

# OUR REMARKABLE SOUTHERN KAURI-LANDS

The magnificent kauri of the Waikato may not be as famous as some of their northern cousins, but they are vital to the future of the species, being almost free from kauri dieback disease. In the first of a two-part series, **Dr Bruce Burns**, one of New Zealand's leading kauri academics, looks at the importance of our southern kauri forests and what makes them unique. Despite the threats they face, he is hopeful that, with a little human help, they can and will thrive into the future.

Giant kauri at Waiomu, Coromandel. © Ian Preece

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Kauri have charisma. Their imposing columnar trunks rule over the forest, and their spreading grey-green canopies are open enough to provide a light and uplifting ambience to the forest understorey. Kauri are extreme trees in many ways – extreme in potential size, life expectancy, effects on the forests they inhabit, values they provide, and cultural importance.

As a botanist, I am always excited when I venture into a kauri forest, as it creates an unusual environment providing habitat for rarely seen plants. For example, the fan fern and the kauri greenhood orchids are almost solely restricted to kauri forests, with many other species having similar strong associations with kauri, including Archey's frog. But it's not only about individual species, being in a kauri forest stimulates all the senses at a more fundamental level – one can feel the presence of these giant trees around, reigning over the forest and its denizens.

Although kauri encompass the northern third of the North Island, narratives of kauri forest often focus on Northland and Auckland, where their abundance and influence on landscapes are undoubted. The influence of kauri in the southern third of its range, however, has been somewhat neglected. Here, I want to delve into the story of kauri at its southern reaches – the kauri of the Waikato, Coromandel and Kaimai Ranges. In these areas, kauri is equally special, has its own ecological signature, and provides historically and biologically fascinating stories with similarities and differences to the north.

Kauri extend from North Cape to its southernmost natural stands on or close to 38°S latitude just south of Kāwhia. That puts about one-third of its distribution south of the Bombay Hills in the Waikato region (including the Coromandel), with a few stands still occurring in the far northwestern corner of the Bay of Plenty region around Katikati. In the Waikato, kaurilands now cover about 94,000ha in a range of ecological scenarios, but, similar to other parts of their distribution, this represents a shadow of its former territory.



Kauri greenhood orchid. © Biosense



Fan fern *Schizaea dichotoma*. © Jacqui Geux



Archey's frog. © Mahikarau Forest Estate





→ After the extensive exploitation for kauri timber that occurred from the mid-19th to the early 20th centuries, the area in mature kauri forest nationwide is now estimated at only a few percent of its original extent, with a greater but still relatively small area in younger regenerating kauri stands that were mostly initiated after the logging. Interestingly, much territory that originally supported kauri has not regenerated with kauri after its removal. It is not clear why this is so, but it is probably because logging was so effective that it removed any potential kauri seed sources and that logged sites were usurped by other tree species at the key time when kauri regeneration could have occurred, making them unavailable for kauri regeneration even if seed did eventually arrive.

In its southern range, notable stands of old-growth kauri still exist and include the high-altitude kauri on Te Moehau, giants in the Manaia Forest Sanctuary saved from logging in 1972, stands of mature kauri in the headwater valleys of the Third Branch of the Tairua River (which were inaccessible to exploitation), Whenuakite, Waiau Kauri Grove, Waiomu, Mt William, Tuahu, Pukemokemoke, Miranda Scientific Reserve, and Te Kauri Park near Kāwhia.

Many of these surviving mature stands still include some amazingly big and very old trees. The Manaia Forest Sanctuary on the Coromandel Peninsula was established to protect its superb old-growth kauri and holds many trees greater than 2m in diameter, including the sixth largest known kauri, Tānenui. This tree was measured with a diameter of 3.5m and standing at 49.7m tall in 1976; it will be larger now. In 1987, Moinuddin Ahmed and John Ogden measured 25 old-growth kauri stands across Aotearoa, and the stand at Manaia had the largest basal area (a measure combining density and tree size) recorded anywhere. It also had the oldest trees, with one reliably estimated at 1527 years old.

Large kauri also occur in other parts of this southern domain. In 2002, former New Zealand Forest Service ranger Max Johnston provided details of 31 massive kauri that he and his colleagues had discovered and measured in the last few decades of the 20th century. These include the well-known Hamon Kauri, Square Kauri, Cookson Kauri, Tairua no 1, Waiomu no 1, and Tuahu trees. The amazing exploits of Johnston and his friends in searching out these large kauri in the Coromandel are not unique, and others continue to go into the hills in search of trees and other artifacts of the kauri logging era. Other kauri of interest are those that have paired up to form two large trunks side by side. These include the Siamese Kauri of the Waiau Grove and the Twin Kauri just north of Tairua.



Siamese Kauri, Waiau Forest, 309 Road, Coromandel.  
© Ian Preece

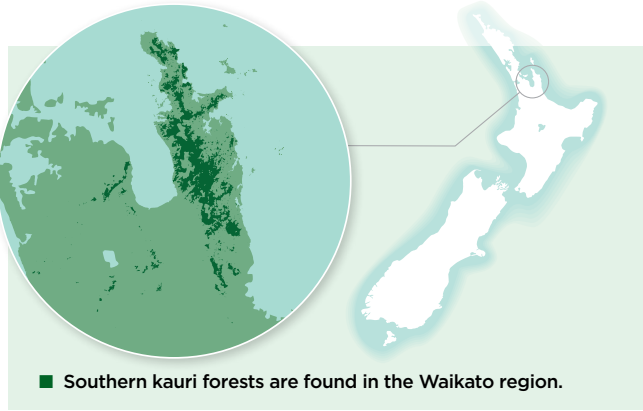
Although large trees still exist in our kauri forests' southern range, even larger giants that now no longer exist were recorded in the past. The 19th century botanist Thomas Kirk measured a kauri at Mill Creek, Mercury Bay, near Whitianga, at 7.3m in diameter. This giant tree was known as "Father of the kauri", "Father of the forests", and "King of the kauris" by local iwi in the area. An enormous tree was also reported in the upper reaches of the Tararu Stream, near Thames, in the late 1800s, with a diameter of approximately 4.5m, while local lore reports that kauri loggers and gum diggers used to have dances on a kauri stump 4.2m in diameter near Dancing Creek in the Kauaeranga Valley. By comparison, the largest surviving kauri tree in Aotearoa, Tāne Mahuta, is approximately 4.9m in diameter, according to a 2009 measurement in the New Zealand Tree Register.

As a species, kauri (*Agathis australis*) is ancient. It has been in New Zealand for most, if not all, of the time Aotearoa has been a separate fragment of the former Gondwana supercontinent. Kauri were once distributed more widely in New Zealand than now, with kauri fossils found throughout New Zealand, including in Southland. More recently (geologically speaking) during the last ice age, kauri were probably limited to small refuge areas in the Far North before spreading south to their current distribution, starting around 7000 years ago.

About 3000 years ago, Kauri reached their current boundary, a line around 38°S latitude joining Kāwhia Harbour on the west coast with Tauranga on the east coast, with no evidence of further southward movement since then. This line is referred to as the Kauri Line and has been identified as a major zone of discontinuity in the distributions of many other native plant and animal species.

The question of why kauri only grow naturally north of this line in modern times has been the subject of conjecture among scientists for many years. A key early hypothesis was that seedling kauri are killed by frosts and this line marks the point moving southwards where frosts are too common for kauri seedlings to survive. Nevertheless, kauri planted in more southern areas seem to survive and grow well, albeit in sheltered sites, with individual kauri planted as far south as Rakiura Stewart Island. As well, stands planted around Wellington and New Plymouth are known to produce persistent seedlings, bringing the frost hypothesis into question.

Alternative hypotheses for the location of the Kauri Line focus on historical or environmental explanations. One historical rationale is that the Kauri Line coincides with the furthest probable extent of continuous forest during the height of the last glaciation. A hypothesis based on this coincidence suggests this landscape pattern has persisted into modern times, with kauri present in this continuous forest zone during glacials but outcompeted when the opportunity arose to colonise more southern sites that became available to



■ Southern kauri forests are found in the Waikato region.

forest species when the current interglacial began. In terms of an environmental explanation, a 2020 analysis by PhD student Toby Elliott pointed out the height of the land above sea level generally increases abruptly as one moves north to south across the Kauri Line, and this sudden elevation increase may make kauri colonisation to the south difficult.

Kauri have always been important to the human inhabitants of its southern range. To iwi, kauri was and is a taonga species and the king of the forest. Many large war canoes were made from specially selected kauri logs, and kāpia (kauri resin) was used to provide a tattoo pigment, used as a fire-starter, and chewed as a treatment for stomach upsets. The earliest encounter by Europeans of kauri was undoubtedly when Captain Cook and his crew

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Kauri boom, Whenuakite Creek, Coromandel, circa 1859-1900. © Alexander Turnbull Library

landed at Mercury Bay, in the north-eastern Coromandel, in November 1769. These and other early European explorers were impressed with the kauri as potential ship masts and spars, and kauri were first cut and exported in numbers for this purpose, many from the harbour at Whitianga.

By the middle of the 19th century, the high quality and quantity of timber that could be gained from logging kauri led to the establishment of a substantial industry, a key factor in kickstarting the New Zealand economy. Bushmen were employed to extract the often giant logs from forests wherever kauri occurred, and their efforts live on as part of the pioneering lore of New Zealand.

Nowhere were the ingenuity and engineering skills of the kauri bushmen used with more ruthless efficiency than in the steep terrain of the Coromandel Range, including the Kauaeranga Valley. The valley was logged for kauri from the 1870s to the 1930s, and during this time approximately 450,000m<sup>3</sup> of kauri timber were removed, enough to construct 20,000 three-bedroom houses. The result of this extreme activity has left scars on the landscape that are still observable, and the forest is still recovering.

The last areas in Aotearoa to be logged extensively for kauri were generally in the south. The last kauri “dams” built to move logs downriver were those in the Kaimai Range near Katikati in the early days of World War II.

As well as timber, kauri also produces kāpia or kauri gum. In some ways, “gum” is a misnomer, as the exudate produced from kauri is not actually a gum in a strict sense but a plant resin, and fossilised kauri resin can be considered amber. Kauri resin accumulates in soil currently or formerly occupied by kauri forests, and the mining of such deposits fuelled an extractive industry almost as important as the kauri timber industry in 19th century New Zealand.



Kauri produces kāpia or kauri gum. © Bruce Burns

Although most kauri resin was extracted in Northland, gum digging also occurred on the Coromandel and a few other sites in kauri's southern range.

Once it became difficult to find gum in soil, it was discovered that it could be obtained by “bleeding” trees, by purposefully cutting notches in trunks. The practice of bleeding kauri was employed on the Coromandel Peninsula, and many of today's large trees exhibit scars resulting from such actions.

This may make them more susceptible to disease in the future, although the gum sought by the bleeders but still on the trees could now be protecting these giants from further decline by acting as a natural Band-aid.

This article was commissioned by Waikato Regional Council with the support of Tiakina Kauri, the Kauri Protection Agency. In the next issue: Bruce Burns looks at the unique ecology of Waikato's kauri forests and the threats they face from kauri dieback disease and climate change.



### Celebrating southern kauri

Many agencies and locals are involved in helping look after New Zealand's southern kauri forests. Pictured (from left) Toni Twyford, of Tiakina Kauri the Kauri Protection Agency, Maree Limpus, DOC Community Ranger Hauraki, and Hirini Rolleston, Biosecurity Officer Kauri Protection for Waikato Regional Council. “Protecting our kauri from the pathogen associated with kauri dieback disease is critical if future generations are going to be able to see and appreciate them,” says Kim Parker, who heads up Waikato Regional Council's kauri protection team. “That's why we are committed to working with the local community, mana whenua, and other agencies to protect these kauri forests and celebrate their unique features.”

For more information see  
[www.waikatoregion.govt.nz](http://www.waikatoregion.govt.nz) or  
[www.kauriprotection.co.nz](http://www.kauriprotection.co.nz).



ANOTHER  
Forest & Bird  
WIN  
FOR  
NATURE

The lower reaches of the Ngaruroro River are home to many bird species, including kōtuku white heron. © Tom Kay

Following a seven-year campaign, the whole of the Ngaruroro River is set to be protected by a Water Conservation Order following a successful legal appeal by Forest & Bird. **Caroline Wood**

In a big win for nature in the Hawke's Bay, the Environment Court has recommended a Water Conservation Order (WCO) for the entire Ngaruroro River. This will ensure it is recognised and protected for future generations.

Forest & Bird, Fish & Game, Operation Pātiki Ngāti Hori ki Kohupatiki, Whitewater New Zealand, and Jet Boating New Zealand lodged the original application for a WCO on the Ngaruroro River in 2015.

In 2019, a Special Tribunal recommended only the upper naturally confined section of the braided river – one of only a few of its kind in the North Island – be covered by a WCO.

Forest & Bird appealed this decision, seeking the lower river's braided reaches also be recognised as outstanding native bird habitat. The case was supported by the Department of Conservation.

In its report, released last December, the Environment Court agreed, saying both the upper and lower river were worthy of protection.

Forest & Bird's freshwater advocate, Tom Kay, welcomed the decision, saying it was a win for the health of the river.

“Braided rivers like the Ngaruroro are rare in the world. While we have several in the South Island, the Ngaruroro is the most intact one in the North Island, which makes it extremely special,” he said.

“The upper reaches of the Ngaruroro are about as close as you can get to ‘pristine’. The landscape is incredible, the water is crystal clear, the habitat is outstanding for whio blue duck, and there are excellent opportunities for whitewater kayaking and rafting.

“The braided reaches of the lower river, and the estuary it flows into, are home to many threatened bird species, including kōtuku white heron, matuku

hūrepo Australasian bittern, pohowera banded dotterel, and the tarāpuka black-billed gull – the world's most endangered gull.”

Once the WCO is gazetted – hopefully, later this year pending appeals – the Ngaruroro River will benefit from prohibitions on damming, limits on alteration to its flow and form, and measures to protect water quality.

“It's been a challenge facing vocal opposition from some groups, as well as the regional council, which spent more than \$1m fighting the proposal,” Tom added.

“The braided reaches provide a refuge for wildlife and also space for the river to flood. In the wake of Cyclone Gabrielle, we hope the WCO will spark a wider conversation about how we live with these rivers and their floodplains, in the future.”



Kōtuku. © Craig McKenzie

HISTORY  
HIGHLIGHT

In 2007, Forest & Bird helped stop an inappropriate hydroelectric power project on the Gowan, a tributary of the Buller River. The project proposal was the first time anyone had sought to vary a Water Conservation Order, and the Environment Court's decision was an important win for the river.