INTRODUCTION

The late history of Northland can be divided roughly into three periods, each of fifty years. In the first a potentially valuable resource, the kauri forests, was wasted. The replacement resource, pastoral farming, which it was hoped would be of greater value proved a chimera. In the third, steps were begun to at least partially restore the original in association with high technology farming. Policies right for the country overall may easily fail at the local level. In Northland this was particularly the case because, not only were the soils poor, but the kauri forest was a resource almost without parallel in the world. Sustained yield forest management, a tried and true technique in other countries, would by hindsight have been a much better option.

Sound policies are simply difficult to implement; incompetence was no more common then than now, yet a disaster occurred in this case. The “Think Big” policies of the day overrode the physical limitations of the region. There was over-capitalisation by sawmills who, in the subsequent search for the profits needed to survive in a competitive commercial environment, over-produced while demanding and obtaining cheap wood from the government. They ended up in a vicious circle which destroyed them in the end as well as the magnificent kauri resource. It would have been far better if the resource had been valued at a realistic level in the first place to ensure its husbanding and effective utilisation. The policy which would have justified this wastage, the creation of a prosperous agriculture on the land, foundered on the poverty of the soil.

Since 1903, in a small way at first but at an increasing rate in recent years, another forestry resource has been in the making. This new resource is only a patch on the kauri one of old but it should make a very substantial contribution to the region’s economy and that of the nation. However, we also have in Northland the seeds of its destruction for exactly the same reason that the kauri resource was destroyed — that is, over-capitalisation of the wood-using industry through the policies of central government.

*N.Z. Forest Products Ltd., Tokoroa.
and lending institutions. Hopefully, this time around, destructive tendencies will be corrected in good time.

PRE-EUROPEAN FOREST HISTORY

Pre-Maori Colonisation

Kauri forest dominated the landscape of Northland for aeons before man ever colonised New Zealand. It has been estimated that approximately 1,000,000 hectares of land was covered with forest containing a kauri element. Although the kauri component was not dominant throughout, there were some areas where it was the only tree species in the forest canopy. Recorded history deals mainly with kauri; other species were of minor importance.

Outside the gate of the Sweetwater Nursery there is a kauri log, rescued from a nearby swamp, which has been carbon dated at 31,000 years old. Until the appearance of man, these magnificent forests had reigned supreme, being subject only to the whims of nature.

Maori Civilisation

The Maori was particularly aware of his dependence on the forest and made great efforts to conserve it. To quote Elsdon Best:

"Assuredly the Maori prized the forest and his aim was to conserve it; as a rule any clearing made for the purpose of cultivating crops was not situated in the heavy bush but brush areas or light bush as is seen on the skirts of a forest". In Northland the presence of volcanic cones made useful gaps in the heavy forest cover and these were extensively used for pa sites. Timber was certainly highly prized by the Maori and he used it extensively in his life style for buildings, fortifications, canoes, and so on. The kauri was not the most prized tree of the Maori: the totara was, because it was easier to work. Others, such as miro, were valuable for the food they made available. It was, however, used for some purposes.

(1) The Maori tattooist used it in his craft — dipping his chisel into a preparation made from burnt and powdered resin, a pigment used to produce the "fast" blue black colouring of the moko. The gum was burned under sheets of green bark to produce this lamp-black.

(2) As the fuel in torches for fishermen.

(3) For chewing, the gum was boiled in water until plastic, then the juice of thistles (puwha) added to make it soft and pliable.
THE ARRIVAL OF THE EUROPEANS

Kauri Masts and Spars

The arrival of Europeans in New Zealand is recorded in May 1772 when Marion du Fresne called into the Bay of Islands to repair damage to foremasts and bowsprits. Kauri trees were felled on 29 May 1772, shaped and transported laboriously to the water with the help of some Maoris. The expedition ended in tragedy with du Fresne and 25 others being killed by other Maoris. (Perhaps they had an inkling of events to come.)

Between 1772 and 1835 the volume of timber removed through the mast and spar trade increased in volume and then declined. The harbour areas of Whangaroa, Bay of Islands, Hokianga and Kaipara were extensively used, with trees being felled selectively close to the water. Traders came from around the world to obtain these products.

The trade declined in the 1840s when the settlers began to arrive and demands on the forests changed from masts and spars to building timbers. With the settlers came the policies of the now independent governments that the "bush" had to be cleared quickly to make way for pastoral farming.

Sale of Forest Land by the Maoris

Pressure from arriving settlers saw the sale of large areas of forested land for what we would describe today as nominal sums. Generally the timber, even if high quality kauri forest, was not valued at all for the purpose of the sale. The sale of approximately 2900 ha of forest (now largely the Puketi State Forest) in 1859 for $840 was a case in point. A Royal Commission sat in 1948 and decided that a fair bargain had been struck at the time. Prices for land at those times were in the range of $0.15 and $0.30 per hectare.

Exploitation

The increase in population after 1840, together with increased demand for export timber, intensified the cutting of kauri. An era of forest exploitation began. It could be argued that a hard necessity dictated this policy initially but as the years passed the rate of depletion of the forests became greatly accelerated. It is difficult to find words that aptly describe the waste of what was an extremely valuable resource over the period between 1840 and 1910. There was more burnt to waste than was ever converted to usable products.
The land settlement policies saw settlers clearing and burning valuable timber to fulfil their contractual obligations while timber was being imported because the sawmills could not satisfy demand at times. Very large sums of valuable foreign exchange were expended on these imports.

The exploitation era coincided with a period of political instability in New Zealand with a succession of 27 governments in 37 years from Bell-Sewell (1868) to Seddon (1906). Despite the advice of forest authorities of the day, such as F. von Hochstetter, Campbell Walker, and numerous Commissioners of Crown Land, a deaf ear and a blind eye were turned by the governments of the day. Even Seddon, who called a timber conference in 1896 wanted only a cessation of the waste from clearing and burning rather than a policy of sustained yield forestry.

During the 1860s large steam-powered sawmills were built which had the ability to utilise vast quantities of kauri. In 1870 there were 11 mills in the Auckland Province capable of producing 80,000 m$^3$ sawn (33.8 million ft) per annum. By 1881 this had risen to 40 mills producing 260,000 m$^3$ sawn (110 million ft) per annum. Mills were grossly over-capitalised and there was gross over-production with the inevitable consequence that prices were normally so low that no lasting profits were made. In 1890, for instance, kauri timber sold in Melbourne left no margin for profit.\(^3\)

In 1905 a report was published titled “Timber Industry of New Zealand”. It contains extracts from reports by Commissioners of Crown Lands giving statistical details of sawmills operating in Northland and North Auckland. This showed there was a daily cutting capacity of 1,735 m$^3$ (sawn) and 426,509 m$^3$ (sawn) per annum (240 days per year). During 1904 the reported output from these mills was 308,375 m$^3$ (sawn) of which most was kauri — a capacity 38% greater than required. These figures can be compared with those in Table 5 showing current sawmilling capacity.

[Note: The dividing of board foot (sawn) figures quoted in the literature by 424 gives m$^3$ (sawn).]

By 1906 the peak of kauri production was reached and the beginning of a fairly rapid decline of the kauri industry. The largest mills were closing or closed and the once vast kauri forests no longer existed, having been devastated by fire and logging.

These forests produced valuable foreign exchange which helped in the development of other parts of the country but left Northland with a legacy of poor soils, unsuitable in large part for agriculture, and a poor infrastructure. How much more could have been
done for the economy with controlled cutting and sensible manage-
ment is a matter for idle speculation today.

It could be argued that the basic problem for the forests of New
Zealand was that the country was settled by the British — who, in
their own country had long had poor stop/go forest policies. As a
result of the British “no State Forest” policy applied to New
Zealand, nine-tenths of the kauri forest were destroyed rather
than worked and preserved for the Dominion. It may have been to
the advantage of the forests if some continental power that had
had a long tradition of State forestry had colonised New Zealand.

The quality and extent of the kauri forests were such that
“normal” forestry on the German pattern would have been
perfectly conceivable. The lack of an adequate policy has meant
the loss of what were the finest softwood forests in the world and
with them the loss of an export trade predicted in 1919 to be
worth more in the long term than either wool or dairy produce.5

“The then national forest policy of ‘laissez-faire’ was to blame”.6

D. Hutchins6 quotes the following: “Not many years ago a
prominent New Zealand politician addressed an important London
audience on ‘New Zealand and its Products’. He mentioned
products that some New Zealanders have never heard of, but he
clean forgot the Kauri, the forests and all they were producing
although at the time they were supporting more hands than any
other industry.”

The Department of Lands Report (1909) on Forestry in New
Zealand6 contains the following paragraph:

“The greater part of the District (north of Auckland) has been
covered with dense forests, which are now fast disappearing under
the axe of the settler, and being transformed into rich pasture
land. The only really good Crown lands fit for settlement in
the North are still all covered with forest, and must be cleared
and sown before any returns can follow”.

That quote epitomises the attitude of the early settlers who,
having come from a pastoral background, saw the forests only
as an obstacle to the development of grassland.

The Puhipuhi Fires

The Puhipuhi Forest was conservatively estimated at 7000 ha
in extent. It had been bought from the Maoris with the intent
of managing it for a forest reserve. It would not have been a
difficult matter technically to manage this forest on a sustained
yield basis. This is unlikely to be what the authorities had in
mind at the time even though the techniques had been in practice on the Continent for many years and had proved very profitable financially and in terms of rural employment. However, this valuable forest, with its majestic trees, slipped quietly out of sight because there was no forest demarcation to separate it from the “bush” required to be cleared for settlement and because there was no Forest Department to take it in charge.5

The first fire occurred in 1881 but the most serious was in 1887. A. H. Reed, the publisher, who was brought up in Whangarei, noted: “The night sky glowed red week after week as the fire ate its way through the great forest.”4

Gumdiggers and sawmillers were variously attributed with maliciously starting the fire, because it was a reserve presumably, but nobody really knows. It was impossible to extinguish the fire so nature took its course. The area contained 2300 ha of extremely well stocked forest, “the clean taperless stems like a string of candles set side by side”.5 The remainder was a mixture with totara and other species.

Hutchins estimated the standing volume of the pure area alone at 1 600 000 m³ (697 m³/ha) and attributed to it a royalty value of $5.11 million in 1919 prices. He further estimated the loss of future crops, using a capitalised rate of 4%, at $3.06 million.

The annual increment of kauri attributed to the area was some 48 000 m³ (7 m³/ha/yr). This is a growth rate better than many northern hemisphere coniferous forests — not as good as radiata pine in New Zealand today, certainly, but unquestionably a more valuable timber.

The use of present-day royalties for mature kauri timber graphically illustrates the value of the standing crop lost in the fire alone:

(1) NZFS 1980 sales @ $183/m³ (value equivalent, $293 million)
(2) Private sales, Waitemata District 1983 $400/m³ (value equivalent, $640 million) (J. Halkett, pers.com.)

It is of interest to compare the forest assets of N.Z. Forest Products Ltd. with this Puhipuhi Forest. They were reported at $134 million in the annual accounts for the year ended March 1982.

Hutchins5 quotes on p. 63 that only 140 000 m³ (sawn) of kauri timber was recovered from the forest after the fire. The standing volume given earlier of 1 600 000 m³ (round), even assuming a 25% loss in sawing, shows that a realisable resource of 1 200 000 m³ (sawn) was initially present. Only 12% of the potential sawn volume was therefore recovered.
One of Hutchins' last paragraphs on the subject is ironic, particularly in the light of the current farming vs forestry discussions, namely: “Locally, when the rich forest was turned into a fern waste, or at best a poor grazing area on impoverished soil, the countryside lost half its industry and population, together with those amenities to country life which go with a larger population — better roads, better shops, and better postal facilities and social intercourse.”

**Kauri Gum**

Between 1853 and 1914 over 3.3 million tons of kauri gum brought in revenue amounting to $34.4 million (average of $100 per ton). Its contribution to exports from New Zealand was second only to gold in terms of minerals. There were many different grades, some being almost valueless, with the finest earning up to $600/ton at the time.

As well as digging for gum by hand, an occupation of many thousands of people, the practice of bleeding kauri trees became widespread. Foresters of the day, including Hutchins (1919) and Hohneck (1930s) among others, argued that, if properly controlled, it could be carried out without detriment to the trees. This, of course, was never possible.

Before the turn of the century “bled gum” had no value. About 1909, on an ill-starred day, the government sanctioned “gum bleeding”, giving one Dysart the right to bleed 300, and he bled 3000 trees. A lawsuit followed, but the bad practice of unregulated “gum bleeding” was started and continued for many years. The legacy of rotten, scarred trees throughout Northland is the present-day result. The financial returns from this practice were pitifully small.

**Gumlands**

Much of the land cleared by the fires and sawmillers was totally unsuited to farming (even today's high technology farming finds it difficult and expensive). The 1898 Kauri Gum Commission estimated these “gumlands” to have an area of 293,000 ha and were so poor they recommended their being sown with gorse; with what end use is a matter of conjecture. These lands have remained more or less idle until the present day. The kauri tree’s penchant for podzolisation of its own soil surrounds contained the seeds of its own destruction as well as an unfortunate economic legacy.
INTRODUCTION OF FOREST MANAGEMENT

Sale of the Remaining Areas

At the same time that Hutchins' book was published in 1919, the government was still busy with its plans to "clear the bush" and settle people on farms. In that year tenders were called world wide for the sale of all timber and the clearing of land on what is now Omahuta S.F., Puketi S.F., Waipoua Sanctuary and Warawara S.F. These areas were the, at best, poor cousin remnants of the original forest. While the sale was kept open for two years there were no bids received. The only area cleared was the Omahuta Valley and this was carried out by people who had left Murchison after the earthquake.

When the Forest Service was formed in 1919 these areas became Provisional State Forest which meant that they could still be cleared for farming if there were any takers but it would be overseen more carefully by Forest Service staff. An early example of this care was that R. D. Campbell in about 1920 visited the steam hauler gangs at Omahuta and stopped them from using kauri of less than 60 cm dbhob as boiler fuel (A. N. Sexton, pers. comm.). They sent logs larger than that to the sawmills even in those days.

Kauri Research — Waipoua

During the 1920s a research station, under the leadership of Arnold Hansson, was established at Waipoua to investigate various aspects of kauri management. These included:

1. The use of kauri waste for the production of distilled tar?
2. Production of kauri seedlings for outplanting in unstocked or low stocked areas of Waipoua.

Despite Hansson's cleverness, he was difficult to deal with socially, having a penchant for the ways of Henry Ford. Problems first arose in 1926-7 and led eventually to the closing of the station in 1933. Today, little evidence of value exists in written or observable field work of the work of this research station.

Waipoua Controversy

Northland's forests saw another first, toward the end of and after World War 2 with the campaign to have the Waipoua forest
declared a sanctuary and be locked up in perpetuity. This campaign was eventually won by the “environmentalists” of the day but not until a long and bitter struggle had ensued.

Before the establishment of the State Forest Service in 1919, Waipoua was a “national park” with low stockings of kauri overall and, where trees did exist, often crowded, hollow and rotten. Silviculture during the ’20s and ’30s helped turn parts of Waipoua into useful high forest.

The campaign was led by one W. R. McGregor, Professor of Zoology at Auckland University, whose emotional appeals and superior rhetoric won the day. The pity of it was that he had originally believed that technical forest management was feasible. He defended the Forest Service in a magazine called *New Zealand Life*, the edition of 1 Oct 1926.

The State Forest Service wanted a proposed road to go around the forest but was overruled by, among others, the Prime Minister, G. Coates, who stated the opinion “that the forest must have depreciated by 25% by now”. McGregor commented at the time that, “far from being in a state of decay, the Waipoua Forest is in a surprisingly healthy and virile condition . . . and with but little trouble could easily be converted into a valuable permanent source of revenue”. This remarkable about-face is rumoured to have had its beginnings in a dispute with the NZFS bureaucracy of the day over a few pounds’ expenses.

The magazine article has a further paragraph, namely: “The Public Works Department state that a road through the forest would be “superior” to a road around it. . . . Surely the permanent welfare of a great kauri forest is of chief consideration And who is to be final arbiter in Forestry questions — Foresters or Politicians?”

Hohneck’s letters, Moore’s Report and Roseberg’s paper typify the feelings of the day on both sides with, as usual, more heat than light but with enough emotion to sway the people and the politicians to declare some 12 000 ha of Waipoua a Sanctuary in 1951. Roseberg’s final paragraph states: “Practical common sense and the foresters have had their show and have demonstrated their abilities on millions of acres of kauri that formerly clothed northern New Zealand. Perhaps now it might be well for the New Zealanders to give their emotions a chance.”

McGregor maintained his interest in the Waipoua Sanctuary throughout his life, being a member of the Committee and springing to the defence when he thought its integrity was threatened.
MATURE KAURI SALES OF RECENT TIMES

The last major sale of mature kauri timber involving clear-felling took place in Warawara S.F. between 1968 and 1973. The original impetus for this sale is rumoured to have come from one Father Wanders and was designed to assist in the keeping open of a temporary high school at Pangaru, presumably through the allocation of fifths and tenths. The Forest Service did not wish to see the sale go ahead, but were overruled by the Minister who demanded it be tendered. Only Whitecliffs Sawmilling Co. Ltd tendered and they obtained the sale at the royalty of $14.13/m$^3$ (round) (see Table 1). Roading and logging were very expensive because of the isolation and poor ground conditions so the royalty was reduced in June 1970 to $8.83/m^3$ (round). By 1973 the public pressure was so great the sale was cancelled and exotic supplies ex Kaingaroa and Omahuta S.F.s were substituted for the volumes withdrawn.

Until the discovery of kokako in 1979, mature kauri removal on a selection logging basis was practised at Puketi S.F. The level of removal was on a sustained yield basis of 850 m$^3$ per annum. The latest reported royalties received in 1980 for mature high quality logs with a diameter greater than 1 m from this source were approximately $183/m^3$.

Table 1 sets out an historical record of royalties paid for kauri between 1875, when records were first kept, and the present day.

KAURI TODAY

In Northland today there are some 10 239 ha of so-called kauri resource administered by the Forest Service. This is made up of 5 730 ha of mature and 4 509 ha of second-crop kauri (1 523 ha dense and 2 986 ha scattered). This is a little under half of the total NZFS estate of 21 984 ha. Non-Forest Service interests hold some 54 222 ha of which 434 ha are mature and reserved. The remainder is second crop (53 788 ha). There are 14 603 ha of dense and 39 185 ha of scattered kauri bearing forest.\textsuperscript{12}

Management on State areas includes planting, silvicultural tending, production thinning by helicopter, and in general maintaining and/or increasing the quality and quantity of the estate. In private areas, other than reserves, more traditional practices occur, but generally owners tend to be emotional and conservative over their estates.
### TABLE 1: RECORDED KAURI STUMPAGES OVER THE YEARS

<table>
<thead>
<tr>
<th>Year</th>
<th>Royalties per 100 super ft log measure ($)</th>
<th>$ Royalty $/m³ average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average</td>
<td>Range</td>
</tr>
<tr>
<td>1875</td>
<td>0.02</td>
<td>0.02 - 0.02</td>
</tr>
<tr>
<td>1884</td>
<td>0.04</td>
<td>0.04 - 0.04</td>
</tr>
<tr>
<td>1895</td>
<td>0.07</td>
<td>0.04 - 0.10</td>
</tr>
<tr>
<td>1905</td>
<td>0.10</td>
<td>0.07 - 0.15</td>
</tr>
<tr>
<td>1915</td>
<td>0.30</td>
<td>0.10 - 0.50</td>
</tr>
<tr>
<td>1925</td>
<td>0.80</td>
<td>0.74 - 0.85</td>
</tr>
<tr>
<td>1935</td>
<td>0.90</td>
<td>0.85 - 1.00</td>
</tr>
<tr>
<td>1945</td>
<td>1.60</td>
<td>1.50 - 1.75</td>
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<tr>
<td>1955</td>
<td>4.70</td>
<td>4.19 - 5.30</td>
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<tr>
<td>1968*</td>
<td>—</td>
<td>—</td>
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<tr>
<td>1971*</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1980</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1983†</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1983 (poles)‡</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

**Notes:**
(a) 100 super ft log measure = 0.3 m³ round
(b) Prices all stated in dollar terms of the day — 
i.e., 1875 was 2 pence converted to 2c or $0.02.
(c) Figures obtained from a memo signed by R. D. Campbell and dated 1964.
(d) All figures post-1964 from NZFS records unless otherwise stated.
(e) Royalties for second-crop “pole kauri” today are less than for mature trees but still substantial:
1. NZFS 1981 — poles from 90-year-old thinnings. Royalties 70 cm dbh trees $105.74/m³ at roadside 70 cm dbh trees $120.74/m³.
2. NZFS 1983 — add $40/m³ (J. Halkett, pers. comm.).

*Prices for log sale ex Warawara S.F.
‡Prices for mature wood unless otherwise stated
†Limited private sales ex Waitemata area (J. Halkett, pers. comm.)

The total volume of utilisable resource in S.F. is some 800 000 m³. The NZFS Kauri Management Unit is of the opinion, based on resource data collected, that an annual sustained yield from kauri forest in the long term is somewhere in the region of 12 500 m³ per annum.

### EXOTIC FORESTRY

**Beginnings**

Even before the cloak had been drawn over the destruction of the kauri forest, forestry officials began to establish man-made plantations.
On what is described as the worst of the soil at Puhipuhi (485 ha) unsuccessful attempts were made to establish plantations of native and introduced trees. Totaras and eucalypts were planted in 1903 but these mainly failed, apparently owing to inexperience and the choice of unsuitable species for the conditions. There was general concern within the Forest Service for future timber supplies and this led to the establishment of small plantations mainly for local supplies.

The settlers soon discovered that the soils of Northland were not suitable for agriculture in many instances and considerable areas reverted to fern and scrub. These areas were slowly acquired by the Forest Service and more particularly the Lands Department and development for forestry and agriculture on a more regular basis began. Plantations were started at Waipoua, and Waitangi in the late 1920s-early 1930s with a range of pine species, but on a fairly small scale.

**Soils and Species**

The early plantations mostly made very poor growth because of the phosphate-deficient soils — the legacy of the kauri’s podzolisation ability. This led to the virtual abandonment of *Pinus radiata* as the main species and a concentration on the southern pines *i.e.*, *P. elliottii*, *P. taeda*, *P. palustris* and others such as *P. pinaster*. The thought of using fertiliser did not eventuate until after World War 2.

Despite the fact that very large areas were idle or reverting and low priced, these problems led to a policy decision by the Forest Service that acquisition of land and forest planting were of the lowest priority in Northland in relation to the rest of the country. This policy remained in force right up to the 1960s, a fact which is reflected in the lack of mature forest in Northland today. (The concentration on the planting of the fertile pumice lands in the Central North Island was, however, a very rational decision and the profitable forest industry of today reflects its correctness.)

**Stoney Creek**

The most important plantation project proposed during the 1930s was to be at Stoney Creek, north of Kaeo. Some 8 000 to 12 000 ha of scrub country were demarcated and experimental plantings made. The plant and machinery required to begin the project had arrived at Waipoua District Office when World War 2
started. The project was cancelled. At the end of the war when
the soldiers returned, the land was resumed for land settlement.
Today, the area is largely a Lands and Survey Development block
still awaiting settlement.

**Post-World War 2**

After the war's end some of the poorest, steepest, most difficult
country remained as provisional State Forest — e.g., Maungatapere
S.F. and Rakautao S.F. Areas such as that known now as Glen­
bervie S.F. and various other pieces adjacent to existing State
Forest were slowly acquired as farmers quit their losing battle
with soil fertility and weed problems (particularly gorse). Many
of the areas offered to the Forest Service for plantation establish­
ment were turned down because of the priority policy decision and
NZFS files are liberally sprinkled with land offers refused because
prices asked were considerably higher than government valuation
(e.g., $0.25/ha asked when the value was assessed at $0.12/ha.)
Glenbervie S.F. was started toward the end of the war and today
this forest provides a large proportion of the mature timber
supplies of the region.

**Commercial Forestry**

Shortly after World War 2 the first plantings of private exotic
forests took place at Kaihu and Mamaranui near Dargaville.
The other major areas planted were at Topuni and Tinopai south
of the Brynderwyn Range. Both these areas were started by
individuals but they were eventually bought out by Henderson and
Pollard Ltd. Private exotic forestry did not establish any large
areas, however, because of the soil and climate problems.

**Aupouri S.F.**

The sand dunes behind the Ninety Mile Beach had been
shifting freely since the early part of this century. The Public
Works Department planted *P. radiata* and *P. pinaster* on some
160 ha near Waipapakauri during the 1940s. Though these areas
were not maintained properly, they did demonstrate the ability
of trees to hold the dunes and once properly established grew
at an economic rate.

In the early 1960s when radiata pine and forestry in general
were beginning to prove their value to the economy and people
of New Zealand, a new project was begun to establish a 25,000
ha forest on these dunes. Initially it was to be established in 30
years with a planting rate of approximately 800 ha per annum.
The money required to finance the project was not forthcoming so, for what could be said to be the first time in Northland, political pressure in favour of forestry was applied through the Auckland Weekly News and television. The district had all the right elements: serious sand erosion threatening established farms; very high unemployment, particularly among the local Aupouri Maori tribe, and a low level of prosperity in general. Even the timing was right with national elections in the offing.

The Forest Service concentrated all its efforts on this project and areas being planted today by private interests were bypassed. It can be argued that this forest has serious location problems today in terms of transport to ports but the then proposals for development and utilisation were thought to make engineering and economic sense. They certainly made political sense.

The utilisation plans of the day are interesting in the light of intervening events. A pulpmill was to be built on the Karikari Peninsula, with a port at Matai Bay. The Rangaunu Harbour was to be dammed and dredged out, with the tailings going to fill the Kaimaumau Swamp. The harbour was then to fill with fresh water. Timber would have gone by rail from Aupouri, across the sandstone ridges in the swamp, over the dam and thence to the mill.

The political pressure was sufficient to have the planting rate boosted to 1200 ha per annum in steps and this has been maintained since. Only one major reduction in planting rate was ever contemplated and this caused the establishment of the 58 ha “Community Forest” planted by the people of Kaitaia and the reinstatement of the programme.

Forestry Expansion

Since the early 1960s exotic forest planting has boomed in Northland with larger and larger areas being planted each year. This has been due to:

(1) Advances in technical forest management relating to cultivation and fertilising of very poor sites.
(2) Policies of regional development by successive governments.
(3) The availability of cheap land and a ready labour supply.
(4) Rising confidence in exotic forestry in general.
(5) The large Aupouri resource.
(6) The arrival of large private companies on the Northland forestry scene.
PRESENT RESOURCES

Planted Areas

Figure 1 gives the age class distribution of radiata pine (alone) in the seven northern counties as at March 1983. These areas have been obtained from the N.Z.F.S. stand records, the PRIFO system, and the records of the larger forestry companies operating in Northland. The total area at this stage is approximately 66,930 ha. If the areas of exotic trees other than radiata pine are added this increases to 71,615 ha.

![Graph showing planted area data for Northland as at 31.3.83 (radiata pine only).](image)

The 1982 planting figures are still provisional. These statistics are normally presented in five-year lustra but are here given annually (as accurately as possible) to better illustrate the increase in plantings since 1961. New planting by the State has remained relatively constant at 2,000 ha per annum over the past 10 years. The figures show the increasing importance of the private sector. The lack of mature forest shown is reflected in the static supply of sawlogs until after 1990 (Table 6).

The 1978 Northland Regional Resource Survey (NRRS)\textsuperscript{15} contains a prediction of future plantings for the region which shows the rate increasing with time. Those given for the Northern,
TABLE 2: COMPARISON OF NRRS, NFDS PREDICTIONS WITH ACTUAL
(Figures in ha)

<table>
<thead>
<tr>
<th>Year</th>
<th>NRRS Study*</th>
<th>NFDS*</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>1976</td>
<td>4547</td>
<td></td>
<td>5219</td>
</tr>
<tr>
<td>77</td>
<td>4547</td>
<td></td>
<td>5608</td>
</tr>
<tr>
<td>78</td>
<td>4547</td>
<td></td>
<td>5436</td>
</tr>
<tr>
<td>79</td>
<td>4547</td>
<td></td>
<td>5517</td>
</tr>
<tr>
<td>80</td>
<td>4547</td>
<td></td>
<td>4585</td>
</tr>
<tr>
<td>81</td>
<td>6491</td>
<td>7053</td>
<td>7020</td>
</tr>
<tr>
<td>82</td>
<td>6491</td>
<td>7053</td>
<td>8573</td>
</tr>
</tbody>
</table>

*Original data in five-year lustra only. 98% of plantings are with radiata pine.

Eastern and Western sub-regions are compared in Table 2 with the actual plantings there since that time. Studies such as the Forestry Industry Study (1980)\textsuperscript{16} and the Northland Forestry Port Study (1980)\textsuperscript{17} did not publish the planting predictions but these are known to be based on those given in the NRRS. The unpublished Northland Forestry Development Study (NFDS) (1980)\textsuperscript{18} predictions are also shown.

The table gives a graphic display of the way predictions considered very optimistic at the time have been exceeded.

**Future Plantings**

The studies also gave predictions of planting rates beyond today as well. These are given in Table 3.

TABLE 3: FUTURE PLANTINGS IN NORTHLAND
(Annual areas in ha)

<table>
<thead>
<tr>
<th>Years</th>
<th>NRRS</th>
<th>NFDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981-85</td>
<td>6,491</td>
<td>7,053</td>
</tr>
<tr>
<td>1986-90</td>
<td>8,310</td>
<td>7,650</td>
</tr>
<tr>
<td>1991-95</td>
<td>10,129</td>
<td>6,086</td>
</tr>
<tr>
<td>1996-00</td>
<td>230</td>
<td>5,570</td>
</tr>
<tr>
<td>2000-05</td>
<td>—</td>
<td>2,370</td>
</tr>
</tbody>
</table>

The rates of plantings vary in these studies but the eventual planted area does not differ markedly being 172,971 ha for the NRRS and 157,000 ha for the NFDS. The fact that there is already a planted estate of approximately 66,930 ha and there are published plans to increase this by at least 60,000 ha give every indication that these figures will be achieved. Factors such as land prices, availability, profitability of farming, and land use restrictions will, of course, have an important influence.
Land Resources

In the 1978 NRRS, 334,000 ha of the region were identified as suitable for exotic afforestation. It was then assumed that only 200,400 ha would be likely to be available. This figure was used up until the 1981 Forestry Development Conference when a re-evaluation was carried out and a figure of 203,000 ha derived as suitable. This was broken down as shown in Table 4.

<table>
<thead>
<tr>
<th>County</th>
<th>Area (ha)</th>
<th>County</th>
<th>Area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mangonui</td>
<td>40,200</td>
<td>Whangarei</td>
<td>41,300</td>
</tr>
<tr>
<td>Hokianga</td>
<td>28,100</td>
<td>Hobson</td>
<td>27,000</td>
</tr>
<tr>
<td>Whangaroa</td>
<td>20,500</td>
<td>Otamatea</td>
<td>8,700</td>
</tr>
<tr>
<td>Bay of Islands</td>
<td>37,200</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>203,000</td>
</tr>
</tbody>
</table>

It is predicted in the various studies that the availability of suitable land should not be limiting in achieving an exotic forest estate of 100,000 ha in Northland. This figure was shown as a regional target at the 1981 Forestry Development Conference. It is apparent from the previous discussion that this figure will be achieved and likely exceeded.

Sawmill Capacity

The sawmill capacity in m$^3$ (sawn) for Northland’s sawmills is given in Table 5 for the years ended 31 March 1979 and 31 March 1982. There are some items of interest to be found in this table.

1. Reported sawmill capacity has increased significantly between the two years both in the seven northern counties and in the Rodney County, Waitemata City area.

2. In the seven northern counties this capacity increase has been from 89,760 m$^3$ (s) to 119,040 m$^3$ (s) (29,280 m$^3$ (s) or 33%).

3. In the southern area the increase has not been so dramatic but is significant all the same — i.e., from 74,640 m$^3$ (s) to 89,760 m$^3$ (s) (15,120 m$^3$ (s) or 20%). These increases in capacity have been funded mainly by domestic lending institutions in the face of a static supply of sawlogs from the region at the time, and for the next five years.

4. Reported sawmill capacity at 31 March 1979 was 186% greater than the sawn output for the seven northern counties.
### TABLE 5: SAWMILLING STATISTICS NORTHLAND-NORTH AUCKLAND (BY COUNTY)

(All figures in m$^3$ sawn. Dates as at 31 March)

<table>
<thead>
<tr>
<th>County</th>
<th>Date</th>
<th>Sawmill Capacity</th>
<th>Indigenous Cut</th>
<th>Exotic Cut</th>
<th>Total Cut</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>per day</td>
<td>per yr</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mangonui</td>
<td>1979</td>
<td>48</td>
<td>11 520</td>
<td>852</td>
<td>3 666</td>
</tr>
<tr>
<td></td>
<td>1982</td>
<td>85</td>
<td>20 400</td>
<td>295</td>
<td>5 533</td>
</tr>
<tr>
<td>Whangaroa</td>
<td>1979</td>
<td>36</td>
<td>8 640</td>
<td>682</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>1982</td>
<td>16</td>
<td>3 840</td>
<td>984</td>
<td>69</td>
</tr>
<tr>
<td>Bay of Islands</td>
<td>1979</td>
<td>41</td>
<td>9 840</td>
<td>272</td>
<td>7 637</td>
</tr>
<tr>
<td></td>
<td>1982</td>
<td>71</td>
<td>17 040</td>
<td>418</td>
<td>5 833</td>
</tr>
<tr>
<td>Hokkianga</td>
<td>1979</td>
<td>27</td>
<td>6 480</td>
<td>252</td>
<td>2 497</td>
</tr>
<tr>
<td></td>
<td>1982</td>
<td>15</td>
<td>3 600</td>
<td>366</td>
<td>378</td>
</tr>
<tr>
<td>Hobson</td>
<td>1979</td>
<td>75</td>
<td>18 000</td>
<td>563</td>
<td>7 181</td>
</tr>
<tr>
<td></td>
<td>1982</td>
<td>98</td>
<td>23 520</td>
<td>241</td>
<td>12 379</td>
</tr>
<tr>
<td>Whangarei</td>
<td>1979</td>
<td>117</td>
<td>28 080</td>
<td>1 645</td>
<td>21 840</td>
</tr>
<tr>
<td></td>
<td>1982</td>
<td>159</td>
<td>38 160</td>
<td>1 828</td>
<td>18 852</td>
</tr>
<tr>
<td>Otamatea</td>
<td>1979</td>
<td>30</td>
<td>7 200</td>
<td>62</td>
<td>1 387</td>
</tr>
<tr>
<td></td>
<td>1982</td>
<td>52</td>
<td>12 480</td>
<td>51</td>
<td>1 965</td>
</tr>
<tr>
<td>Total 7</td>
<td>1979</td>
<td>374</td>
<td>89 760</td>
<td>4 328</td>
<td>43 917</td>
</tr>
<tr>
<td>Total Northern</td>
<td>1982</td>
<td>496</td>
<td>119 040</td>
<td>4 184</td>
<td>45 888</td>
</tr>
<tr>
<td>Rodney</td>
<td>1979</td>
<td>259</td>
<td>62 160</td>
<td>535</td>
<td>36 515</td>
</tr>
<tr>
<td></td>
<td>1982</td>
<td>210</td>
<td>50 400</td>
<td>594</td>
<td>39 725</td>
</tr>
<tr>
<td>Waitemata</td>
<td>1979</td>
<td>52</td>
<td>12 480</td>
<td>120</td>
<td>8 185</td>
</tr>
<tr>
<td></td>
<td>1982</td>
<td>164</td>
<td>39 360</td>
<td>2 265</td>
<td>13 333</td>
</tr>
<tr>
<td>Total</td>
<td>1979</td>
<td>685</td>
<td>164 400</td>
<td>4 893</td>
<td>88 617</td>
</tr>
<tr>
<td></td>
<td>1982</td>
<td>870</td>
<td>208 800</td>
<td>8 043</td>
<td>98 945</td>
</tr>
</tbody>
</table>

Assumptions: 240 days p.a. One 8-hour shift worked only.

and 176% for the area north of the Auckland Harbour Bridge. By 31 March 1982 the same comparison gives 238 and 197%, respectively.

It is likely that pressure on the available resource will increase considerably over the next few years with one of three consequences gaining the ascendancy:

1. Because demand exceeds supply, the price of wood increases until market equilibrium is reached. Higher royalties may be paid, especially for quality material.

2. Because sawmill capacity is greater than the acceptable material available, political pressure may be applied to overrule the normal rules of supply and demand. This could lead to forest overcutting particularly of private areas not under sustained yield management, and perhaps areas under State control by edict of government.
(3) Suitable logs may be transferred into the region to ensure that the sawmills are working to capacity. This is unlikely, however, because of the high cost of transport.

The following section on Yield Forecasts shows a greater resource present than is currently being utilised. These stands are considered unavailable by growers and sawmillers alike because of size and quality. Rather than cut these, commercial considerations may simply cause an increase of timber imports to the region. The current problem is a lack of forest maturity outside those areas under sustained yield management. Even within those forests which are, there are large volumes of unacceptable species that go to make up the "supposed volumes available" shown in Table 7 — e.g., *P. palustris, P. pinaster*.

**Local Demand**

The demand for sawn timber in Northland has been projected to the year 2000 (Table 6). Population increase expected has been based on the Statistics Department medium fertility, low migration projection and the assessed Northland *per capita* consumption of sawn timber. These demand figures indicate that Northland will not be self-sufficient for timber until the mid- to late 1980s.

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Sawn Timber Demand ( (m^3(s)) )</th>
<th>Sawlogs Required ( (m^3(r)) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979</td>
<td>105 260</td>
<td>46 262</td>
<td>100 570</td>
</tr>
<tr>
<td>1980</td>
<td>105 550</td>
<td>45 946</td>
<td>99 883</td>
</tr>
<tr>
<td>1982</td>
<td>107 140</td>
<td>47 235</td>
<td>102 685</td>
</tr>
<tr>
<td>1985</td>
<td>110 170</td>
<td>71 031</td>
<td>154 415</td>
</tr>
<tr>
<td>1990</td>
<td>114 720</td>
<td>66 495</td>
<td>144 554</td>
</tr>
<tr>
<td>1995</td>
<td>118 830</td>
<td>70 588</td>
<td>153 452</td>
</tr>
<tr>
<td>2000</td>
<td>124 680</td>
<td>54 545</td>
<td>118 576</td>
</tr>
</tbody>
</table>

N.B.: 46% conversion from \( m^3(r) \) to \( m^3(s) \) assumed.

Table 5 giving sawmilling statistics for the years ending 31 March 1979 and 31 March 1982 shows that 48 245 \( m^3 \) (s) and 50 072 \( m^3 \) (s) were sawn in those years. By comparison with Table 6 it would appear that the supply of sawn timber approximately equates with the demand. Statistical data indicate that transfers in and out of the region are comparable.
TABLE 7: HARVEST YIELD FORECASTS SUMMARY, GENERALISED FOREST TYPES — NORTHLAND FORESTRY DEVELOPMENT PLAN
(Northland Planning District (30.6.80); All Counties; Annual Yields 000s m\(^3\); All Ownership; Domestic Processing Scenario)

<table>
<thead>
<tr>
<th>Year/Period</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>4th</th>
<th>5th Total</th>
<th>6th</th>
<th>7th</th>
<th>8th Total</th>
<th>Northland Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BIG LOGS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-80</td>
<td>8</td>
<td>30</td>
<td>7</td>
<td>45</td>
<td>31</td>
<td>60</td>
<td>58</td>
<td>149</td>
<td>194</td>
</tr>
<tr>
<td>1981-85</td>
<td>6</td>
<td>33</td>
<td>4</td>
<td>43</td>
<td>29</td>
<td>59</td>
<td>57</td>
<td>145</td>
<td>188</td>
</tr>
<tr>
<td>1986-90</td>
<td>11</td>
<td>47</td>
<td>12</td>
<td>70</td>
<td>31</td>
<td>65</td>
<td>50</td>
<td>146</td>
<td>216</td>
</tr>
<tr>
<td>1991-95</td>
<td>151</td>
<td>65</td>
<td>4</td>
<td>233</td>
<td>36</td>
<td>59</td>
<td>58</td>
<td>153</td>
<td>386</td>
</tr>
<tr>
<td>1996-00</td>
<td>467</td>
<td>130</td>
<td>3</td>
<td>627</td>
<td>184</td>
<td>105</td>
<td>86</td>
<td>375</td>
<td>1002</td>
</tr>
<tr>
<td>2001-05</td>
<td>692</td>
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<td>6</td>
<td>1012</td>
<td>419</td>
<td>389</td>
<td>100</td>
<td>908</td>
<td>1920</td>
</tr>
<tr>
<td>2006-10</td>
<td>809</td>
<td>212</td>
<td>184</td>
<td>162</td>
<td>1367</td>
<td>423</td>
<td>376</td>
<td>123</td>
<td>2289</td>
</tr>
<tr>
<td>2011-15</td>
<td>636</td>
<td>425</td>
<td>394</td>
<td>1652</td>
<td>445</td>
<td>339</td>
<td>134</td>
<td>918</td>
<td>2570</td>
</tr>
<tr>
<td><strong>SMALL LOGS</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-80</td>
<td>20</td>
<td>13</td>
<td></td>
<td>35</td>
<td>9</td>
<td>11</td>
<td></td>
<td>20</td>
<td>55</td>
</tr>
<tr>
<td>1981-85</td>
<td>67</td>
<td>12</td>
<td></td>
<td>81</td>
<td>17</td>
<td>19</td>
<td>8</td>
<td>44</td>
<td>125</td>
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<tr>
<td>1986-90</td>
<td>95</td>
<td>17</td>
<td></td>
<td>105</td>
<td>26</td>
<td>27</td>
<td>11</td>
<td>64</td>
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<td>1991-95</td>
<td>156</td>
<td>19</td>
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<td>202</td>
<td>31</td>
<td>39</td>
<td>18</td>
<td>88</td>
<td>493</td>
</tr>
<tr>
<td>1996-00</td>
<td>333</td>
<td>102</td>
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<td>311</td>
<td>54</td>
<td>39</td>
<td>25</td>
<td>118</td>
<td>954</td>
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<tr>
<td>2001-05</td>
<td>406</td>
<td>177</td>
<td></td>
<td>437</td>
<td>89</td>
<td>54</td>
<td>20</td>
<td>163</td>
<td>1279</td>
</tr>
<tr>
<td>2006-10</td>
<td>310</td>
<td>228</td>
<td></td>
<td>550</td>
<td>91</td>
<td>49</td>
<td>20</td>
<td>160</td>
<td>1356</td>
</tr>
<tr>
<td>2011-15</td>
<td>207</td>
<td>298</td>
<td></td>
<td>650</td>
<td>92</td>
<td>39</td>
<td>23</td>
<td>174</td>
<td>1489</td>
</tr>
<tr>
<td><strong>INDUSTRIAL WASTE 35% OF BIG LOGS</strong></td>
<td></td>
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<tr>
<td>-80</td>
<td>2</td>
<td>10</td>
<td></td>
<td>14</td>
<td>8</td>
<td>22</td>
<td>21</td>
<td>51</td>
<td>65</td>
</tr>
<tr>
<td>1981-85</td>
<td>2</td>
<td>12</td>
<td></td>
<td>16</td>
<td>9</td>
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<td>65</td>
</tr>
<tr>
<td>1986-90</td>
<td>4</td>
<td>16</td>
<td></td>
<td>24</td>
<td>10</td>
<td>22</td>
<td>17</td>
<td>49</td>
<td>73</td>
</tr>
<tr>
<td>1991-95</td>
<td>52</td>
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<td>81</td>
<td>12</td>
<td>20</td>
<td>20</td>
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<tr>
<td>1996-00</td>
<td>162</td>
<td>45</td>
<td></td>
<td>217</td>
<td>63</td>
<td>36</td>
<td>30</td>
<td>129</td>
<td>346</td>
</tr>
<tr>
<td>2001-05</td>
<td>241</td>
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<td>353</td>
<td>147</td>
<td>136</td>
<td>35</td>
<td>318</td>
<td>671</td>
</tr>
<tr>
<td>2006-10</td>
<td>282</td>
<td>65</td>
<td></td>
<td>478</td>
<td>148</td>
<td>133</td>
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<td>802</td>
</tr>
<tr>
<td>2011-15</td>
<td>223</td>
<td>69</td>
<td></td>
<td>149</td>
<td>579</td>
<td>156</td>
<td>118</td>
<td>321</td>
<td>900</td>
</tr>
</tbody>
</table>

Yield Forecasts

The latest yield forecasts for all of Northland (i.e., both State and other owners) were prepared by the NZFS for the 1981 F.D.C. and the Northland Forestry Development Study 1981. The "timber availability" forecast of this study is shown in broad outline in Table 7. It is not, however, a supply projection because a lot of assumptions about availability are required to generate such a projection.

Some broad conclusions can, however, be drawn about the future availability of supplies.

(1) The mature resource at present is in such a form that any substantive increase in availability of sawlogs, above current levels being sawn (approximately 120,000 m³ (round)), is unlikely until the plantings of the 1960s begin to mature (between 1986 and 1995 depending on the wishes of timber growers and users).

(2) While smallwood availability levels from thinnings have increased substantially (particularly through the sale ex Aupouri S.F. of 50,000 tonnes) there is insufficient available to start even a MDF or particleboard mill of economic size until the late 1980s.

(3) Export of chips from smallwood and residues may be a viable short-term use but transport distances and the lack of suitable port facilities make this option somewhat adventurous.

(4) Before the year 2000, if the planting rate holds up, there should be sufficient resource to start one mechanical (or semi-mechanical) pulp mill in Northland, probably heavily dependent on supplies ex Aupouri S.F. Mechanical pulping trials on radiata pine from this forest have produced pulps of high quality suitable for newsprint or magazine papers.

CONCLUSION

The first 160 years (1770-1930) of European impact on forestry in Northland can only be described as disastrous for the region's forests. What was originally a truly magnificent estate of one million hectares of the best softwoods in the world was virtually annihilated to generate a pastoral economy. Despite the importance of agriculture to Northland today, the poor soils and difficult conditions have not produced the rich pasture dreamed of at the time of original settlement. In fact, large areas have reverted to scrub and bush or become choked with noxious weeds and are not contributing anything to the region's economy.
Since 1903, exotic afforestation with a variety of species, mainly radiata pine, has slowly but surely produced a forest estate which, although pitifully small compared with the original indigenous estate, is nevertheless significant for the region's economy. The next 50 years appear likely to see this estate expand, provide sustainable wealth for local use and exports and perhaps once again forestry can be a vital industry in the region.

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