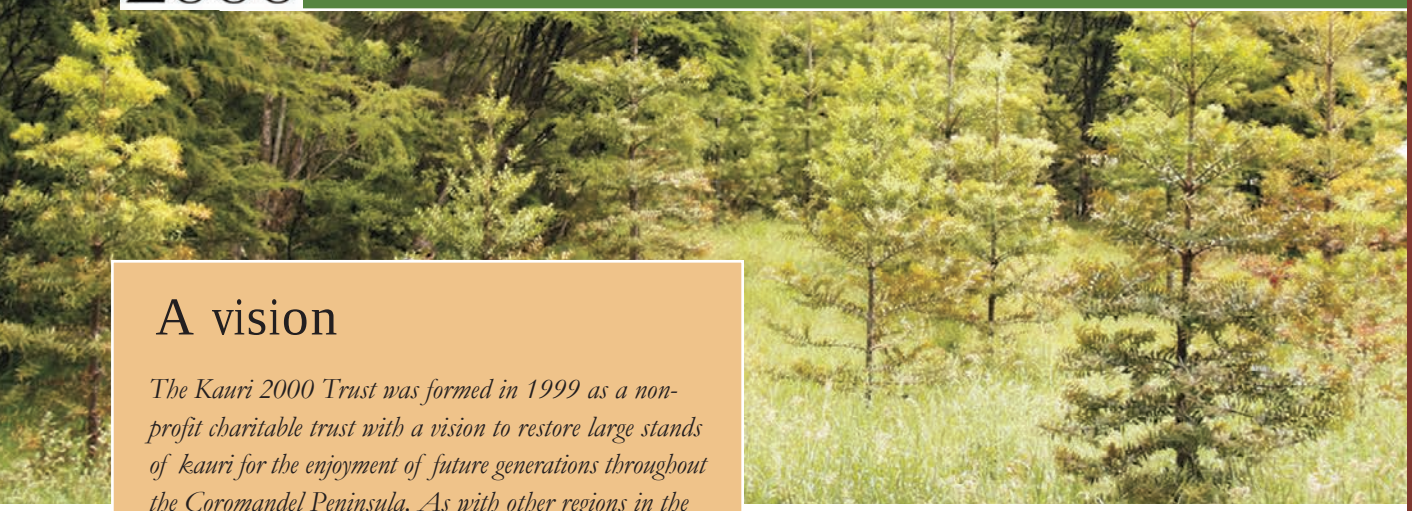
THE KAURI 2000 TRUST

plant a kauri - recreate a forest

A long term project to recreate significant stands of kauri on the Coromandel Peninsula



A vision

The Kauri 2000 Trust was formed in 1999 as a non-profit charitable trust with a vision to restore large stands of kauri for the enjoyment of future generations throughout the Coromandel Peninsula. As with other regions in the north, the Coromandel was heavily logged in the past resulting in the loss of most kauri forest.

Inspired and led by local enthusiast Cliff Heraud, Kauri 2000 evolved from the desire of local communities to celebrate the new millennium in a tangible, enduring way by recreating some of this lost kauri heritage. It is a long-term project which invites families, individuals, communities, businesses, schools and visitors to support the planting and maintenance of kauri throughout the Coromandel.

Planting new kauri trees for the future as part of Kauri 2000's 20,000th tree celebration.

Top photo: Kauri planted 10 years ago in one of the open grassed Kauri 2000 sites.

INTRODUCTION

For over a decade the Kauri 2000 Trust has seen the successful establishment of many thousands of kauri throughout the Coromandel Peninsula. A survey of the performance of Kauri 2000 plantings was undertaken as part of a national survey of indigenous plantations by Tāne's Tree Trust (refer to previous Technical Articles within Section 10 of this Handbook).

This article describes the vision and work of the Kauri 2000 Trust. The early performance of the Trust's plantings is compared with the Tāne's Tree Trust national survey of indigenous plantations. While the Kauri 2000 Trust is focused on planting kauri for future generations to enjoy as conservation forests, the principles of planting and early management are similar to planting native forest for multiple purposes and are therefore a useful case study of best practice for establishing native tree plantations.

Planting sites

With the input of forestry advisor Max Johnston, the Kauri 2000 Trust works with the Department of Conservation, New Zealand Transport Agency, the Thames-Coromandel and Hauraki District Councils and others to identify and establish planting sites around the Peninsula. Most planting sites are on publicly-owned land in the Coromandel Forest Park administered by the Department of Conservation.

Thirty-six sites have been planted over the last 12 years (Figure 1). These range from small sites such as parks or reserves with a handful of trees through to major sites where thousands of trees have been planted. The larger planting sites are typical of many reverting hill country sites in the Coromandel that have previously been cleared and burned, and now have a cover of up to 4 m high regenerating shrub hardwoods and few natural regenerating kauri.

The Trust purchases seedlings using donations from the public. The location of planting sites and trees are recorded in a database held by the Trust and every donor receives a certificate identifying where their kauri is planted. To date, 36,000 kauri have been planted.

Left: Most of the Kauri 2000 planting sites are in dense scrub where lines 4 m apart are cut and seedlings are planted at 2 m intervals along each line.

Below: Some Kauri 2000 plantations were established on open grassed sites.

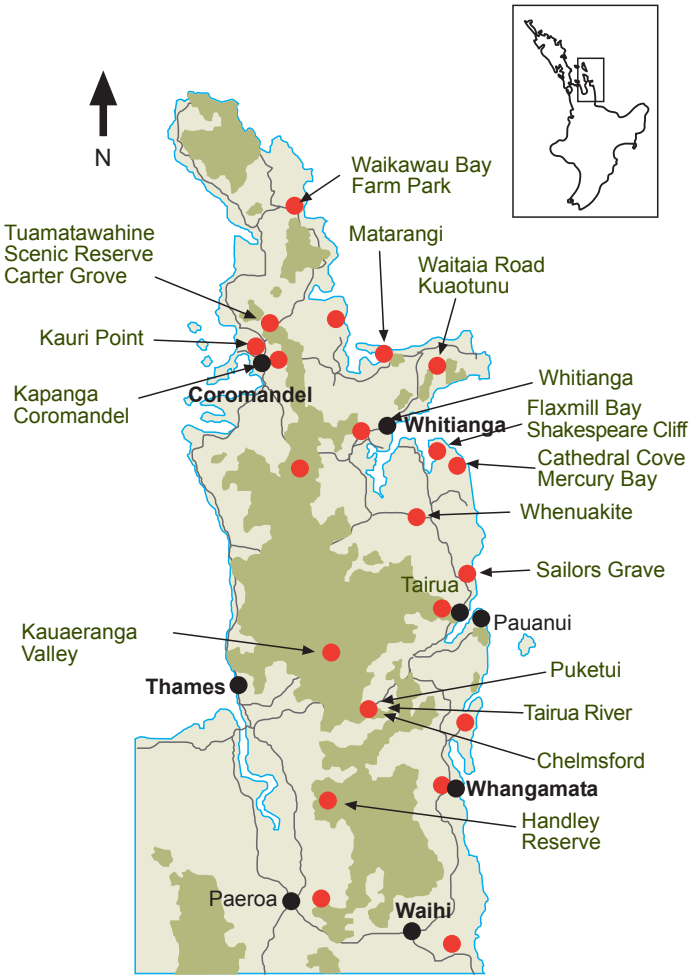


Figure 1: Location of stands of kauri planted by Kauri 2000 over the last decade throughout the Coromandel. Red dots indicate where one or more planting sites are established (map by Michael Bergin).

Establishment and management

Contractors undertake site preparation several months before planting, and fell wilding pines 1 - 3 years in advance where required. Narrow lines at 4 m spacing are cut through the vegetation using scrub bars. Eco-sourced kauri seedlings are then planted in winter at 2 m intervals (approximately 1250 stems per ha) along the lines using volunteers. Trees were spaced 4 m apart on earlier planting sites (625 stems per ha). Site preparation on sheltered grassed open sites involves spot spraying by knapsack with herbicide before kauri is planted.

Every site has a work plan including maps and block layouts. Planting sites are monitored and maintained for at least five years until the trees are well established and are not at risk of becoming smothered by invasive weeds. Weed control is carried out by contractors and usually involves cutting back overtopping fern and woody regrowth by slasher around planted kauri. On open sites, grass competition is controlled with careful knapsack application of herbicide.

All operations comply with Department of Conservation requirements. The Trust has a formal Memorandum of Agreement with DOC that is reviewed annually.

PERFORMANCE OF KAURI 2000 STANDS

Stand types

The Kauri 2000 stands can be classified into one of three stand types based on site and stand characteristics:

1. *Inter-planted stand* - kauri planted along cut lines within reverting hill country shrubland;
2. *Scattered planting* - widely-spaced kauri planted within parks and amenity areas; and
3. *Plantation* - kauri planted on open sites at a stocking greater than 500 stems per ha.

Most kauri were planted as inter-planted stands reflecting the focus of the Trust to restore kauri forest on typical hill country sites throughout the Coromandel Peninsula.

Survival

There continues to be high survival of planted kauri at most sites. Estimates range from 70-90% for kauri inter-planted in regenerating shrubland based on original stockings. For kauri established in plantations or as scattered stands on open sheltered sites, survival is consistently over 90%.

Growth rates

Growth rates vary from site to site reflecting environmental conditions and stand types. Kauri planted on sheltered, fertile ex-pasture sites and parks have annual growth increments exceeding 5 mm diameter and 40 cm in height. Growth in kauri planted along lines cut in scrub covered hill country is slower at only 1-2 mm mean annual diameter increment and 20 cm mean annual height growth, which is comparable to naturally regenerating kauri on similar sites elsewhere (Barton 1999; Bergin and Steward 2004).

A 3 m high kauri sapling planted in a cut line that has benefited from early weed control.

This is an ideal environment for line-planted kauri where surrounding scrub provides side shelter while full overhead light will ensure continued rapid growth.

Comparison with other planted kauri stands

As part of the recent nationwide survey of native plantations by Tāne's Tree Trust, over 60 plots were established in stands of kauri planted throughout the country, some well south of its natural range (refer to Technical Articles No. 10.1 and 10.2 within this Handbook). Plantations ranged from a few well-managed stands on sheltered fertile lowland sites with relatively fast growth rates to stands either established on harder sites or with poor management after planting resulting in compromised performance.

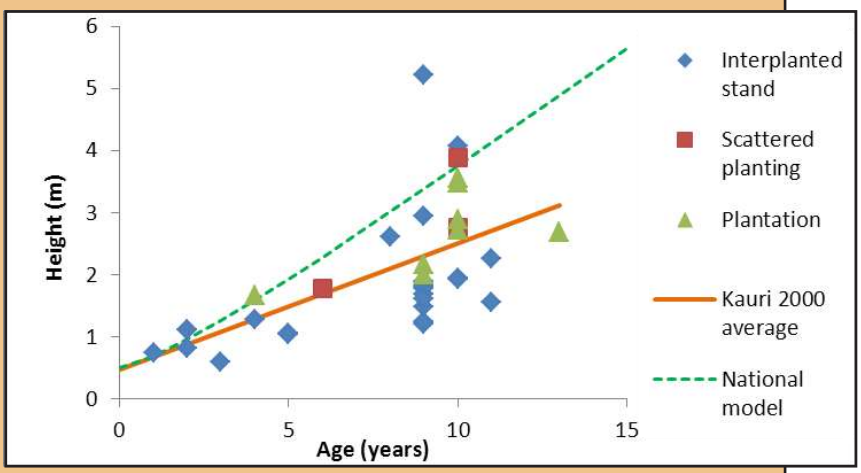


Figure 2: Height of kauri established by Kauri 2000 for the three stand types (inter-planted, scattered, plantation). The trend line for Kauri 2000 plantings is an average across all stands assessed. The average height growth modelled from all kauri plantations assessed nationwide is also shown.

When compared to the nationwide survey of kauri plantations, the height of kauri within Kauri 2000 stands averaged close to 2.5 m, compared to the national height model of nearly 4 m, at ten years after planting (Figure 2). Similarly, stem diameter growth of the Kauri 2000 stands (2 cm at ground level) was only half that of the national average. This reflects the nature of the sites, as discussed above, and is in line with similar sites elsewhere.

Ongoing management

It has been the regular maintenance of plantings by Kauri 2000 that has contributed to high survival, particularly control in early years of grass invasion on open sites and regrowth of bracken and vigorous woody shrub species on inter-planted shrubland sites. Work plans for each site with updated information provides an ongoing record of the location and management status of each plantation that facilitates efficient monitoring and maintenance.

CONCLUSIONS

Overall, the early performance of plantings by the Kauri 2000 Trust is excellent. The slower early growth rates compared to the national growth model reflect the large number of Kauri 2000 sites on the difficult hill country that was typical kauri-dominant forest in the Coromandel and other northern regions of New Zealand (e.g. Burns and Leathwick 1996). These sites are characterised by skeletal hill soils, many of which had been repeatedly burnt and eroded from decades of marginal pastoral land use. The method of inter-planting kauri within a regenerating cover of native shrub species mimics natural regeneration processes. Kauri planted on exposed sites without shelter afforded by an existing cover of shrub species would result in complete failure.

Summaries of the growth performance of Kauri 2000 plantings will be included in the Tāne's Tree Trust Indigenous Plantation Database that is currently being set up. This will be available on the TTT website with a link to the Kauri 2000 website.

Kauri recently planted at Waikawau Bay in the northern Coromandel.

Studies in natural stands clearly show that kauri suppressed by overhead shading grow very slowly (e.g. Burns and Smale 1990). With full overhead light, sapling and pole kauri grow rapidly. With the Trust's older inter-planted kauri now over 3 m in height, occasional checking to keep tops free of overtopping vegetation will ensure planted kauri will benefit from the rapid sapling and pole growth phase.

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Tāne's Tree Trust
Native Trees for the Future

Tāne's Tree Trust promotes the successful planting and sustainable management of New Zealand native trees and shrubs for multiple uses.

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