

# Fencing kahikatea remnants is worthwhile

*The simple act of fencing enables even small and long-grazed kahikatea remnants to restore themselves and compete with most weeds, according to a Waikato Landcare Research study.*



Photo: John Greenwood

*Kahikatea remnants are an iconic feature of the lowland Waikato landscape.*

The study focused on the kahikatea stands of the Hamilton and Matamata plains, which are an iconic feature of the Waikato landscape, despite occupying less than 1% of their original extent. Most of the kahikatea in these stands are comparatively young and even-aged, around 100 years old, having largely developed in clusters around 300–400 year-old 'seed trees' that escaped forest clearance. The remnant stands are often the only places left for native plants and animals in the intensively farmed landscape but continued grazing reduces the chance of their long-term survival.

Some farmers are reluctant to fence natural areas, believing it encourages weeds, so the research team decided to find out how fencing affected weed abundance as well as the recovery of

fenced-off kahikatea stands in the Waikato.

The 9 remnants studied ranged in size from 1 to 10 ha and were all on the seasonally waterlogged alluvial soil typical of the Waikato kahikatea stands. They had been fenced for periods ranging up to 75 years and also included some unfenced sites that were still being grazed.

Vegetation data was collected from 2–4 plots in each remnant, representing the edge and the interior environments. Such factors as the diversity of native and weed species, the basal area (area occupied by tree stems) and the density of different size classes of trees, shrubs and ground cover were recorded and modelled against the remnant size, the plot position within the remnant and the period since fencing.

Most of the 56 adventive (exotic)

species recorded were pasture grasses and herbs found only at the edge of recently fenced remnants and their numbers were found to slowly decline in the first fifteen years after fencing. After 20 years, most of these species had disappeared, having been overtaken by taller native species.

The diversity of native species was found to increase steadily after fencing, with increasing density of small trees and saplings. Native ground ferns and shade-tolerant understorey shrubs were found in remnants that had been fenced for 25 years or more – an important trend, as they are regarded as 'indicator' plants and their reappearance showed that recovery from grazing was progressing well.

Researcher Mark Smale says it's remarkable just how much of the original native flora has survived despite

50 -100 years' of grazing. He says forest of this kind originally had about 120 species of ferns and flowering plants and 98 of these were found in the group of remnants studied. Even more surprisingly, two-thirds of these surviving species were found in remnants that were still unfenced or had been fenced for 5 years or less. The trouble is that many of the canopy and sub-canopy species will disappear and the diversity of native species decline when the existing mature trees die unless regeneration is allowed to occur. Encouragingly, the study results indicate that, because diversity still exists now, even long-grazed remnants can restore themselves once they are fenced.

Few of the most threatening native forest weeds were present in the remnants studied apart from Chinese privet. This was probably because the remnants were situated within relatively weed-free rural environments. Mark says their findings indicate that fencing within such environments does not encourage weed invasion but, rather,



Prolonged grazing has destroyed the understorey.

Photo: Mark Smale



Diverse native understorey and ground species have re-established - in this case, 27 years after fencing.

Photo: Mark Smale

discourages it and fencing alone may be enough to allow the Waikato kahikatea forest remnants to return to a near natural state.

Active control of a small suite of threatening weeds will be necessary, however, if present. Although Jerusalem cherry, a small adventive shrub that forms dense thickets under grazed kahikatea remnants, was found to naturally decline over time, a small group of persistent invasive weeds such as barberry, ivy, wandering willie, and privet will need control if they are present. The only one of these that was widespread in the Landcare study sites was Chinese privet, mainly as seedlings. It was found to decline

slowly over time in the remnants studied but given its invasive reputation, control is nevertheless recommended.

Remnant size did not affect the rate or success of recovery, the most telling factor being the length of time since fencing. Proximity to other native forest seed sources could be an important factor in recovery but the remnants studied were within close range of seed sources so could not be compared with more isolated examples to see if this was so. Further research into this is planned. A parallel study is also underway to see whether the soils under the grazed kahikatea remnants have been altered by application of fertiliser on surrounding farmland over the years and what happens to the soils after fencing off.



Photo: Mark Smale

Hen and chicken fern (*Asplenium bulbiferum*) is highly palatable to stock so its reappearance indicates good forest recovery.

**Research team:** Mark Smale of Landcare Research, Hamilton, and Craig Ross and Greg Arnold of Landcare Research in Palmerston North. For further information contact: [SmaleM@landcareresearch.co.nz](mailto:SmaleM@landcareresearch.co.nz)

## Further information

Factors other than grazing and weed competition can also influence kahikatea remnant recovery, such as the degree of exposure along remnant edges and extent to which the water table has been altered. For further guidance about managing and restoring kahikatea remnants, refer to the excellent factsheet series produced by Environment Waikato at [www.ew.govt.nz](http://www.ew.govt.nz) or Freephone 0800 800 401.

- *Waikato Kahikatea Fragments*
- *Life in a Waikato Kahikatea Forest Fragment*
- *Managing a Waikato Kahikatea Forest Fragment*
- *What to Plant in a Waikato Kahikatea Forest Fragment*
- *Waikato Kahikatea Forest Fragment Planting Guide*