Forest Fragment Management Series

FACTSHEET 5

FOREST FRAGMENTS CASE STUDIES

TURNEY BUSH – A TINY PEST-FREE TREASURE

Seven years of restoration works by the National Wetland Trust, Waipa District Council and many volunteers at Turney Bush in Rotopiko Reserve has resulted in a vigorous and diverse native understorey and a succession zone to link the kahikatea fragment to a 30 year old planted podocarp stand. Education activities have been installed to teach future generations about forest ecosystems.

The small stands of kahikatea trees that dot the Waikato lowlands are an iconic feature of today's landscape. Most of them are regrowth, dating back to the time of early European land clearance, but even 120 year old trees are tall.

The kahikatea trees in Turney Bush at the Rotopiko peat lake reserve near Ōhaupo are so tall they sway and creak with the gentlest breeze. The amazing root systems at their base are exposed, all buttressed, gnarly and twisted – a sign that this was once a swamp forest on the edge of a peat lake.

Some of the trees here are big enough to be over 300 years old. They must have experienced many changes in their lifetime. The biggest change, no doubt, was the land drainage in the 1900s that sucked away the mud and water that once covered their roots, leaving them high and dry.

Kahikatea could survive the drainage, but many of the species that would have nestled in the slushy soil under their canopy could not. Black mudfish have retreated to the drain. Sedges and herbs shrivelled up and vanished. Once dry the site became an ideal place for cattle to shelter in. Their grazing and trampling took care of the remaining undergrowth, leaving a stand of trees over a dry empty forest floor. An old circular saw, now rusting and falling off its spindle, explains several large canopy gaps where the sun streams in and rank pasture grows tall and thick. As part of the Turney farm, this stand was treasured for its beauty, and also for the valuable resources it provided – shelter for stock, the odd timber tree and sunny gaps to grow potatoes!

The drains that robbed this swamp forest of its water and fragmented Rotopiko into three lakes were put in long ago and are so extensive across the catchment that it's unlikely this forest will ever become a swamp again. All is not lost, however. The kahikatea trees here have many more centuries of life left in them and the understorey is starting to thrive again.

The National Wetland Trust is keen to invite visitors to see the amazing kahikatea stand and its restoration progress.

A HELPING HAND

The National Wetland Trust has been restoring the tiny forest fragment and the associated peat lake wetland margins as part of its plans to build a National Wetland Centre. The 1 hectare stand was acquired by the Waipa District Council in 2011 as part of Pat Turney's reserve contribution when he subdivided along Jary Road. Cattle were fenced out and it didn't take long for māpou, tītoki and pukatea seedlings to appear. Other species were slow to arrive, so the council and later the Trust and many volunteers followed up with enrichment planting – swamp astelia and swamp cutty grass in the damper areas, and future canopy trees in the big sunny gaps.

The Trust's volunteers have also been controlling the weeds – arum lily, stinking iris, barberry and Jerusalem cherry, all those spiky or poisonous plants that often thrive in grazed stands because the cattle won't touch them. The Trust also set up monitoring to document the changes.

In 2012, the Trust installed a 2-metre-tall pest fence around the entire stand and neighbouring East Lake. All introduced mammals were eradicated, leaving the trees to flower and fruit freely, the seedlings to survive and the birds to roost and nest in peace.

BUILDING A BUFFER

The pest fence helps to block wind and provide shade, acting like a buffer for the small isolated stand. The forest margins were planted up with hardy natives like māpou, round-leaf coprosma and māhoe to quickly seal the edge and create a more natural humid and shady forest interior.

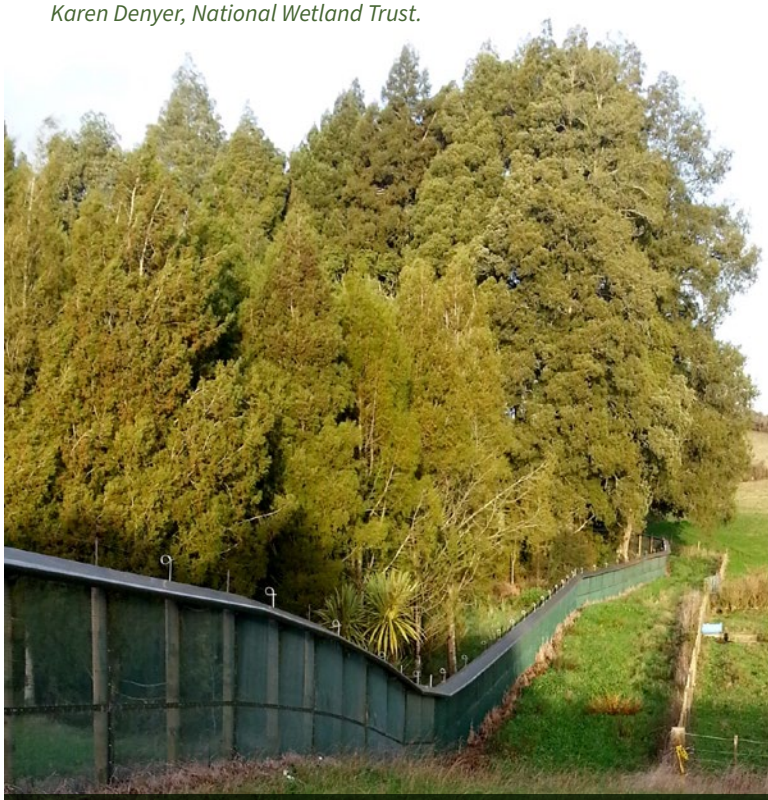
Back in the 1980s, the council planted a stand of dense tōtara and kahikatea off the ridge to the north of the big stand, and later planted a nurse crop linking the two to allow the kahikatea forest to double in size. The removal of rabbits and hares from inside the pest fence means seedlings can self-establish.

The Trust is keen to get people to visit the site and learn about the restoration, so they built tracks and installed a discovery trail with hands-on activities for families. Children can measure the kahikatea tree girths to guess how old they are, take a woody wetlands quiz and learn that tall kahikatea trees may have once been roosting sites for pterosaurs!

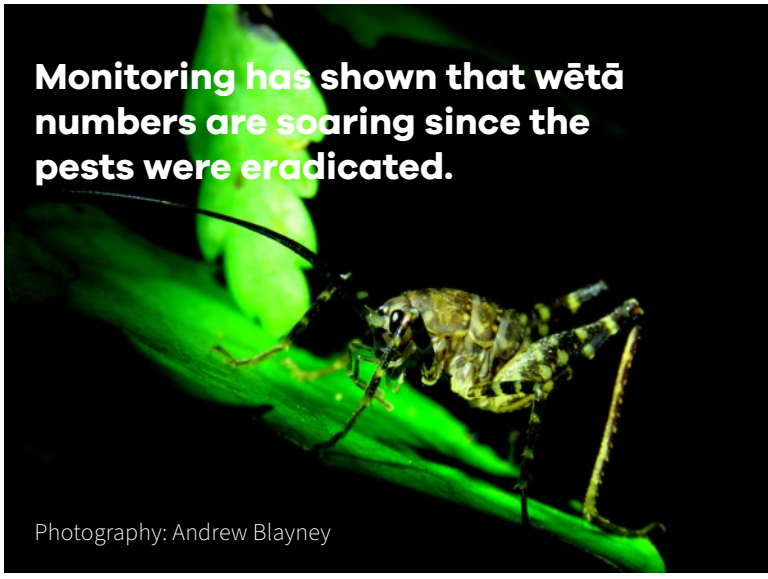
The restoration of Turney Bush demonstrates how quickly a small forest fragment can recover with a little help, and the Trust says everyone is welcome to visit and see for themselves.

"We want people to see that these tiny, old kahikatea stands still have plenty of life left in them."

Karen Denyer, National Wetland Trust.



The whole forest fragment is enclosed in a pest fence, which also helps reduce light and wind at the forest edge.



Monitoring has shown that wētā numbers are soaring since the pests were eradicated.

Photography: Andrew Blayney

It didn't take long for the small forest fragment to recover with a little help.

NURTURING THE NGAHERE – A HAPU APPROACH

Ten small forest fragments on multiple-owned Māori land in the Kaimai foothills are set to be restored and protected under a Ngā Whenua Rāhui kawenata (covenant). The hapū are working with Waikato Regional Council to fence and plant protective buffers around the bush patches, which will allow a healthy native understorey to develop and encourage the return of native birdlife.

A dark korowai of tawa forest drapes over the shoulders of the Kaimai Range, sinking into the gullies before fragmenting into bushy threads surrounded by pasture so green it almost hurts your eyes.

While the bulk of the Kaimai ngahere (forest) is Department of Conservation reserve, most of the broken remnants on the lower slopes are on farmland, where landowners are increasingly taking an interest in the welfare of the bush patches.

One such cluster of forest fragments is on Māori freehold land held by the Te Hanga North Land Trust, a hapū within Raukawa.

Anyone heading over the Kaimai hills from the Waikato to Tauranga will drive past the trust's land as they gear down for the long ascent up to the ridge. The verdant farmland is leased out to neighbours Peter and Christine, who use the lush paddocks as a runoff for their main farm.

FORGOTTEN FORESTS

For many years the forest was left in the gullies, too steep to clear for pasture but unfenced and grazed bare by cattle. The remnant trees pumped out seedlings, only to be trampled or eaten the minute they popped out of the ground. Without a dense understorey, the wind and light reached far under the canopy, drying out the soil and foliage and shortening the lifespan of the grand old trees. Grazed forests are on a slow path to oblivion, with no saplings ready to replace the generation of older trees as they age and topple over.

The fate of the forest patches on Te Hanga North's block changed when Waikato Regional Council Catchment Management Officer Rien van de Weteringh paid a visit. Rien had been working with their neighbours, Peter and Christine, to protect land and waterways on their farm. Through this connection he met the Te Hanga North trustees who expressed their interest in protecting the bush and streams on their own land.

The Te Hanga bush gullies feed into the Rapurapu stream headwaters of the Waihou River.

Many years earlier, the hapū agreed to allow the regional council to run a bushline fence along the edge of the main forest which extended onto their land. As part of the Waihou catchment scheme, the council wanted to protect the entire forested ranges because they recognised that healthy bush was going to absorb more rainwater to help reduce soil erosion and flooding downstream.

However, the half dozen smaller gully fragments continued to be eaten out by farm stock. The hapū wanted to protect them and Rien was able to help. Trustee Les Kinred said building a trusting relationship with Rien was crucial as a recent experience with another landowner had left him cautious about dealing with the council. Fellow trustee Moana Walters says Rien is straight up – "what you see is what you get" – and that gave them the confidence to move ahead in partnership with the council to restore the bush. Les says positive outcomes can be achieved when the right people are involved and work towards a common goal. "A win-win for all and it clearly indicates the value of co-operation, consultation, good field work and local knowledge, rather than being driven by people stuck behind desks!"

Forest fragments that extend off the Kaimai Range into gullies are being fenced and planted with generous buffers.

HOLISTIC PLANNING

Rien worked alongside Te Hanga North's farm advisor, Russell Whyte, to draw up a whole farm plan, including not only the ngahere but also the wetlands, stream sides and eroding land, along with suitable places for native timber plantations. The hapū is looking to plant a woodlot of tōtara, with a long term view of harvest in 50 or more years. It might take longer to grow than exotic pines but the lumber value is likely to be much greater, plus it's better bird habitat in the meantime.

The plan recommended putting in 3.5 kilometres of nine-wire fences to keep stock out of the bush and planting a wide area on the forest edge to shield it from wind and light. It also suggested planting a narrow gap between two fragments to create one larger patch with a smaller amount of 'edge'.

Fencing and planting up the eroded steep slopes next to the forest solves a whole host of problems by:

1. protecting the soil
2. keeping sediment out of the streams
3. creating a protective bushy buffer for the forest remnant
4. increasing the size of native forest habitat for wildlife
5. keeping stock safe from injury.

To get the work underway, Rien contacted the Matamata-Piako District Council and Ngā Whenua Rāhui and they put together a three year funding package. In just under two years, nearly 10,000 plants have gone in the ground. Most of the work has been done by local contractors, while hapū member Ian Walters sprayed the land for planting and planted some 1000 seedlings himself. To ensure the long-term protection of their hard work and of the bush, the hapū have put 10 bush patches, totalling 19 hectares, into a 25 year Ngā Whenua Rāhui kawenata.

The leasee supports the hapū's decision to fence off the forest patches and plant the eroding slopes. He helps cart the plants and fencing gear, and has done a fair bit of planting on his own land.

HEALTHY FOREST, HEALTHY PEOPLE

Healing a forest can also help heal people. A newly regenerated understorey will provide a natural storehouse of traditional medicine (rongoā) for the hapū to harvest, which along with cleaner water is a great return on the environmental investment made to the land.

Appropriately, Ngāti Raukawa is named after one of the trees their restoration work may help to protect. Māhinaarangi used the aromatic leaves of the raukawa as perfume for her Tainui lover, Tūrongo. They named their son, the ancestor of Ngāti Raukawa, after the plant, a glossy-leafed tree related to five finger. Restoring the forest may enable the hapū to return this special plant to their land.

WHĀNAU SUPPORT

"The whānau are right behind us," says Moana. "All the bush, we want to preserve it, we want more birdlife."

Kaumātua Lance Waaka grew up pig-hunting in the Kaimai Range and remembers hearing plenty of birds, even kiwi, at night. There's not so much birdlife there now, just the odd tūī and fantail, as well as magpies and other non-native species.

Moana says she has never even seen a kererū but her husband, Ian, has spotted them in the bush. Rats and stoats likely take their toll. Possums, too, though the flush of young tawa leaves and kāpuka dripping with flowers seem to indicate low possum numbers, at least for now.

The hapū don't have any immediate plans for pest control, but with the right advice and financial support it's something they would like to explore. They don't need to worry about weeds for now because the bush had been so eaten out by cattle there's not much there – just a bit of privet and hawthorn. While the vegetation becomes established, though, they will have to keep an eye out for unwanted plants like blackberry, Japanese honeysuckle and woolly nightshade.

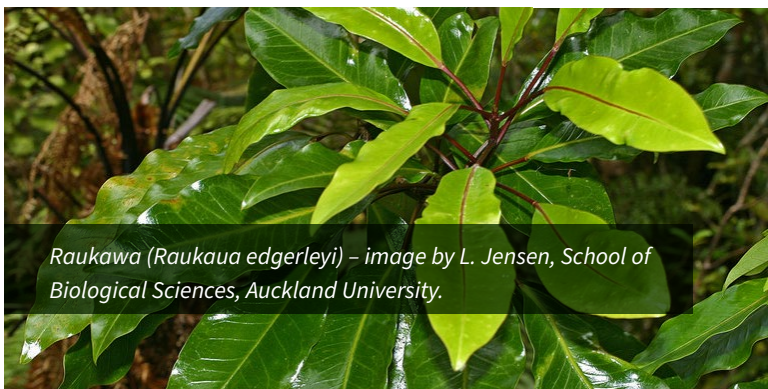
The trust members would like to see more of the whānau visit the bush, but it's hard to get the young ones away from their devices, says Moana. Ian says the grandchildren love to come up here to swim in the clear stream flowing from the bush, and he hopes they will keep coming back to see the shrubs he planted grow into a dense protective buffer. It's not really suitable for school or other community visits – being a working farm there's the leasee's needs to consider and too many health and safety forms to fill out!

NGĀ WHENUA RĀHUI FUND

The Ngā Whenua Rāhui Fund administered by the Department of Conservation helps Māori landowners to voluntarily protect natural ecosystems on their land, while retaining tino rangatiratanga (ownership and control). The fund helps with site management costs (like fencing and pest control), and legal costs to set up kawenata (covenants) that are set in place with 25 yearly reviews. Māori land authorities such as trusts and incorporations, organisations representative of whānau, hapū or iwi, and Māori owners of general land can apply.

Ngā Whenua Rāhui staff work with landowners to clarify what the mauri of the land means to them, so they can tell their own stories relating to their cultural histories while still protecting the land with pest and weed control operations.

doc.govt.nz/ngawhenuarahui



Raukawa (Raukaua edgerleyi) – image by L. Jensen, School of Biological Sciences, Auckland University.

FORESTS FOR THE FUTURE

Restoring the forest fragments on their land is all part of the farm environment plan for the Lea family of Cambridge. Their half dozen bush patches are being fenced off and allowed to regenerate. In the near future, the rejuvenated bush may be able to repay them by contributing abundant seeds to support the family's native plant nursery business.

What Charlie and Helen Lea do on their Cambridge farm could benefit hundreds of landowners in two major catchments.

The Buckland Road property straddles a ridge, with headwater streams flowing east towards the Hauraki Plains and west to Karapiro and the Waikato River.

Thankfully, this forward-thinking family farms with their downstream neighbours and future generations in mind.

Sustainability plays a key role on Ratanui, the 225 hectare sheep and beef farm where Charlie and Helen live with daughters Chelsea, Sophie and Georgia. Fencing and planting the stream sides and wetlands have been a priority to ensure water leaving the property is flowing clear. Another part of the family's Farm Environmental Plan is protecting and enhancing their native bush blocks.

FRAGMENTS OF HISTORY

There are half a dozen mature bush patches on the property, scattered remnants of the ancient podocarp-broadleaf forest that covers the nearby twin peaks of Te Tāpui and Maungakawa. Ranging from around 1-8 hectares, the fragments are mostly in tawa, along with pukatea, mangeao and rewarewa. A few podocarp trees like miro and rimu are also present, and would likely have been abundant prior to selective logging earlier last century.

When the Lea family purchased the farm in 2004, the fragments were quite bare underneath. The native seeds that germinated were mostly eaten or trampled by stock and feral fallow deer, and with no seedlings the long term future of the forest was at risk.

"Native forest is part of New Zealand, part of our heritage – ancient and unique."

– Helen Lea

STEPS TO RECOVER

Fencing stock out of the bigger patches was the first step to recovery. Fences were generally set well back along ridges – for practical reasons but also to allow for a planted buffer to protect the forest from edge effects (elevated wind and light that dry out seedlings).

After fencing a bush fragment, the Leas spot-spray to clear planting sites. This uses a fraction of the amount of chemicals compared to blanket spraying. Rank pasture between plantings helps prevent erosion, takes up excess nitrogen and keeps the soil cool and moist in summer. Hand releasing has been sufficient to allow the native saplings to survive, and eventually they will close up and shade out the grass. Thankfully, there are few invasive weeds. "Climbing weeds are the worst," says Helen, "You need to keep on top of them."

Feral deer encroaching on the property are still a problem – browsing some of the new plantings – but possums are kept in check by regular trapping organised by Waikato Regional Council. Helen hasn't seen many stoats, "but then you don't do you, they are quite wily". Stoat traps are a consideration for the future, and maybe rat control, as it's a treat to see and hear the native birds.

Underplanting the forest has not been a priority. For this busy family the focus has been to fence, plant and forget – letting the forest regenerate itself. Finding seedlings coming up is a real buzz, and tawa, pukatea, nīkau and other natives are popping up all over the forest floor after just a couple of years.

Even so, to help nature along, Helen and the girls collect seeds and prick out seedlings from dense clusters where they won't all survive, potting them up for later planting into the big canopy gaps and buffers. "The kids are great at spotting spindly seedlings like rimu in the dark forest litter," says Helen.

A waist-high seedling house purchased from Trees for Survival, with an overhead watering system and curtains of shade cloth for frost and sun protection, offers easy access for maintenance.

FOREST GIVES BACK

Money for the work has come from several sources – the Waikato Regional Council, Waikato River Authority and Ratanui farm itself – but the forest patches may someday help fund their own restoration.

The family raises locally sourced native plants as part of their on-farm restoration service, Cambrilea. Charlie set up Cambrilea as a weed-spraying business around 20 years ago, but that's summer work and they wanted to offer their staff year round employment. The wetter months are perfect for planting so they diversified the business, adding a nursery and contract planting service. It's the whole package as far as their council and farmer clients are concerned – Cambrilea provides plants, planters and weed maintenance. The business propagates a proven success suite of 16 native species, including 'Trees for Bees', and as the Ratanui forest fragments recover and regenerate their native seeds could contribute to the nursery stock in future.

SUSTAINABLE FARMING

Helen has a landscape architect background, which helped hone her knowledge and passion for native plants. She takes her expertise to the community, running the 'Trees for Survival' programme at Karapiro School and teaching sustainability to the next generation.

Helen reckons farmers are much more engaged in environmental works than people realise. "All industries should be solving their pollution issues, and I do think farmers are or need to become more sustainable for our environment," she says, adding that the spinoff is a value-added product that is "ahead of the game" and "proactive not reactive".

The family's philosophy and hard work has not gone unnoticed. In 2017, they were announced supreme winners of the Waikato Ballance Farm Environment Awards, taking six of the 10 category awards. No doubt their healthy bush patches helped the judges describe this as a "stunning farm".

"Forest and wetlands used to be considered wasteland on the farm, now they are valued." *– Helen Lea*

For more information call 0800 800 401 or visit waikatoregion.govt.nz.

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Waikato REGIONAL COUNCIL
Te Kaunihera ā Rohe o Waikato