TUKUA NGĀ AWA KIA RERE

MAKING ROOM FOR RIVERS

A modern way to mitigate flood risk while supporting Aotearoa New Zealand's communities, climate, and wildlife.

A NATURE-BASED CLIMATE SOLUTION

Forest & Bird
TE REO O TE TAIAO | *Giving Nature a Voice*

INTRODUCTION

The Dutch revolutionised flood protection with the launch of their nature-based Room for the River programme 15 years ago, completing projects at more than 30 different locations across the Netherlands.

They gave rivers space to flood safely while restoring habitat for plants, fish, and birds. It was popular with local residents, and other countries followed suit, with similar projects in the US, the UK, and Australia, among others.

Here in Aotearoa, we still rely on hard engineering to "control" our rivers. We use diggers and bulldozers to straighten river channels then add stopbanks or rock groynes for stability, degrading our rivers in the process.

The aim is to drain floodwaters out to sea as quickly as possible, keeping them away from people. Although this might work for smaller floods, it can actually increase the risk during a major rainstorm (see illustration below).

Our flood mitigation schemes – covering 5% of the country – have given communities a false sense of security – that it's safe to build homes and businesses right up to the edges of rivers.

But the current approach isn't working. There has been a string of devastating floods across Aotearoa over the past five years, and many existing flood mitigation schemes need expensive upgrading to cope with heavier and more frequent rainstorms.

As the planet warms, more areas will become susceptible to flooding.

Altering the natural course of rivers has destroyed wetlands and habitat for birds, fish, and insects. It has degraded once-wild rivers, reduced te mana o te wai and mahinga kai opportunities, and diminished local swimming holes. However there is another way – a nature-based and climate-friendly way – that can make our communities more resilient to flooding while boosting biodiversity and restoring the mauri of our rivers.

A national conversation is starting about the multiple benefits of adopting the Room for the River approach, and at least one council is already trialling the idea, albeit on a small scale (see right). The government has recognised the value of nature-based solutions like this one in its response to climate change.

Young banded kōkopu. 📷 Nga Manu

Rivers with more room can accommodate bigger floods, naturally recharge groundwater, and provide more habitat for native species. They also become more accessible for people to explore and play.

Room for the River has a proven track record overseas. It's time to give rivers more room to roam in Aotearoa.

Kōtuku, Waitangiroto River, Westland

Flooding is the number one natural hazard in Aotearoa. New Zealand now faces, on average, one major flood event every eight months.

Te Uru Kahika Regional and Unitary Councils Aotearoa

MAKING ROOM FOR TE AWA KAIRANGI

One of the first local authorities in Aotearoa to embrace the room for rivers concept is Greater Wellington. Its RiverLink project combines flood protection, urban revitalisation, and improved transport links.

Te Awa Kairangi Hutt River flows through the heart of many communities and supports the Wellington region's economy and culture. It supplies half the water for Wellington, Hutt Valley, and Porirua, is popular for walking and swimming, and provides important habitat for native insects, fish, and birds.

But during the past century, homes and commercial properties have been built on the river's flood plain, narrowing its natural flow and degrading its health. Urban development has constrained the river, increasing flood risk and destroying natural wetlands.

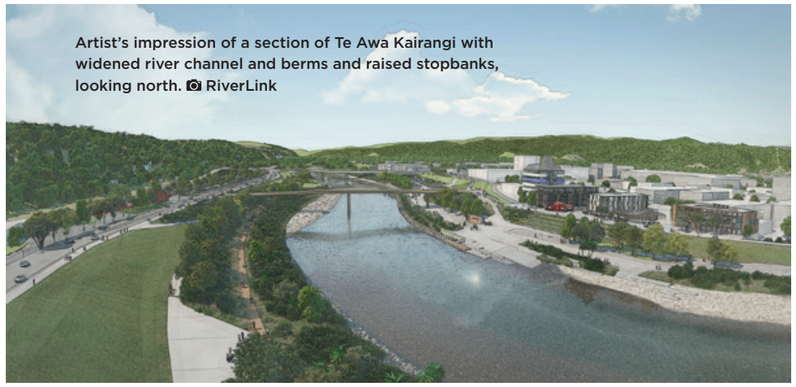
The council estimates a large flood could affect up to 3000 homes, five schools, and 600 businesses, with the potential to cause up to $1.1 billion worth of damage.

In 2023, it plans to widen a section of river that flows through Lower Hutt, giving it room to flow more naturally, reducing flooding risk, and making communities safer.

Widening the river will increase its ecological health by restoring its natural character, creating a mix of pools, riffles, and undercut banks that will provide great habitat for native fish, including tuna eels and īnanga whitebait.

There will also be wetland restoration along parts of the river corridor, providing homes for native species while filtering and slowing stormwater. The improved riverside parks will give more room for people to explore, play, and learn.

For more information about RiverLink, see **https://www.riverlink.co.nz**.



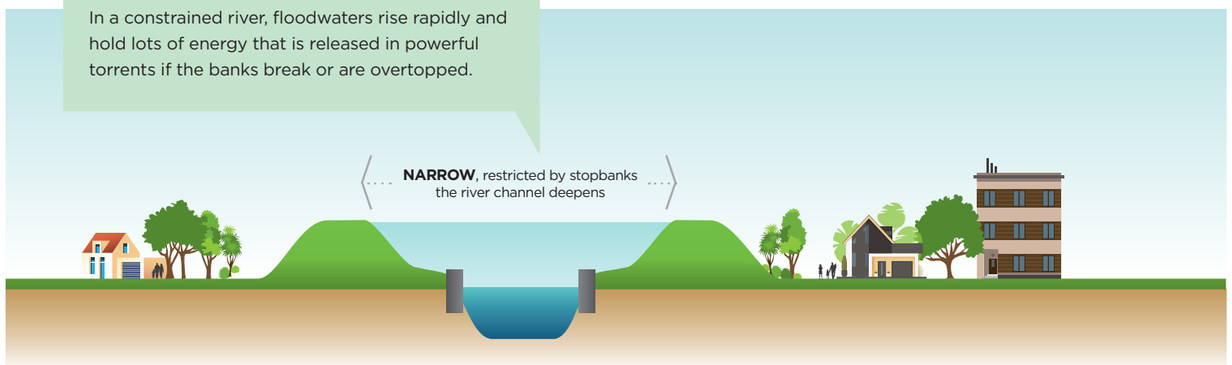
Artist's impression of a section of Te Awa Kairangi with widened river channel and berms and raised stopbanks, looking north. 📷 RiverLink

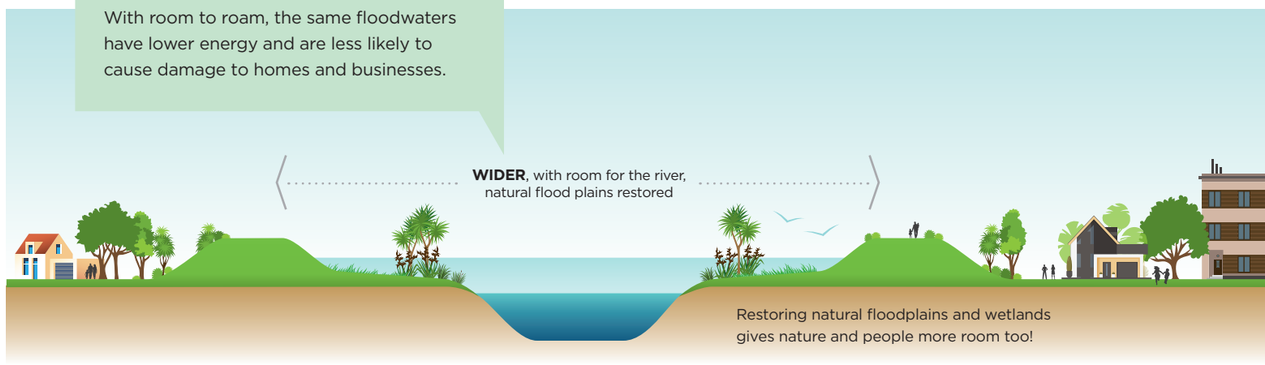
NEXT STEPS

Forest & Bird is calling on the government to work with local councils, iwi, and communities to:

1. **Develop a national Room for Rivers plan**, including strategic managed retreat from high-risk flood plains. **Embed this modern approach to flood management** in resource management and climate legislation.
2. **Appoint an advisory group of experts** to support the development of the Room for Rivers national plan and **create practical guidance for councils** on how to incorporate this and other nature-based solutions into district and regional flood management programmes.
3. **Establish a $500m contestable flood mitigation fund** to support councils to undertake Room for Rivers projects in their communities and **educate the public about the benefits of working with nature** to reduce flooding risks.

Making room for rivers is a nature-based strategy that will reduce flooding, help us adapt to climate change, restore native wildlife, and increase community wellbeing. For a full list of suggested actions to support a Room for Rivers approach, see **www.forestandbird.org.nz/roomforrivers**.





OUR BROKEN RIVERS

Many of our rivers no longer have the space they need to function naturally and flood safely. The result is an ongoing decline in their natural flood capacity, health, and habitat quality. Add in climate change and the picture is worrying, with more intense and record-breaking rain events already happening.

In June 2021, for example, 551mm of rain fell on the Canterbury foothills over three days – the greatest intensity ever recorded in the area. Waters in the Hakatere Ashburton River rapidly rose to a peak of 1794m^3/s – the highest flow the river had experienced since 1956.

The resulting floodwaters damaged houses and farms, cut off small towns, closed roads and the rail line, and took out fences, bridges, irrigation equipment, and stock feed. More than 200 households and 300 people were evacuated, and 32 houses were damaged. There were 3800 insurance claims totalling $46.4m, and $5m of damage was done to roads.

It was one of at least eight serious flooding events over the past five years that have caused huge damage and stress to communities in Tairāwhiti Gisborne, Central Hawke's Bay, Westport, Fox River, Franz Joseph, and Canterbury. In 2017, the entire town of Edgecumbe, in the Bay of Plenty, was forced to evacuate.

The Hakatere Ashburton, like New Zealand's other braided rivers, is an extremely high-energy system, carrying gravel and other sediment from the Southern Alps all the way to the coast. Historically, these rivers had room to move, creating wild landscapes and fertile plains.

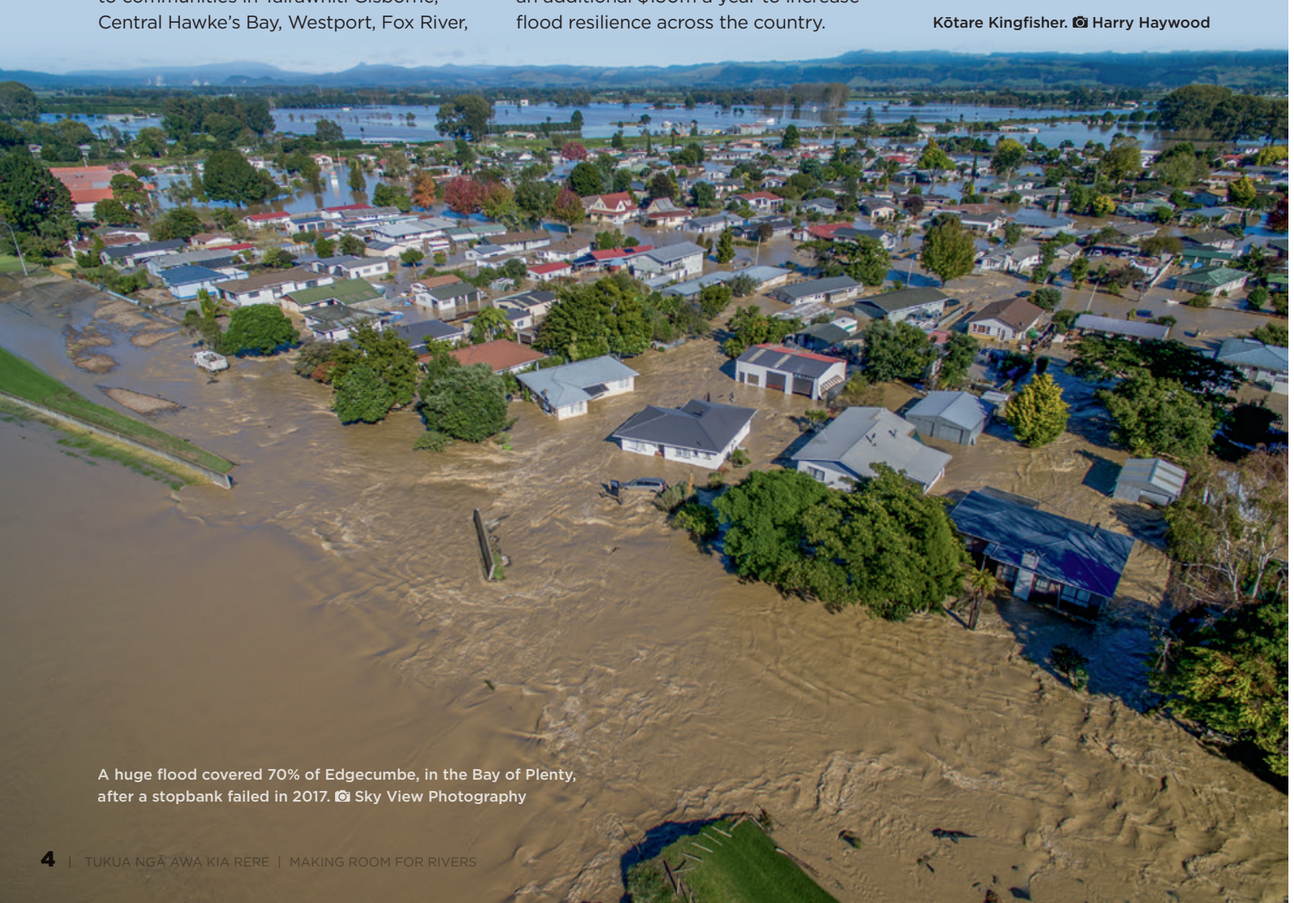
Over time, however, these rivers have been confined by stopbanks and encroached by farming, hydro, and irrigation schemes.

It's not just braided rivers that have been modified and restricted by hard-engineered structures, including flood mitigation. In fact, more than 100 towns and cities across New Zealand have families and communities living alongside rivers or on flood plains that are protected by flood protection schemes.

Many stopbanks need expensive upgrades to cope with change. Te Uru Kahika Regional and Unitary Councils Aotearoa has asked the government for an additional $150m a year to increase flood resilience across the country.

Tukua ngā awa kia rere
It's not too late for New Zealand's rivers. Letting them flow more freely will restore their mana and health. This nature-based solution can help communities and farmers adapt to climate change. Our special river birds and fish will also benefit and have more space to thrive.

Kōtare Kingfisher. Harry Haywood



A huge flood covered 70% of Edgecumbe, in the Bay of Plenty, after a stopbank failed in 2017. Sky View Photography

THE AWA USED TO SING

Arconnehi (Aki) Paipper was born and grew up in a home next to Kohupātiki Marae, on the northern bank of the Ngaruroro River near Clive, in Hawke's Bay.

Kohupātiki is named for the kohu mist that hangs over the river, and for the mud stirred up by pātiki black flounder that used to abound there.

The river was very different during her childhood, she remembers. It was full of kai that could feed the whole community. Her tīpuna and whānau were supported and nourished by the awa.

"If we had manuhiri visitors at Kohupātiki marae, it was no problem for our dads and uncles to go out and collect 300 flounders for breakfast, and every person had their own flounder," said Aki, who is Ngāti Hori, a hapū of Ngāti Kahungunu.

"When my dad and them put the hīnaki eel traps in to catch longfin tuna, it took six of his shearers to pull that hīnaki out. That's how important the river was back in my childhood. We never starved. We ate top shelf."

But, in the late 1960s, the Ngaruroro River was diverted away from Kohupātiki Marae into a straightened channel lined with stopbanks. What was left – the river's natural path – suffered a catastrophic decline in health.

The energy of the awa was taken away, and it could no longer cleanse itself. Silt covers what used to be clean gravels, water quality has declined, and the channel is infested with weeds. Migrating fish species, including longfin tuna and pātiki black flounder, have suffered.

"The river is silent. It doesn't sing like it used to," added Aki. "We don't take our children to swim and connect with the river in the same way. For me, it's a cultural disconnect."

Pātiki black flounder.
Illustration 1870 by Frank Edward Clark

Aki Paipper remembers how the Ngaruroro River was full of kai before it was modified and diverted away from her marae. Iain McGregor/Stuff

The natural connection between awa, their flood plains, groundwater, and springs was key to the creation and fertility of the Heretaunga Plains, says Ngaio Tiuka, director of the Environment and Natural Resources Unit at Ngāti Kahungunu.

"People of Kahungunu have lived alongside these rivers and formed connections with them over many generations," he said.

"When rivers are allowed to move more naturally, their waters replenish the land, the groundwater beneath, and in turn the people."

The cultural practices of Kahungunu were – and still are – connected to these waterways, many of which have vanished because of hard-engineered changes. These have disregarded the practices and connections of Māori with their waterways and, in many instances, eroded part of their identity.

"Rivers and streams have been shifted. Communities and marae have lost access to water. Mahinga kai is degraded, affecting the ability to manaaki manuhiri [welcome visitors]," added Ngaio.

"Marae and hapū identify waters of significance in their pepeha. When rivers are diverted or sucked dry, our pepeha becomes theory, practices are lost, captured only in a story, on a path to becoming a myth."

Ngaio says making room for rivers offers a chance to restore connections and te mana o te wai, a concept that refers to the vital importance of water by prioritising its mana, health, and wellbeing.

"Making room for rivers is an opportunity to restore those connections. If our awa have room to be themselves, their health will improve. We can help the awa support us again."

Ngaruroro River, Hawke's Bay.
David Wall

THE NETHERLANDS

ROOM FOR THE RIVER

In the 1990s, the Netherlands experienced unprecedented floods that overwhelmed stopbanks and other flood protections, triggering the evacuation of hundreds of thousands of people and a million livestock.

With the intensity and frequency of flooding increasing, government officials decided that building taller and taller stopbanks was no longer an option – they needed to do something different.

In 2007, they started the Room for the River programme to restore rivers' natural flood plains in strategic places, making room for rivers to flood safely. During the past 15 years, the €2.3 billion programme has proven this modern nature-based approach to flood management works.

Tailor-made solutions were proposed for each of the 34 Room for the River locations, the last of which was completed in 2022. Measures included lowering and widening flood plains, restricting development on flood plains, strengthening and relocating stopbanks, reducing groyne heights, and removing obstacles (such as bridge supports) from river channels.

A key part of the programme was improving riverbank habitats, which benefits nature and offers improved leisure opportunities for residents.

A study of two rivers in the programme, the Rhine and the Meuse, noted that widening the rivers enough to lower water levels by 30cm during floods could reduce the probability of stopbank failure by two to five times. Lowering levels by 50cm could reduce the probability of failure by more than 10 times.

It's a nature-based solution that has placed the Netherlands well ahead of other nations in adapting to the impacts of climate change.

It has also improved quality of life for residents, allowed more space for wildlife and recreation reserves, promoted housing developments in safer spaces, and protected heritage villages and beaches, boosting tourism.

The Dutch government says it has been more cost-effective than constantly repairing or rebuilding flood protection and other infrastructure such as roads, bridges, and towns after large floods.

International engineering consultancy firm Royal HaskoningDHV was involved in the most challenging Room for the River projects in the Netherlands.

George Peters, its global director of climate resilience, said the programme broke with the traditional Dutch reliance on dyke reinforcement as its primary flood risk management tool.

"Instead, we employed nature-based solutions that increased the rivers' water-carrying capacity by opening up more room for the water to naturally flow," he explained.

"As a result, residents are safer, communities are more resilient, and the whole area is more attractive for recreation and tourism opportunities."

> *Climate change will shift the area of geographical risk of floods and make new areas, not presently affected by such events, more susceptible to floods*
>
> **Te Uru Kahika Regional and Unitary Councils Aotearoa**

Deventer, The Netherlands: View across the new channel of the River IJssel, created for the Room for the River project, with the main river channel in the background. 📷 **Frans Blok**

BRINGING BACK NATURE
MUNICH, GERMANY

Germany's Isar River, which flows through the city of Munich, was engineered into a straight channel in the 1800s. By the 1980s and 1990s, the impact of that engineering was clear: the risk of flooding and damage to property had increased, water quality and the health of the river was poor, and there was limited access to the river for the community. In response, the Isar Plan was launched to make room for the river – and the community – through an 8km stretch within the city. From 2000 to 2011, the riverbed was widened, weirs were removed, gravel banks and islands were created, habitat for fish and birds was restored, and space was made for people to access the river and relax on its banks. The river now flows more naturally, native species have better habitat, the community is more resilient, and Munich has a popular new swimming spot that large numbers of people visit throughout the summer.

Room for the River Isar. 📷 iStock

Grantham flood aftermath. 📷 Dean Saffron

MOVING A TOWN
GRANTHAM, AUSTRALIA

In 2011, the area around Grantham, a small town on a flood plain in Queensland, Australia, was hit by one of the strongest rainstorms since records began. Rain fell so heavily and fast that a flash flood – an inland tsunami – hit the town, killing 12 people and destroying most of the town centre. Rather than rebuild in the same dangerous location, a plan called Strengthening Grantham was developed to move the town uphill. Land on a nearby farm was purchased for the new development. With leadership from a small project team, including the mayor and residents, it took just 11 months to move the first families off the flood plain and into their new homes. Since then, around 120 families have moved uphill. Today, the council continues to help people move off the flood plain, taking them away from potential harm and making room for the river to flood safely.

SOMETHING HAD TO CHANGE
JEFFERSONVILLE, USA

Flooding was a regular occurrence in the small village of Jeffersonville, Vermont, which sits on a flood plain at the confluence of the Brewster and Lamoille Rivers. During heavy rain, the Lamoille filled up, causing the Brewster to flood the village. In 2011, Jeffersonville experienced four floods in less than 11 months, and the community decided something had to change. Residents worked with council planners and engineers to develop a master plan to reduce flooding risks. An old rail bridge over the Brewster River was raised and widened, making room for the river to move and preventing floodwaters backing up under the bridge. Plans to develop low-lying land in the path of floodwaters were shelved, and the development moved to a higher location, with the flood-prone area turned into a park. Jeffersonville is now a more resilient community, able to withstand future floods as the climate changes.

Jeffersonville today. 📷 Frank Grenon

Climate change will substantially increase the severity and frequency of the risk of flooding.

Te Uru Kahika Regional and Unitary Councils Aotearoa

The Grey River at Greymouth, West Coast. Ⓒ David Wall | **COVER:** Ngaruroro, Clive and Tutaekuri rivers flowing into Hawke's Bay. Ⓒ Rob Suisted

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Forest & Bird YOUTH
NGĀ MĀHURI TIAKI

CELEBRATING 100 YEARS 1923–2023

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