland Problematic Rock' as it has long been challenging for the construction and maintenance of roads.

Three severe weather events in 2022 completely saturated the surrounding Maungataniwha Ranges which triggered significant movement within the mountains. Additional weather events in 2023 have now resulted in 15 critical slips and a further 20 throughout the gorge that need repairs.

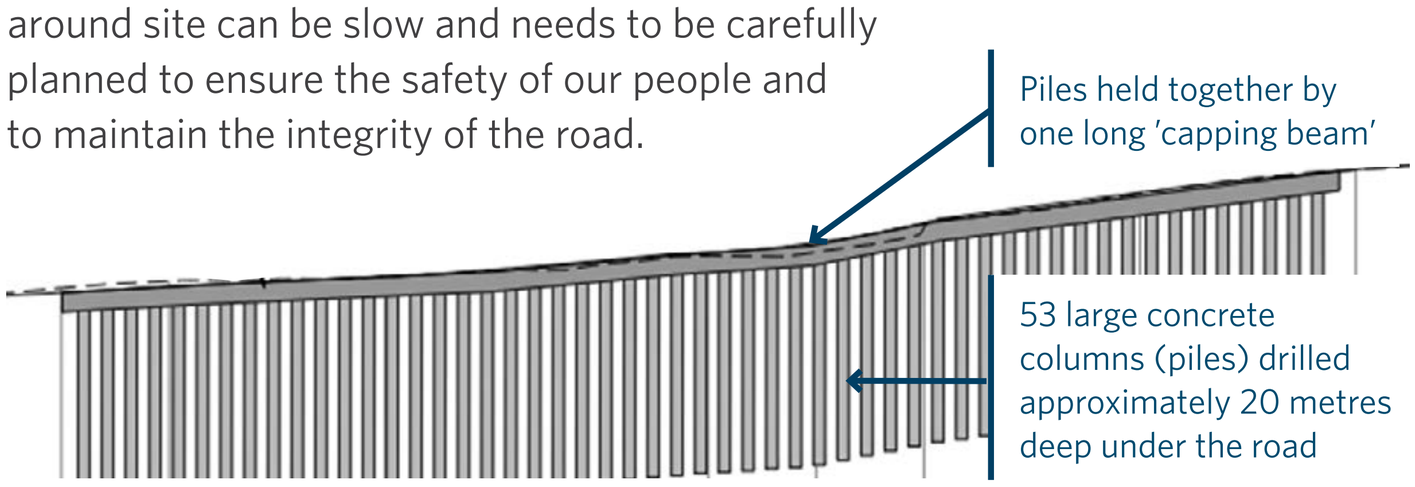
These slips require complex engineering solutions guided by as much geotechnical data as possible, as finding competent material to anchor the road to can be difficult.

How we will fix the slips

Here's an example of the repair plan for slip 9 which is one of the most significant slips on the northern end of the gorge. It's a complex fix and will take approximately 8 months to complete. Each slip requires a similar approach and will take on average 5-6 months each to repair.

This has been a complex process to understand firstly the damage which occurred and then investigate and plan the best way to fix each slip.

We're also working in a constrained environment with large machinery and a lot of people working across multiple sites. This means the movement of equipment and materials around site can be slow and needs to be carefully planned to ensure the safety of our people and to maintain the integrity of the road.



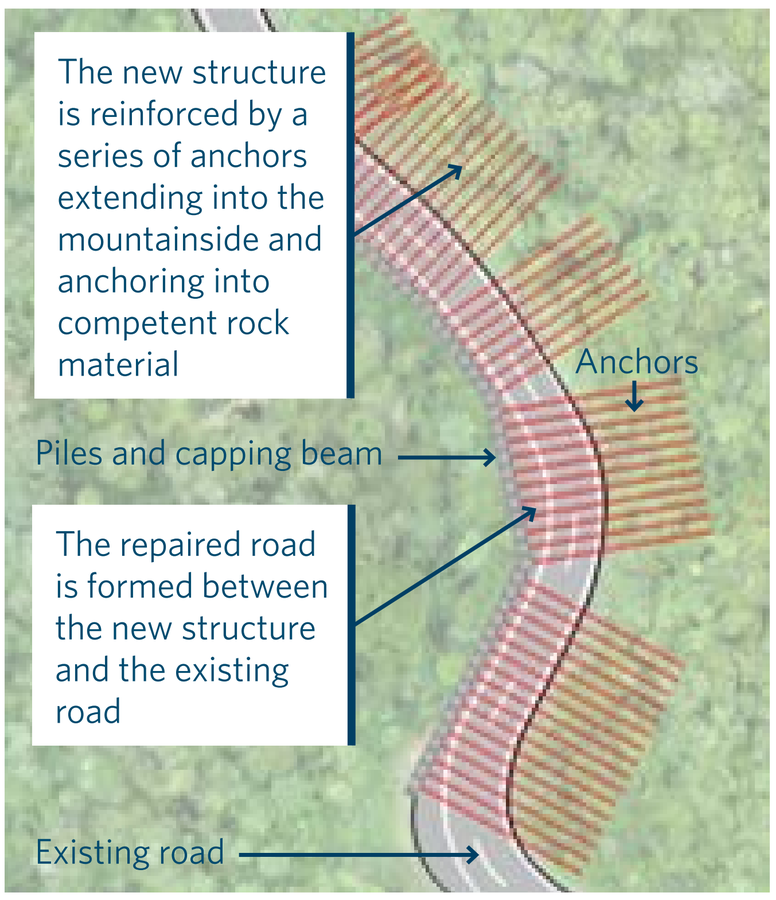
Partnering with iwi and hāpu

Waka Kotahi is committed to building strong relationships with our iwi and hapū partners. The adoption of Te Ara Kotahi, our Māori strategy provides direction on how we work with Māori as the Crown's Treaty partner to ensure mana whenua are supported as kaitiaki of their whenua.

A few of the ways we are partnering with iwi and hapū includes:

- Hapū representatives are part of the project team and work alongside Waka Kotahi.
- Hapū representatives are working together on cultural design outcomes.
- Cultural monitors representing iwi and hāpu from both the northern and southern end of the gorge have been monitoring work on site.

They have a consistent presence, focusing on the cultural, heritage and environmental aspects of the project.



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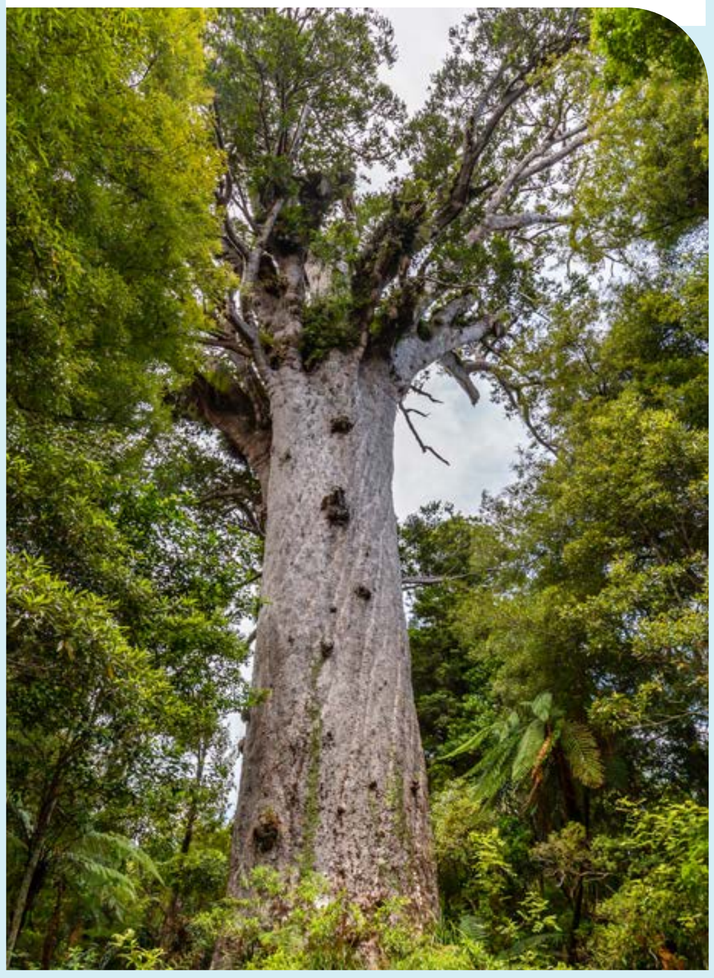
Caring for the environment

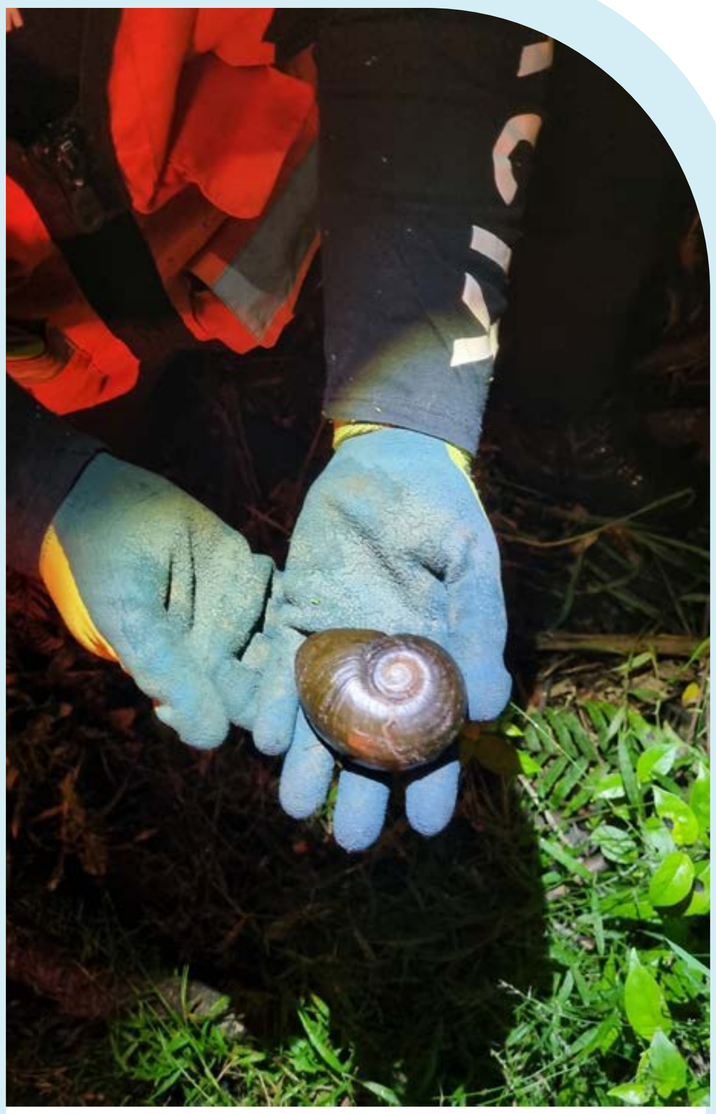
Protecting and enhancing the environment we're working in is critical to us and our partners as the Maungataniwha Ranges are home to a diverse range of native and endangered flora and fauna.

Effective stormwater and sediment management plays a major role in protecting the environment through construction. We're installing silt fencing, rainwater capture drains and sediment tanks to ensure any stormwater runoff is collected, diverted, and treated before it reaches the local waterways.

Kauri trees need to be protected from Kauri dieback disease – a fungus which damages the tree's root system and can kill it.

We have multiple cleaning stations within the gorge and our people are required to clean any footwear and equipment that may touch the ground before and after being on site. We've also got a plan for how we manage the safe movement of soil and vegetation into and out of our work sites.





We work closely with New Zealand Environmental Management and hapū to regularly survey any native or endangered species which may be at risk of impact by our work and relocate them away from our construction sites. We regularly move pupurangi (Kauri Snails) off the road and the construction sites and safely into the forest.

Local suppliers, local people

We know locals are keen to be involved in supporting the reopening of the Mangamuka Gorge for their whānau and friends. Where possible, we're focusing on using local providers and local people to carry out this crucial work.

This means that the person driving the digger, drilling the piles, or undertaking environmental checks could be from your community.

Having locals involved as part of the team has cultivated a culture of hard mahi and kotahitanga on site where everyone is working together for the good of the Far North community.