Sir David Hutchins and kauri in New Zealand

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Introduction

The kauri (*Agathis australis*), found only in New Zealand, is one of 21 species comprising the genus *Agathis* that along with *Araucaria* and *Wollemia* make up the Araucariaceae family. Mature kauri is notable for its massive almost cylindrical branchless trunk reaching over 13 metres. Tane Mahuta in Waipoua forest estimated at 1500 years old, is the largest living kauri. It has a girth of 13.77 metres, a trunk height of 17.68 metres, a total height of 51.5 metres and a volume of 244.5 cubic metres (Halkett and Sale 1986, p.173). The species is currently found in the North Island of New Zealand as far as 38ºS or approximately a line drawn from Kawhia to Maketu.

Kauri formed the basis of a spar trade from the 1820s to 1850s and efforts were made to reserve kauri forests for Royal Navy purposes when New Zealand was colonised by the British in 1840. A Conservator of Kauri Forests was appointed as early as 1841 but he was accidentally drowned and no replacement was ever made. Kauri sawmilling was an important 19th century industry. The timber was highly valued and was the one species to command colony wide sales. It was also exported in quantity particularly to Australia. The Kauri Timber Company established in 1888 which became the dominant player in the industry was Melbourne based. In 1885 Thomas Kirk the Chief Conservator of Forests estimated that kauri would be exhausted in 26 years. By 1908 the 12000 hectares Waipoua State Forest remained as the single largest area of kauri. Although heavily forested Waipoua had been purchased by the Crown from Maori in 1876 for conversion to farmland, but its relative isolation had meant that it had remained unsettled. In 1906 it had been gazetted as a state forest. Leonard Cockayne, the eminent ecologist, prepared a botanical report on the forest in 1908 in which he drew attention to its scientific and scenic value and argued for its preservation.

Existing forests legislation and other provisions in the Land Act were limited to the gazetting of forests and granting of timber licenses. There were no trained foresters, a timber famine was predicted by mid 20th century, and the solution was believed to lie in exotic afforestation. A Forests Branch of the Lands Department had been set up in 1897 but had concentrated on afforestation activity. To this might be added the growth of a forest preservation movement as witnessed by the establishment of several national parks from 1894 and the passage of a Scenery Preservation Act in 1903. The 1913 Royal Commission on Forestry recommended that 200 acres [81ha] of Waipoua forest be set aside as a 'national kauri park' and the remainder milled and the land thrown open to settlement. By 1915 the government had decided to preserve 2000 to 2500 acres [809 to 1012ha] of it as a national park and to allow the rest to be felled. Around this same time the agricultural scientist Alfred Cockayne, son of Leonard Cockayne, had published an article lauding *Pinus radiata* as 'the great timber tree of the future' (Cockayne 1914, 1). This was the situation that confronted the experienced colonial forester David Hutchins when in 1915 he accepted a brief to report on the forests of New Zealand for the Minister of Lands.

Sir David Hutchins: colonial forester

A graduate of the famous École Nationale de Eaux et Forêts at Nancy in France, Hutchins spent the early part of his career in India before transferring to South Africa in 1884 where he was involved in forest demarcation work, silviculture, and afforestation efforts particularly with eucalypts. In 1909 he prepared a report on forestry in British East Africa and subsequently was invited to inspect the forests of Cyprus for the Colonial Office. In 1914 Hutchins was part of the British Association for the Advancement of Science tour of Australia and produced a lengthy book entitled *A Discussion on Australian Forestry* that was both controversial and influential. It was, however, on the basis of his East African report that Hutchins was invited to inspect forests in New Zealand, albeit that the government was mainly interested in his reactions to their afforestation efforts. Hutchins arrived in Auckland in October 1915 and to the surprise of officials delayed his journey south to the plantations at Whakarewarewa in favour of a tour of Waipoua kauri forest. This was a harbinger of both Hutchins' growing fascination with kauri and his desire to make the case for the sustainable management of indigenous forests in New Zealand. The New Zealand 1913 Royal Commission on Forestry had also taken the view that exotic afforestation was the way forward for forestry in New Zealand. This was a position that Hutchins, as a professional forester, found astounding.

Hutchins and kauri forests

Hutchins knew of kauri before he arrived in New Zealand. He noted that his superior in South Africa, Comte Vasselot de Regné, the Superintendent of Woods and Forests had always hoped to visit the kauri forests. He also quoted a line of doggerel verse which he ascribed to forestry students in South Africa to the effect that:

> One thousand acres yearly and three million doubtful trees,
> Cost some eight thousand yearly to the wild New Zeas.
> And they don't care a tinker's d--- for the grand Kauri trees.
> (Hutchins 1916, p. 395).

In addition he had compared the qualities of kauri with the Yellow Wood (Hutchins described them as *Podocarpus thunbergii* and *Podocarpus gracilior*) of Kenya in his East Africa Report. In his report on Australian forestry he further compared the loss of red cedar (*Toonia ciliata*) in Queensland to 'the destruction of kauri in New Zealand, a national scandal, and a blot on the civilization of the 19th century' (Hutchins 1916, p. 291). Hutchins prepared a commentary on the Royal Commission on Forestry and this was published as an appendix in *A Discussion on Australian Forestry*. In this he expressed grave doubts about the official policy of meeting future timber needs from exotic plantations particularly in the absence of any professionally trained forestry advice.

> The story of the destruction of the Kauri forest is one of the saddest features in the history of this fair earth. There is nothing in this report to show that it is necessary or sound economically, or that it will not go down to history as a dark blot in the story of Anglo-Saxon colonisation (Hutchins 1916, p. 395).

That kauri should attract his attention once he arrived in New Zealand is hardly surprising.

Hutchins on kauri management

Hutchins spent from 23 October to 27 November 1916 in Waipoua forest largely engaged in forest demarcation work. This involved establishing the forest margin marked by some 25 permanent beacons enclosing a forest area of 29,830 acres (12,072 ha), including some cleared land, where the soil was poor but the forest was deemed capable of regeneration. In addition, he identified location for permanent forest stations (Figure 1). Hutchins with his Australian experience of recent European settlement fresh in his mind regarded forest demarcation as the essential first step towards the establishment of scientific forestry in New Zealand. Shrewdly he also used the discussion about demarcation as a springboard to discuss the subsequent management of the trees

in Waipoua kauri forest. His focus on Waipoua was strategic; not only were kauri an iconic species, but they were regarded as likely to be felled to exhaustion within 20 years. The remainder of the report discussed the stock of trees and Waipoua as a stand of trees, milling, natural regeneration, fire, forest organisation, working plans and concluded with recommendations for other kauri forests.

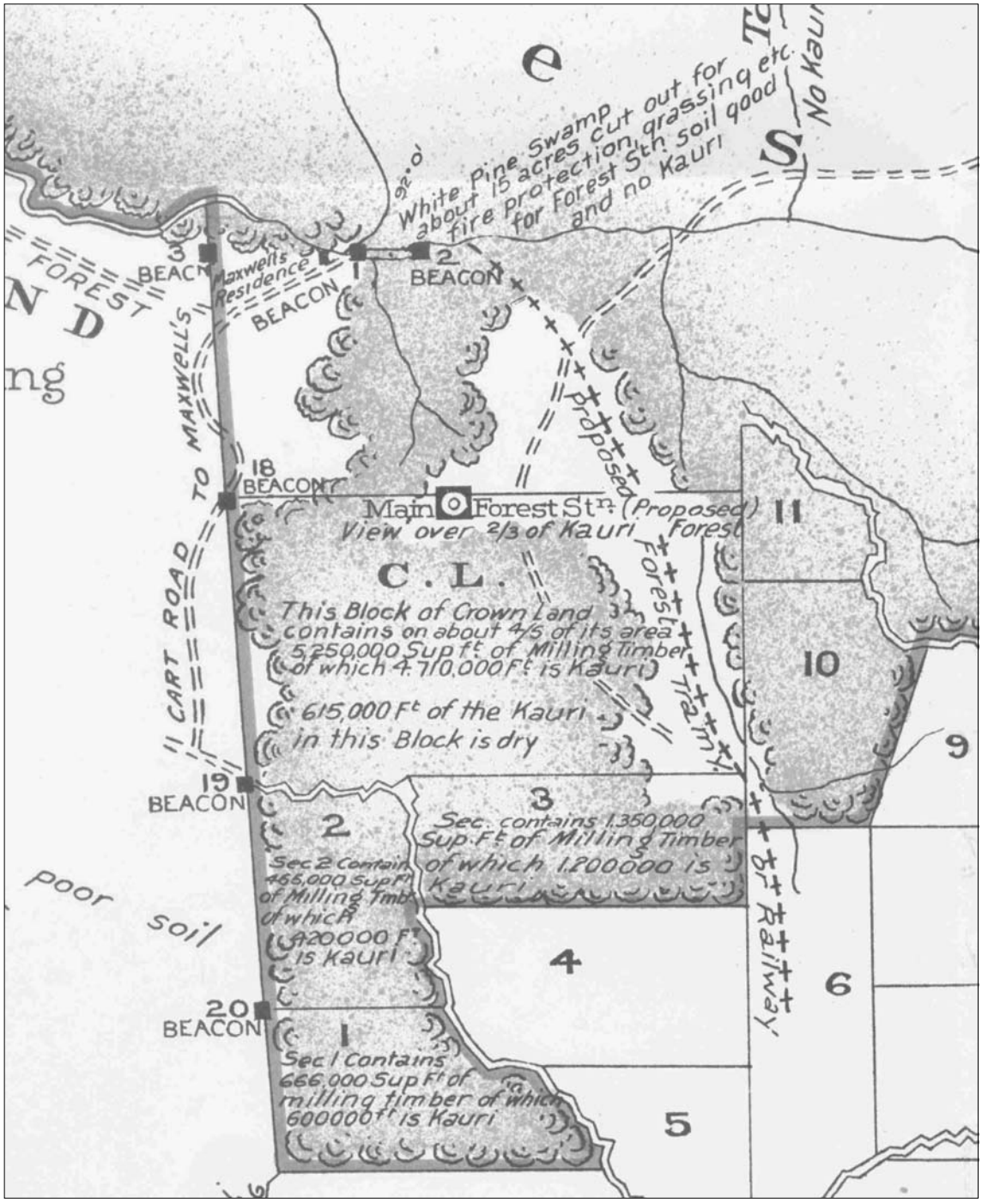

Figure 1: Part of Hutchins' 1916 map showing the demarcation line around a portion of Waipoua Kauri forest. This part shows how he proposed extending the demarcated boundary to include some Kauri forest on adjacent Crown Land. The site of his main forest station where it could overlook most of the forest is also shown on this portion of the map.

Kauri he lauded as the 'biggest timber tree in the world' (Hutchins 1918, 17) but most of the Waipoua kauri he estimated at 5000 to 6000 cubic feet [141 to 170 cu m] and at a royalty of 6/8d per 100 super feet believed they were worth about £200 each. Kauri did not grow in pure stands and Hutchins spent considerable time discussing the potential of other timber species, such as taraire (*Beilschmiedia tarairi*) and kamahi (*Weinmannia racemosa*). Milling he considered ought to be carried out by the government rather than private millers, the latter following old habits would he believed create a fire hazard. Hutchins also asserted that Waipoua was a virgin forest and that 'it is a forestry axiom that a virgin forest represents a capital earning nothing. It is in a state of nature wherein growth balances decay' (Hutchins 1918, 27). He had previously made this same point in his Australian report (Hutchins 1916, 109). The idle capital Hutchins calculated at a not inconsiderable £500,000. Natural regeneration was at the heart of his vision the scientific forestry. He acknowledged that natural kauri regeneration in Waipoua was 'not superabundant as in some forests, but it is suitable for nature's purposes' (Hutchins 1918, 28). Astutely he recognised that kauri was a light-demanding species and identified abundant natural regrowth on areas previously felled and cultivated by Maori as well as on burnt areas especially where manuka (*Leptospermum scoparium*) acted as a nurse plant. Other less valuable species such as tawa (*Beilschmiedia tawa*) were he believed regenerating abundantly. But he firmly believed that human intervention made it possible to greatly increase the number of merchantable species.

Hutchins observed that the wet kauri forests reminded him of areas of South African forest where elephants were still used for log hauling. He recommended letting them run wild in the Waipoua forest so putting 'the surplus animals to work, as is done in India. The old ones would be useful in forming costless paths and in keeping down the undergrowth' (Hutchins 1918, 42-43). This comment attracted attention away from his observations about more modern logging methods.

Hutchins' Waipoua report was to be read in conjunction with his more expansive *New Zealand forestry. Part 1, Kauri forests and forests of the north and forest management* (Hutchins 1919). Here he reiterated some of the points made in the Waipoua report as well as outlining more comprehensive proposals for forest management. The focus is however very much on kauri. The report was written in his characteristically discursive style drawing on classical forestry practice from Germany (via Schlich and India) and France and making a number of off hand comments about everything from the benefits to New Zealand if it had been colonized by the French to quoting Tennyson. His African and more recent Australian experiences also informed his views. Hutchins devoted some space to discussing kauri growth rates, to kauri gum and to the lessons to be learned from the felling and later burning of the Puhipuhi kauri forest.

Given the prevailing view that the indigenous forest trees of New Zealand were exceedingly slow growing this was a logical point at which to begin especially as Hutchins emphasised that the kauri still grew quicker than many of the forest trees that were being successfully managed in Europe. He also challenged the prevailing view that kauri was doomed to disappear, instead he compared them favourably with forests that were being managed in South Africa and declared that kauri with its 'robust growth and fair regeneration' was a 'tree in its prime' (Hutchins 1919, 29). The report reveals that he had made a comprehensive study of all the existing published work to that point as well as discussions with local experts and even spent some of his own time counting growth rings. He subsequently published a separate paper taking to task a local afforestation enthusiast for marshalling evidence for fast growth of exotics in order to argue that indigenous regeneration was a lost cause, when the real problem, in Hutchins' view, was the failure to distinguish between arboriculture (individual trees) and forestry (mass trees) (Hutchins 1920). Hutchins then devoted a chapter to the kauri gum trade, pointing out that it was strictly speaking a resin and a not gum, but making the case against the practice of bleeding trees because of the damage it caused. The cut out and fire swept Puhipuhi forest he considered in some detail in order to make a point about how much revenue and employment a managed kauri forest would generate and to compare the returns from forestry with those from dairying. This provided the platform for

him to outline his kauri management plan. He described three different silvicultural systems: jardinage or selection felling, group felling (which he advocated) and strip felling (Table 1).

Table 1: Silvicultural systems compared

Type	Felling system	Suitability to New Zealand
Jardinage	Thinning of the mature forest as wanted	
Group felling	Felling of trees in irregular groups	Particularly suitable for mixed stands in New Zealand
Strip felling	Felling of trees in long strips as an aid to regeneration	

Hutchins envisaged the kauri forest of the future being managed on a 100 year rotation to produce trees of about 2 feet [60cm] in diameter with a 60 foot [18.28 m] bole stocked at some 150 trees to the acre [370 to the ha] along with about 150 secondary species. This would, he calculated, amount to 1700 cubic feet per acre [151 cu m per ha]. A notable feature of Hutchins' plan was that the conversion from overmature to a fully stocked 'normal' forest would be made in a single transition phase of 100 years (Table 2). By the time the normal kauri forest had been produced—that as Hutchins noted, it was remarkable the way the figures worked out—the average age of the main crops would be 100 year, the average number of tree per acre in the main timber crop would total 100, and the average cubic content of the bole of each tree and the average production of timber per acre per year would both be 100 cubic feet quarter girth measure [8.9 cu m per ha] (Hutchins 1919, 180).

Table 2: Hutchins' proposal for forest transition in kauri forests

Period	Duration	Forest structure	Stocking
First	8-12 years	Virgin overmature forest	
Second, 'Transition' Period	100 years		Becoming fully stocked
Third	100 year rotation	Normal forest	Fully stocked

Hutchins died in late 1920 and did not see the arrival of L. M. Ellis a Toronto graduate who was appointed as New Zealand's first Director of Forests. Ellis affirmed that indigenous forest management was a corner stone of the forest policy he intended to implement. He contracted William McGregor from Auckland University College to investigate kauri regeneration in 1921. Financial and other difficulties caused the work to lapse by 1925. By the late 1920s, however, New Zealand foresters encountered problems with regenerating forests which they explained at the Empire Forestry Conference of 1928 in terms of succession theory where other forest species replaced harvested kauri. Nevertheless, kauri remained, they believed, their brightest hope for successful sustained yield management.

A Kauri Working Circle was put in place in 1942. The irascible McGregor had, however, quickly become involved in arguments with the Forest Service over the research and eventually became a leading figure in a campaign for the preservation of Waipoua kauri forest. After a sustained campaign the area was gazetted as a forest sanctuary under an amendment to the *Forests Act 19 49* in 1952. Thus Waipoua remained under Forest Service control but its sanctuary status

meant that it was to be absolutely preserved because this designation could only be lifted by Parliament. The episode left a bitter taste to the Forest Service where it was noted that Waipoua 'had been permanently sterilised and proclaimed a forest sanctuary' (Allsop 1973, 37).

By 1973 kauri policy restricted harvesting to a small annual cut of 870 cu m from Puketi forest, and this ceased once a threatened bird population of Kokako (*Callaeas cinerea*) were discovered in the forest. Kauri management research continued into the 1980s with later research tending to confirm Hutchins' original management proposals (Table 3).

Table 3 Proposed rotation periods for kauri,1923-1980

Year	Authority	Rotation (years)		Diameter	
1919	Hutchins	100		2 ft	60 cm
1923	McGregor	135-150	(7 ft girth)	2 ft 3 in	68 cm
1942	NZFS	150-200			
1980	Barton & Horgan	80			50 cm

By the end of the 1970s the environmental movement had won the political contest for indigenous forest preservation as opposed to sustained yield management (Halkett and Sale 1986). From the mid 1970s however the thrust of kauri policy turned towards the perpetuation of remaining areas where timber production was only an incidental aim (Halkett and Sale 1986). Environmentalist opposition to any form of harvesting from state indigenous forests intensified during the 1970s until in a series of staged retreats from the forest accord of 1987 to the decision to end Timberlands West Coast Beech management scheme in 2000 the government exited indigenous production forestry. This played out slightly differently for kauri. With most of Northland kauri under the stewardship of the Department of Conservation, environmental group Forest and Bird mounted a campaign for the creation of a kauri national park (Orwin, 2004). Local Maori were unenthusiastic as land claims in the area had not been resolved by the Waitangi Tribunal. In 1998 the Forest Restoration Trust in conjunction with Te Roroa purchased land at Waipoua and began planting kauri. The Department of Conservation in its Conservation Management Strategy for Northland meanwhile has continued to identify the Waipoua-Waima-Matrua forests as a 'priority' area as part in the proposed the Northland Kauri National Park in Northland.

David Hutchins was buried in Karori cemetery in Wellington, New Zealand. The headstone inscription in part reads 'An acknowledgement of the important services by him to Empire Forestry by members of New Zealand & Australian Forestry Leagues, Relatives and Friends who mourn his death'. The Headstone which stands a metre high features in relief a stylised kauri tree (p. 52).

Conclusion

Hutchins left a complex legacy both as a promoter of scientific forestry in New Zealand and as a forester who undertook the first professional forest demarcation at Waipoua and sketched out the rudiments of a management plan for kauri. He raised the profile of scientific forestry at a crucial time when moves were afoot to create a separate Forests Department and employ professionally qualified staff. But he also divided some of the forestry enthusiasts by making bold claims and being critical of local scientists, officials and politicians, not to mention by actually taking several years to complete a task that officials, admittedly overly ambitiously, expected him to complete in a month. Hutchins did, however, recognise the strategic importance of developing scientific state forestry around kauri. Not only was it the premier New Zealand timber tree but it was considered that supplies would soon be exhausted. In addition the kauri had iconic status at a time when tourism was growing. To show how kauri might be perpetuated through the application of

scientific forestry would have made it much easier to implement similar schemes for the Podocarps where the rotation times would have been much longer.

Hutchins' reports had a strong utilitarian undertone that was rather lost sight of in his forceful advocacy of scientific forestry. He went to considerable lengths to make the case that on some land forests were the best crop that could be grown and that with careful management they could be made to yield a considerable amount of timber in perpetuity, amounting to more than competing agricultural uses would produce. He also paid attention to the cost of continuing to neglect forests in terms of the losses to the local economy. Yet his views were not entirely utilitarian for with an eye to tourism, he would have protected some of the mature kauri forest for scenic purposes. He was a keen observer and his views about the importance of light and the role of nurse plants in regeneration were borne out by a later generation of kauri researchers.

Hutchins' plans to manage kauri sustainably on a 100 year rotation were never implemented. Subsequent work always pointed to possibilities for kauri management. The Forest Service was too stretched financially and in terms of personnel to give a high priority to sustained research into kauri regeneration, and from the late 1940s the debate about the future of the kauri forests had been won by forest preservationists, though this was not clear until the 1970s.

If Hutchins' kauri management plans had been implemented in 1920 the transition phase would now be about three quarters complete. The success or failure of his scheme by now would be easier to assess but in either case the kauri forest would be much different with the old growth trees having been converted to 'rickers' of about 30 centimetres diameter. A period of 100 years is little in the life span of a kauri tree, and well within the rotation period of the European and colonial forestry traditions in which Hutchins was trained. However, in 1919 it was a mere 79 years since New Zealand had become a British colony. The environmental and social transformations that and taken place in this relatively short period of time had been great and to ask New Zealand politicians to think in terms of a 100 year transition rotation and then another hundred years for a rotation of the fully stocked kauri forest was too much of a challenge of faith.

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Further Reading

Allsop, F. 1973. *The First Fifty Years of New Zealand's Forest Service*. Wellington: New Zealand Forest Service Information Series No 59.

Barton, I. 1975. 'The Management of Kauri Forests: A Historical Review of Government Policy and a Proposal for the Future'. *New Zealand Journal of Forestry*, 2, pp. 89-106

Barton, I. and Horgan, G. 1980. 'Kauri Forestry in New Zealand A Protagonists Viewpoint'. *New Zealand Journal of Forestry*, 25, pp. 199-216.

Bergin, D. and Steward, G. 2004 *Kauri: ecology, establishment, growth, and management*. Rotorua:, Forest Research, New Zealand Indigenous Tree Bulletin No 2.

Cockayne, A. H. 1914. 'Monterey Pine, the great timber tree of the future'. *New Zealand Journal of Agriculture*, 8, pp.1-26.

Ell, G. 1996. 'What ever happened to the Kauri National Park?' *Forest and Bird* No. 281, pp. 28-31.

Halkett, J. 1983. 'A Basis for the management of New Zealand kauri (*Agathis australis* (D.Don) Lindl.) forest', *New Zealand Journal of Forestry*, 28, pp. 15-23.

Halkett, J. and Sale E. V. 1986. *The World of the kauri*. Auckland: Reed Methuen.

Hutchins, D. 1916. *A discussion of Australian forestry with special references to forestry in Western Australia*. Perth: Government Printer.

Hutchins, D. 1918. *Waipoua Kauri Forest, its Demarcation and Management*. Wellington: Department of Lands and Survey.

Hutchins, D. 1919. *New Zealand forestry. Part 1, Kauri forests and forests of the north and forest management*. Wellington: Department of Forestry.
Hutchins, D. 1920. 'Rate of Growth of Trees in Relation to Forestry. A Criticism of Mr Maxwell's paper'. *New Zealand Journal of Science and Technology* 3, pp.1-7.
Orwin, J. 2004. *Kauri Witness to a Nation's History*, Auckland: New Holland.