

# THE MANAGEMENT OF KAURI FORESTS: A HISTORICAL REVIEW OF GOVERNMENT POLICY AND A PROPOSAL FOR THE FUTURE

I. L. BARTON\*

## *Abstract*

*The history of government and national attitudes toward kauri forestry in New Zealand from the early 19th century to the present is examined. The most serious shortcomings have been the inability to recognize that kauri management may have a place in New Zealand forest practice, and the stop-go attitude toward research which has held back any real progress.*

*The Government's "New Kauri Policy" is discussed and suggestions made for its better implementation.*

## INTRODUCTION

In the Director of Forests' report of 1960 (A.J.H.R., p. 18) we read: "No national activity in the whole history of New Zealand has received so much lip service as indigenous forestry. . . ."

This paper is an attempt to review government policy on kauri management. It begins when kauri was king and supplied most of the timber for the infant colony. At that time there was so much timber that no one ever thought it would run out. However, a little over one hundred years ago the first notes of caution were sounded, although it took fifty years more before much notice was taken and by then it was almost too late for the indigenous forests of New Zealand. Even when the Forest Service was set up in 1919 and commenced a definite policy of forest protection the attitude toward the indigenous forest had a curious ambivalence. On one hand, it was thought that the native forests could not be managed and were thus not worth considering on economic grounds. On the other hand, active, albeit sporadic, attempts were being made to learn how to manage these forests. This attitude has persisted and the net result, as far as kauri is concerned, has been a stop-go policy which has done little to produce a workable system of kauri management. To make such a long-term project viable it is essential to maintain a steady impetus.

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\*Forester, Auckland Regional Authority, Hunua, Papakura, RD 3.

Because of the early, wasteful use of indigenous forest and because foresters have been unable to learn how to manage these forests, or grow them rapidly, an exotic species, *Pinus radiata*, has become the country's most important timber tree. While the development of a huge industry, based on *P. radiata*, is essential in order to supply the nation's requirements of wood, it is also essential to define the place of the indigenous forests. What part should kauri, which can virtually be regarded as New Zealand's national tree, play in the forestry scene? It is not just a question of economics, for kauri forests will never be as productive as pine forests. Rather it is on grounds of specialist timber production, of historical, traditional, aesthetic and recreational values that the practice of kauri forestry should be based.

### THE UNCONTROLLED YEARS

When the European first set foot in New Zealand, he generally regarded the forest as an impediment toward the establishment of farms. Because of this, productive and valuable forest was often indiscriminately destroyed by land-clearing fires. To begin with, kauri fared slightly better than other species since it grew on poorer land less likely to be cleared for farming, or on land owned by sawmillers who were exploiting the timber. This state of affairs did not continue for long, and when kauri gum became a much sought after commodity the forests were often fired by careless diggers burning off areas of adjacent scrub, and in some cases even the mature forest, in order to get at the gum (Hutchins, 1919).

The first to query the tremendous forest waste was Ferdinand von Hochstetter (1867) who deplored the devastation of New Zealand's forests. Using the evidence provided by Hochstetter's book, T. H. Potts moved in the House of Representatives in 1868 (N.Z.P.D. 1868, p. 188) "That it is desirable Government should take steps to ascertain the present position of the forests of the Colony with a view to their better conservation". Major Heaphy, V.C., supported the motion and commented on the universal destruction of kauri saplings and poles when the forest was logged for larger trees. Speaking against the motion, Mr Barff did not want any restrictions placed on the removal of forest as this restricted settlement. He was obviously a proponent of the "settlement at all costs" attitude which was chiefly responsible for the mismanagement of New Zealand's forest estate at this time. Mr Stafford drew attention to the problem of obtaining support from the Provincial Governments on any moves to restrict forest exploitation. The Provinces had a vested interest in removing the forests quickly in order to build up their populations, and most important of all they controlled the "wastelands of the Crown" which

included the forests. This was to prove a major stumbling block when the Premier, Sir Julius Vogel, introduced the 1874 Forests Act.

That the Provincial Governments were not interested in forestry can be seen by perusing the Auckland Provincial records (J.A.P.C.) between 1850 and 1875. Despite the fact that the prosperity of the Province at this time depended to a very large degree on kauri timber and kauri gum, these products are seldom mentioned in the official record.

Following the 1868 debate several attempts were made to improve the control of the nation's forests (Coughlan, 1964) but all appeared to founder on Provincial intransigence. Vogel was the virtual ruler of New Zealand for a decade\* (Burdon, 1948) but it was only as Premier in 1874 that he was successful in establishing a Forests Act. Captain Inches Campbell-Walker, of the Indian Army, was appointed the first Conservator of Forests and with the help of Thomas Kirk he travelled the country collecting background data (Brown and McKinnon, 1966). His report was presented to Parliament in 1877 recommending for kauri that "the Government should buy tracts of poorer land off which the large kauri had been worked in order to conserve the young growth for future supplies of this valuable timber" (Campbell-Walker, 1877). Captain Campbell-Walker also read two scientific addresses while in New Zealand. In one of these (1876) he commented on the popular error that New Zealand forests could not be reproduced naturally; foresters in other countries, faced with similar situations, had managed to obtain natural regeneration through a shelter wood or a selection system of cutting and the same result could be obtained in New Zealand forests. Kauri was one of the species that he considered could be managed on a sustained yield basis.

The first Forests Act did not last long. Owing to provincial agitation and Vogel's absence from the country, the House passed a repeal bill in 1876. Although it failed to pass in the Upper House, the Government got around this set-back by omitting to vote any money for forestry purposes and the Act more or less lapsed.

Some people continued to emphasize the need for proper forest management, among them Thomas Kirk and a retired French forester, A. Lecoy, but the Government showed little interest in reviving the Act until Vogel's return from England in 1884. In June 1884 the second Forests Act passed through parliament, and a Forestry Branch of the Crown Lands Department was set up with Thomas Kirk as Chief Conservator.

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\*He was Premier only from May 1873 to May 1875 and February to June 1876.

Kirk could clearly see the end of kauri timber supplies and in order to help conserve these advocated an export duty on bulk timber. His main effort was the planning of a nursery and school of forestry at Whangarei. The school never started but the nursery did. One of the species grown was kauri but there is no record of it or where these trees were planted. In 1887, in the midst of a recession, the Stout-Vogel Government was defeated and in the subsequent retrenchment the infant Forestry Branch was dispensed with. Kirk, like his predecessor Campbell-Walker, was paid off and spent the rest of his life in reduced circumstances (Brown, 1968).

Over the next ten years the destruction of the kauri forests went on at an increasing pace. Despite the fact that Kirk had persuaded the Government to retain the services of a ranger at Puhipuhi this great forest was almost all destroyed by fire in 1887, reputedly by gum diggers wanting to bare the ground (Hutchins, 1919). Also during this period it was Government policy to dispose of isolated areas of forest for settlement (A.J.H.R. C1, 1891, p. 4); otherwise they were invariably burnt when adjacent land was being cleared. This was especially so with the relatively inflammable kauri. By 1893, it was estimated that there was only half a million acres of kauri forest remaining, but the fires continued and this despite the appointment of three Lands Department rangers in the north. In 1894 (A.J.H.R. C1, p. v) further kauri was burnt at Puhipuhi and also at Tairua. Opinion at this time was "that the only thing to do with kauri was to cut it down and sell it before it gets burnt" (A.J.H.R. C1, 1894, p. v). The following year 21.7 million board feet of fire-damaged kauri at Tairua was sold, but the burnt forest at Puhipuhi had to await the advent of rail in 1895 before it was salvaged. The area was then sown with grass (A.J.H.R. C1, 1896, p. vi).

### THE BEGINNING OF REFORM

In 1891 there occurred an event which probably resulted in the salvation of New Zealand; and this included the remainder of her forests. After more than twenty years of muddled government during which the country had twelve Premiers and seventeen separate governments, the Liberals, under Ballance and Seddon, took office and were to hold power for the next twenty years.

In 1896 the Government called a Timber Conference at which Seddon spoke out against the practice of backblock settlers destroying good timber in their efforts to clear the land. "I would sooner help the settler get out the logs to ensure that they would be put on the market and used rather than have a slur cast upon the colony by the indiscriminate felling and burning of our valuable native timber for which future generations will blame us" (Simpson, 1973). Another

person who spoke was G. S. Perrin, Conservator of Forests, Victoria. Because of the great deal of conflicting advice and evidence arising from the conference, the Government subsequently asked Perrin to advise them on the forestry question. Perrin's report was very critical of the situation in the kauri forests. In urging the revival of the work done by Kirk he criticized government policy for allowing the rapid and indiscriminate denudation of the kauri forests and the species' probable extinction. He strongly criticized the apparent inability of the Government to control the activities of the gum digger, credited with being the major cause of the destructive fires occurring in Northland. Also to blame for fires was government policy in permitting settlement and land clearing fires so far in advance of the saw-mill (Perrin, 1897).

One result of the 1896 conference was the increased pace of reservation of forest land, and the Government's realization that the indigenous timber supplies of the country must inevitably run out. This led in 1896 to the establishment of a Forestry Section within the Lands and Survey Department under the able leadership of the Chief Forester, H. J. Matthews. This group established an excellent base for New Zealand's exotic forest industry but had little to do with the native forests. The section did attempt to grow some indigenous species for forestry planting, notably totara and puriri, but these failed. Kauri does not even appear to have been tried and no reason was given for this.

There were various estimates made at this time as to the volume of kauri timber still remaining. In 1901, the figure was put at 1 250 million super feet which at the current cutting rate would last until 1919 (A.J.H.R. C1, 1901, p. ix). In 1902 another estimate was made at 2 709 million board feet, which would last until 1925 (A.J.H.R. C1, 1902, p. ix). Then in 1904 more figures were produced and these came to 1 112 million super feet (A.J.H.R. C1, p. xx). This last estimate was reasonably accurate taking into account the quantities cut since then, plus the volume standing today, less the estimated annual increment of the older stands.

As early as 1880 (A.J.H.R. C2, p. 4), it was noted that kauri was regenerating vigorously. At this time, however, cattle, fire and the rolling of big logs during logging operations were against the survival of the young plants. In 1905 (A.J.H.R. C1, p. 74), Matthews drew Government's attention to the large quantities of regeneration in the Waitakere ranges, at Whangarei and at Puhipuhi. He proposed to select recent kauri cutover areas and fence them to prevent the entry of stock. Although the scheme was approved it does not seem to have been proceeded with and was not reported on subsequently.

In 1908 (A.J.H.R. C1-B, p. 12) Matthews considered that most indigenous trees, with the apparent exception of totara, grew

too slowly to be a commercial proposition. It is difficult to know how he arrived at this conclusion since no attempts had been made to grow kauri and no measurements of growth had been made on naturally grown trees. Even totara fell from grace in 1909 (A.J.H.R. C1-B, p. 28) and no further plantings were made.

In 1911 Kensington produced a comprehensive report on State afforestation in New Zealand. Various reasons were given as to why indigenous species should not be grown. About kauri it was said that "it takes 600-3000 years to grow to full size, is very inflammable and its growth and preservation is a matter of considerable difficulty". It was also conceded that, "there is no pine in the world superior for all round use".

General reasons for not growing natives were:

- (1) Their long growth period.
- (2) Their surface-rooting habit and thus proneness to wind damage.
- (3) The requirement of their seedlings for shade.
- (4) The fact that exotics reach maturity in one-quarter to one-tenth of the time.

The report concluded that "it is out of the question to renew indigenous forests for future commercial purposes, except to a very limited extent and all that can be done is to conserve the remaining supply and make it last as long as possible". The above statement, made with little if any scientific support, has coloured the attitudes of foresters ever since.

The 1913 Royal Commission on Forestry (A.J.H.R. C12) took the same attitude toward indigenous trees and one of the opening statements was: "without exception the (indigenous) timber trees are of much slower growth than those used in forestry operations the world over and are therefore unsuited to forestry purposes". This statement is probably true relative to *Pinus radiata* but may not be correct in relation to some other introduced timber species. Furthermore, it was made at a time when no accurate information was available on the growth rate of any indigenous species.\*

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\*Later in 1913, T. F. Cheeseman published evidence which suggested that kauri had a mean growth rate of 0.5 cm diameter annually (10 rings per inch of radius). Subsequent checking reveals that Cheeseman made an error in calculating this figure and that 0.6 cm diameter per annum was more correct. He discovered naturally-established trees which grew as fast as 0.7 cm diameter per annum, while one cultivated tree that he measured was increasing its diameter by 1.0 cm each year.

The 1913 Commission's main achievement was to highlight the need for increased exotic planting in order to supplement the fast dwindling indigenous resource. Delegates' attitudes to indigenous forests were extremely ambivalent. Although Cockayne (1908) had earlier advocated that Waipoua be created a National Park in order to preserve the last large area of mature kauri, most speakers before the Commission, including James Trounson, wanted Waipoua felled and converted to farms. Only Alexander McColl, an Auckland timber merchant advocated the retention of Waipoua and its management on a sustained-yield basis, an idea expertly advocated a few years later by Hutchins (1919).

### THE STATE FOREST SERVICE

Although the Commission of 1913 was meant to foreshadow the beginning of a separate Forestry Department, the 1914-18 war intervened and nothing further was done until 1919 when the State Forest Service was set up with Sir Francis Dillon Bell as Commissioner. Until the arrival in 1920 of the first Director of Forests, L. MacIntosh Ellis, the Secretary of the new Department, E. Phillips Turner, acted as Head of Department. In 1919 (A.J.H.R., p. 7) he commented on the growth rate of native trees, saying that Cheeseman was the only one to have worked in this field and then only with kauri. Turner thought that "it could be reasonably assumed that the rate of growth of all indigenous trees . . . can be accelerated by the application of silvicultural treatment". He appointed a research officer to the staff who was to investigate growth rates of indigenous species (A.J.H.R. 1920, p. 5).

In 1918 Hutchins reported on the demarcation of Waipoua forest and this was rapidly followed by his book *Kauri Forests and Forests of the North*. A forester of long experience, Hutchins was convinced that the remaining kauri forests could be profitably managed on a sustained yield basis. It is interesting to note that this book later became the "bible" of one of the few practical kauri foresters this country has even known, Rudolf Hohneck.

On his arrival in 1920, Ellis' first task was to produce a forest policy (Ellis, 1920). Section 8 of this states the necessity for: "The acquisition and dedication to forest management of further indigenous forest areas, sufficient to justify a sustained yield management that will satisfy the timber needs of the country". The basis for proper management of the indigenous forests was thus set. Whether it could, or would, be put into practice was another matter. However, the Forest Service began well in this field by appointing people to undertake the necessary research. One of these was a young graduate of Auckland University, W. R. McGregor, M.Sc., who was retained "to study the life history of the kauri and the ecology

of the northern forests" (A.J.H.R. 1921, p. 9). His early findings indicated the need of kauri to regenerate under shelterwood, and showed that successful regeneration depended upon residual forest being protected from animals and fire. Reports of McGregor's progress appeared each year until 1925 (A.J.H.R. 1922, p. 9; 1923, p. 13; 1924, p. 11; 1925, p. 19). He had a wide range of experimental work set up and was collecting information on the light requirements of kauri as well as its growth rate. It was his opinion that kauri would increase its rate of growth under management and he considered that a diameter of 70 cm could be obtained in 135 to 150 years. He was working under a considerable handicap, as evidenced by several references in the reports to the shortage of money and assistance. Unfortunately, his final report, supposed to have been received in 1925, was never published and no further reference to McGregor appears in any subsequent reports.

It is a great pity that his findings were not published since he had obviously accumulated some useful data but no doubt much of his knowledge was subsequently used in the successful attempt to have Waipoua forest created a sanctuary (McGregor, 1948).

In 1926, Ellis reported (A.J.H.R. p. 2) that the kauri forests were to be protected against fire and trespass, that ripe lumber crops were to be marketed, and that silvicultural systems were to be applied to achieve continuous production. Also at this time experiments were commenced to see if kauri could be tapped for resin without harming the tree. Hutchins (1919) considered that this could be done if care was exercised. However, presumably the trials were not successful for, although no report was published, the bleeding of kauri on Crown land was banned at this time.

In 1928 the British Empire Forestry Conference was held in New Zealand and the third resolution of this meeting urged the "necessity for extending silvicultural research [into indigenous species] to the utmost extent possible" (A.J.H.R. 1929, p. 15). The resolution also stated that when this research had been completed a decision should be made as to the extent of perpetuation of indigenous species or their partial replacement by faster growing exotics. As a result of this resolution, the Forest Service decided to "stabilize and accelerate this important section of forestry work", namely, indigenous research. One of the ways in which this was to be done was by the setting up of a research station at Waipoua (A.J.H.R. 1930, p. 2). The station had two aims: to study the condition of the natural forest, and to see how this could be improved by the employment of scientific management. During the next two years much was done on the first part of the project, and one significant fact to emerge was the quantity of dead and dying kauri contained in the forest (A.J.H.R. 1932, p. 8).



1933 was 1887 all over again. The recession of the period brought retrenchment and many Forest Service activities were curtailed, among them kauri research at Waipoua. The Department remained optimistic, however, and obviously intended to continue with kauri management as evidenced from the Director's report of 1934 (A.J.H.R. p. 2). "The conversion of the 80% of virgin forests that are overmature into healthy growing stands . . . producing timber . . . will necessitate silvicultural management over a long period, probably 150 years. . . . Experience in countries where forestry has been practised over a period of several centuries indicates that exotic species have definite limitations and for this reason the national policy must envisage the management of indigenous forests for the maximum . . . production of timber. . . . Kauri forests are to be managed to encourage the growth of mature trees and to secure the re-establishment of young growth. By no other means can kauri be preserved to posterity. If further neglected the over mature trees will continue to decay and die . . . until ultimately kauri will be replaced by a climax succession of . . . broadleaved species. . . . Therefore . . . it is the intention of the Forest Service to bring the whole of the national kauri forests under management plans which will ensure their perpetuation".

#### MANAGEMENT PLANS FOR KAURI FORESTS

In 1935 (A.J.H.R. p. 3) the Government approved plans for the regulation of the amount of kauri cut. Over the next few years progress was made toward getting the kauri working plan prepared and it was finally put into operation in 1941 for a period of five years. This was the first plan to set down guide-lines for the management of any indigenous forest (Thomson, 1952). It was basically a "regulation of the cut" plan and although it contained proposals for the growing and planting of kauri seedlings to supplement natural regeneration very little was subsequently done in that field. Some releasing of kauri regeneration was carried out in 1942 (A.J.H.R. p. 5) but this work was very largely held up by the war. The war caused other problems, too, since the prescribed cut in the working plan had to be exceeded in order to supply wartime boat-building requirements. However, the control exercised by the plan did effectively reduce the amount of kauri cut.

1937-41: 33.7 million board feet

1942-46: 15.2 million board feet

1947-51: 7.5 million board feet

In the Director's report of 1938 (A.J.H.R. p. 4) the statement was made that "forests carrying good stockings of . . . immature timber should not be logged except under strict silvi-

cultural control. Thus conservation should be the keynote of indigenous forest policy and must be considered a vital factor in the early development of silvicultural technique". If this policy had been strictly enforced it would have modified much of the later criticism made of Forest Service activities in indigenous forests.

By 1939 agitation for the preservation of mature kauri forests was gaining momentum and the Director pointed out (A.J.H.R. 1939, p. 3) that the locking up of large areas of kauri forest was against the Department's policy which was multiple-use management. Owing to the intervention of the war nothing came of these early protests but they were to gain much more force a decade later.

In 1945 (A.J.H.R. p. 6) the Director's report noted that kauri was not regenerating very well in stands recently cut over. Waipoua nursery had been established in 1943 and it was decided to use plants from there to supplement regeneration. Unfortunately, many of these did not survive owing to the exceptional dryness of the next two summers. The releasing of regeneration began again in 1946 when work started in Great Barrier forest. But the major investigational effort of the immediate post-war era was the National Forest Survey, the main aim of which was to discover how much indigenous timber was left in New Zealand.

By 1952 it was clear enough; instead of the 32 000 million board feet believed present there was only 6 000 million board feet (A.J.H.R. 1952, p. 8). Two results of this discovery were that it speeded the acceptance of exotic timber for an increased range of uses, particularly house building, and it emphasized the need for increased research into indigenous forest problems.

### CONSERVATION VERSUS MANAGEMENT

Another force was becoming active in the community again. While the Director of Forests was reporting (A.J.H.R. 1947, p. 10) on the definite silvicultural possibilities for kauri, and that large areas of forest were to be acquired to ensure further supplies, there was an upsurge of interest in the conservation of kauri. This movement focused itself on Waipoua, where half of the remaining mature kauri grew, with the aim of having the forest set aside as a National Park. The leader of the campaign was W. R. McGregor who in the 1920s had spent five years studying the forest on behalf of the Forest Service. In 1952 a 9 100 hectare block of forest was declared a sanctuary, but not before a bitter fight was fought with considerable acrimony on both sides. Forest Service silvicultural methods were described as "a horrible process of forest destruction which is sickening in its detail, sordid in its deliberateness — its cold blooded naive ruthlessness — and ap-

palling in its completeness, in its devastating finality" (McGregor, 1948). The Forest Service retaliated by commenting on "the fantastically wasteful attitude of locking up 40 000 acres in a tree cemetery" (A.J.H.R. 1948, p. 22). Considerable emotion and not a great deal of logical thought was being generated. Whether the decision to lock the forest up as a sanctuary was the correct one will not be known for many years but at the time people could not have been certain that the Forest Service's proposals for scientific management would work either. These proposals sounded plausible on paper and did have a reasonable amount of research behind them, but the fact remains that they had never been tried out, even as large-scale trials. The formation of the sanctuary was a major setback for foresters because it removed so much mature kauri from potential management. The sustained yield management of the mature stands now became questionable since there would probably be an insufficient volume of legally-accessible timber left in the country to carry this out effectively.

One of the supporters of the Forest Service during the Waipoua controversy was Rudolf Hohneck who owned 360 hectares of regenerating kauri in South Auckland and was in fact managing this kauri forest to make a living. He published a series of letters and articles on kauri management in the Auckland newspapers between 1944 and 1948 and these later appeared in pamphlet form (Hohneck, 1948). Hohneck's ideas of management were further ahead than those of professional foresters and it is a great pity that his voice was not given greater heed during the argument over Waipoua — he certainly appeared to talk more sense than either of the protagonists. Describing himself as a "forest farmer" he supported himself on his block by the removal of timber, fencing material and firewood in an orderly and scientific fashion. His "bible" was Hutchins' *New Zealand Forestry* and he attempted to practice Hutchins' ideas of management in his forest. From a practical standpoint he succeeded and it is a great pity that, apart from his letters to the newspapers, he published no other information on his work.

The reason that management of kauri was not given more emphasis was probably because of the species' slow rate of growth under natural conditions. Under the heading "The Fantasy of growing Indigenous Timbers Economically" the Director of Forests described as incorrect the idea that indigenous trees can be grown as fast as many exotics. For instance, in 1951 *P. radiata* could be grown for 15c per 100 board feet, while rimu cost \$60. Both of these figures were calculated at 3% interest rates (A.J.H.R. 1951, p. 6).

The main emphasis of the Forest Service over the years had been to reduce the exploitation of the indigenous forests by

carefully regulating the cut and progressively making more exotic wood available. In 1951 (A.J.H.R. p. 5) the Director reported that the Department had "saved" 150 000 acres of the best indigenous forest from milling. In fact this policy was only postponing the day when the indigenous timbers must run out.

### SOME SERIOUS RESEARCH

Despite slow growth the Forest Service appeared to become more interested in indigenous forestry during the 1950s and the simple management procedure of reducing the cut was to be eventually superseded by more sophisticated management methods. There were probably three reasons for this. First, the Forest Service became aware during the Waipoua controversy of just how little it did know about indigenous forest management. Secondly, the *Sirex* epidemic in the early 1950s drew attention to the vulnerability of the country's exotic forests. Finally, the success the Australians were having in Queensland with the domestication of hoop pine and Queensland kauri stimulated the New Zealand Forest Service to try again.

The Director of Forests, A. R. Entrican (A.J.H.R. 1955, p. 9), in a complete reversal from his 1951 position, was most enthusiastic about kauri management and wrote in his annual report: "It is now appreciated that many of the earlier views of departmental officers on indigenous silviculture have been the result of poor interpretation and speculation and not adequately confirmed by long experiment. . . . For thirty years the Queensland Forest Service has persevered . . . with the domestication of . . . hoop pine and kauri. . . . In virgin stands most of the trees of these species are of the same slow order of growth as our own kauri. The theories held by most New Zealand foresters about our indigenous softwoods were likewise common in Queensland 30 years ago. . . . From modest beginnings various techniques have been evolved in Queensland by which kauri plantations now produce as much wood annually as many of the slower growing exotics in New Zealand. The silviculture and regeneration of indigenous species has in the past been looked on pessimistically. . . . This pessimism has rested mainly on two generalizations: the rapid growth of radiata pine outshone the merits of the tardier indigenous species, and there was no [information] about indigenous species through which . . . [their] silviculture could be understood . . . [N.Z.] foresters became used to thinking in terms of rotations of 30-40 years and the fact that foresters in the Northern Hemisphere . . . think in terms of a rotation of a century or more for major species, tends to be forgotten. . . . The results achieved [in Queensland] suggest that more attention should be given to the artificial establishment of kauri . . .

the long term nature of the work is fully realised". The above report was written after a visit to Queensland and as a result of it Entrican decided to assign seven professional officers to indigenous forest research. "Some of the best brains in the Department will devote much of their time to coping with the abstruse problems (of indigenous forest research)" (A.J.H.R. 1956, p. 9).

Despite early enthusiasm there were many problems to be overcome. Chief among these appeared to be the attitudes of Forest Service staff, in particular (A.J.H.R. 1960, p. 19) that relating to the relative ease of raising exotic tree crops [which] . . . has prejudiced government, professional and lay interests against the practicability of indigenous forest management. . . . Our agricultural pursuits are necessarily based on exotics . . . so in tree crop management foresters have undoubtedly been influenced by the national predilection towards exotics and its concomitant fatalism towards indigenous species. . . . The main evidence against native species is poor regeneration and slow growth. . . . The one common objection to this evidence is that hardly anyone has attempted to scientifically test these conditions. . . . Supposedly this is why overseas professional visitors have almost invariably described the Forest Service attitude towards indigenous forestry as one of *defeatism*".

Much valuable work was being done in kauri research at this time and the officers concerned "were exploding one myth of philosophical speculation after another" (A.J.H.R. 1960, p. 20). At Waipoua, Morrison (1950, 1955) was experimenting with methods of raising kauri seedlings in the nursery and then planting them out. He was just beginning to break through in this field when the operation was curtailed in 1960. If his work had been allowed to continue into the era of plastic plant containers, a great deal more would have been achieved, as it has since been proven that kauri seedlings can be produced cheaply and effectively by these methods (Barton, 1974).

Working on Great Barrier and later at Russell, Lloyd was making considerable progress in the management of naturally regenerating stands (1960, 1963). He had demonstrated the validity of releasing kauri from its kanuka nurse and the thinning of overstocked pole stands in order to increase growth rates. In 1960 his efforts, too, were largely curtailed just as he was getting close to setting down definite management procedures for regenerating kauri stands. Fortunately he was able to maintain surveillance of most of his work and when he returned to full-time kauri research in 1973 easily picked up the threads again.

By 1960 the work of Morrison and Lloyd, along with contributions made by the Forest Research Institute staff, Guthrie working in the Coromandel forests; and earlier efforts by men

like A. D. McKinnon (1937, 1940, 1945, 1946) had proceeded to a stage when a few more years of research would have solved most of the serious problems confronting the successful management of kauri forests.

### RESEARCH STOPS AGAIN

In the early 1960s work on kauri research was again stopped. This time there was no depression to blame and the reasons are much more obscure. As there are no references to it in either the Director General's annual reports (A.J.H.R. 1960-65) or Parliamentary debates (1960-65) it can be assumed that it was not a government directive. There were probably three reasons. First, it may have appeared to Forest Service administrators that there had been no dramatic breakthrough and that research efforts, especially in the field of artificial establishment, were not producing the quick results that Entrican obviously hoped for after his Queensland experience of 1955. Secondly, there was a realization at this time that, no matter what was done, kauri timber from regenerating or plantation stands would not be ready for use before supplies of mature timber ran out. Thirdly, and most importantly, the Forest Service had begun to realize that during the period 1980-1990 there would be a severe wood shortage unless some quick action was taken to increase the exotic forest estate (A.J.H.R. 1959, p. 40). The annual area planted by the State more than trebled between 1960 and 1965 and this undoubtedly drained away from indigenous forests the small amount of money and manpower that was being employed in that field.

### CONSERVATION, ECOLOGY, ENVIRONMENT

Pressure from conservation groups was to give the impetus to further research. In the mid 1960s words like "conservation", "ecology" and "environment" were becoming fashionable, and in the forestry field there was an upsurge of feeling over the logging of mature kauri. The conservationists' first victory came when the Manaia sanctuary near Coromandel was proclaimed in 1971, and their efforts culminated in the stopping of logging in Warawara forest in 1973. Other small sanctuaries have also been set aside.

In 1973 (A.J.H.R. p. 17) the Government announced its new kauri policy. The policy (Barton, 1974) is very similar to that previously followed but with a subtle change from timber management to management for species perpetuation, public enjoyment and timber production. Planting is to be recommenced on selected sites, and further areas of kauri regeneration acquired. Kauri research has begun again and foresters are now working full time on the work they were taken off some ten years earlier.

The logging of mature kauri has now almost ceased and an era has come to an end. Hope for the future management of kauri lies in the regenerating stands and perhaps plantation-grown kauris. Future emphasis must be in these fields.

## DISCUSSION

This paper began with a comment made in 1960 (A.J.H.R. p. 18), "No national activity in the whole history of New Zealand has received so much lip service as indigenous forestry". This statement is well supported by the evidence of the years and is still true today.

One factor which emerges from a study of government activities in the indigenous forestry field is that people have been very prone to make speculative statements which may have little basis in fact. Over the years this type of statement has built up and reinforced the prevailing attitude that not only is indigenous forest management uneconomic but it is also virtually impossible. That this could be correct is not the point! The point is that recurring statements, based on *minimal empirical evidence*, have tended to condition foresters into thinking that indigenous forest management is not worth considering, and it is now difficult to generate enthusiasm to overcome the accumulated prejudice of one hundred years.

The reason there is insufficient evidence to support policy statements on kauri management is that insufficient research has been done. During the first decade of the Forestry Department kauri studies evoked a great deal of interest. Then in 1932 the Research Station at Waipoua was closed and apart from a reasonably successful attempt to regulate the cut of kauri little more research was done for twenty years. The early 1950s saw a real attempt to solve some of the problems, but just as the people concerned were getting their teeth into the bone of kauri management the Forest Service took the bone and quietly buried it. By 1961, virtually all kauri research had ceased again and activities were not revived for ten years when work recommenced, mainly in the field of regeneration management. Successive Directors of Forestry have admitted that research into the problems of kauri management is a long-term one (e.g., A.J.H.R. 1955, p. 21) and yet they have not been able to persuade governments to maintain the impetus of research. It seems that politicians and governments, who usually have fairly short lives, cannot comprehend the very long-term nature of indigenous forest management. For example, in times of financial difficulty, it may be necessary to prune expenditure, but if this is allowed to affect long-term research projects much of the work partially completed is lost and needs to be begun again when research is resumed.

To give the Forest Service its due, it has never wavered from one central principle, that the management of mature

kauri forests is essential to their survival. Based on existing evidence this principle appears to be ecologically sound: kauri forests probably do not perpetuate themselves, for very little regeneration is ever found beneath mature forests. Unfortunately, we have no evidence to prove that management with some form of selective logging system will ensure their perpetuation. If research into this problem had been begun in 1919 and had kept going, answers would by now be appearing; foresters would have definite management principles to work to and it is less likely that the Forest Service would be fighting a rearguard action with conservation groups.

The major reason advanced for not practising kauri management on a larger scale is that it is not an economic proposition! There is no doubt that, based on any level of compound interest, an investor is going to prefer *P. radiata* to kauri. But the problem is not that simple and Government has an obligation to study other aspects of the question. In 1940 (A.J.H.R. p. 11) a brief comment was made on this aspect when the Director of Forests proposed that, instead of devoting the income from kauri royalties to establishing exotic forests elsewhere, the Government should return a much higher proportion to the forest from which it originated, in order to improve management there. As far as kauri was concerned this touched the nub of the problem. A large part of the initial prosperity of the Auckland Province was based on kauri and many of our early exotic forests were no doubt established, in part, on the proceeds of kauri timber sales. For instance, in the five years following the establishment of the Forest Service in 1919, sales of kauri timber realized approximately \$350 000, about 10% of the total receipts from timber sales. On the available evidence it seems that little of this found its way back into kauri management.

### A PROPOSAL FOR THE FUTURE

Following the 1940 proposal it is not unreasonable to argue that a small part of the profits from pine forestry should now be ploughed back into kauri management. This may not be a good financial investment but other factors, such as history, tradition and aesthetic values, should also be taken into account. If the French, not usually sentimental over financial matters, are prepared to grow oak on a 240-year rotation (Evans, 1973), then surely New Zealanders can consider a similar proposition for kauri.

If kauri is to be perpetuated and managed for reasons additional to pure economic gain, then all aspects should be clearly spelt out in the Government's "New Kauri Policy". At present this document consists very largely of general pronouncements, and to be effective it needs to be more specific, especially in the following fields:



- (1) By a clear definition of those areas which are to be set aside as sanctuaries, and those which are to be managed.
- (2) By initiating legislation prohibiting the felling of privately-owned regenerating kauri, until the Forest Service has been offered the land and trees for purchase.
- (3) By making a definite and continuing financial commitment to the acquisition of kauri regeneration in private hands and to financing research and management projects.
- (4) By identifying and describing research fields and providing for their co-ordination both within and without the Forest Service.
- (5) By stepping up research into artificial establishment procedures and making available suitable areas of land for the artificial establishment of kauri. At the same time the potential of other species of *Agathis* and *Araucaria* should be evaluated.
- (6) By specifying the amount of the allowable annual cut.
- (7) By formulating a preliminary management procedure and testing it in management-sized trials.

Kauri is an important tree to New Zealanders, not only for its superb timber but also because of its historical and traditional values. It needs to be protected or managed so as to satisfy the varying desires of the people of this country. Money spent will not be a good investment by normal economic standards, but if the value of people's wellbeing is taken into account then the investment becomes well worth while.

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*Footnote:* Annual reports to Parliament which deal all or in part with forestry matters were written prior to 1919 by the Secretary or Under-secretary of Crown Lands. In 1919 and 1920 the report was written by the Secretary of the Forestry Department. From 1921 they were written by the Director of Forests and from 1960 by the Director-General of Forests. All of these reports are referred to as *Appendices to the Journal of the House of Representatives*.