

to construct a straw man. He argues that the advocates for the latter (the diamond mine, a.k.a. species or regimes of longer rotations) follow a simplistic "diamonds or coal" philosophy — that is, the higher price is the better choice. He then proceeds to lay a match to the straw.

This would all be well and good if his mythical straw man existed. Unfortunately for Piers, it does not. He misrepresents the argument. The advocates for longer rotations, different species, more 'conservative' regimes, and diversity do so for many more reasons than mere mill-door price, or mere cost of capital. To return his pejorative — he simplifies the issue to one of straight finance, to capital, discount rates and cash flows.

There are broader, non-quantifiable issues to consider, related to "strategy". The issue Piers is really one of "*what ought to set strategy?*" — financial criteria? or a broader perspective taking into account market preferences, the actions of competitors, and where a company wishes to position itself for whatever reason?

Focusing, as Piers does, on "farming capital" as the apparently all-encompassing criteria only emphasises a production mentality coupled with a Romney-like tendency to run with the flock. This may be the appropriate strategy for some, but others, I am sure, would far rather focus on building a mousetrap (for want of a better analogy) that puts them in a sellers' market, and where risk is reduced through

options.

There is an old adage that designing the "best" mousetrap will not ensure future success: to that we should add — nor will the cheapest! Cost of capital is a relevant consideration, but not in the sense of its minimisation at the expense of reason.

Rejoice at the diversity of strategies, Piers. Long-term is not necessarily more risky, but chasing the highest theoretical future return using past financial data almost certainly is! Rather like driving while gazing in the rear-vision mirror. Throw a grain of salt on your spreadsheet.

Chris Perley



CONFERENCE PAPERS



Sustainable management of private native forests in New Zealand: what's in it for the landowner?*

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Abstract

The 1993 amendment to the Forests Act (1949) (hereinafter referred to as the Forests Act) requiring that private native forests be managed with minimum impact, with due regard to flora and fauna, natural and amenity values, and protected from a variety of threats, has caused us to expand our approach to forest management beyond the timber. We must now meet the challenge of harvesting our native forests and undertaking monitoring, silviculture and protective management to a standard rarely aspired to, or achieved, in the past.

The Forests Act has curtailed an historically opportunistic, exploitative approach to forest use, and while the changes have attracted a negative reaction from a number of landowners there are glimmerings of interest by many in the idea that they can have their cake and eat it too, albeit in smaller mouthfuls. They are facing up to change and approaching the challenges of managing, processing and marketing the traditionally abundant timber species, little used species of limited resource, and some, present as relatively large resources, but not previously

favoured by the timber industry.

*The future New Zealand native timber market will revolve around a relatively small but continuous supply of predominantly southern beeches (*Nothofagus* spp.), rimu (*Dacrydium cupressinum*), and broadleaved hardwood species such as tawa (*Beilschmiedia tawa*). Better timber utilisation and an upward shift in timber prices may in part, at least, compensate for the higher standards of forest management demanded by our society and reflected in the Forests Act.*

Introduction

The 1.3 million ha of privately-owned native forest in New Zealand represents 20% of our native forests; a similar area to New Zealand's plantation forests. Much of this forest is located on steep terrain and has either been subject to exploitation for the most profitable timber species in the past, or has been difficult of access for traditional harvesting methods and similarly not suitable for agricultural development. The forests are classified by the Ministry of Forestry (1996) as about 10% potentially commercially available, 40% currently unavailable (due to low timber volumes or previous harvesting), and the remaining 50% as protection forest. While the use of helicopters and on-site milling using portable equipment has blurred the boundaries between these categories it is a fair guess that about 50,000 ha of the

private native forests remaining have potential for long-term management for timber production, with a further 130,000 ha of Crown-owned forest dedicated to management for timber production, albeit at low levels compared to plantation forests.

This paper describes, mainly in anecdotal fashion, the diverse reactions of private landowners to the introduction of this legislation and outlines some of the challenges in moving towards a viable industry based on sustainably-managed native forests.

Forest Owner Support for and Opposition to the Legislation

With the expiration in 1996 of the Transitional Provisions of the Forests Act, unsustainable timber harvesting from freehold land is a thing of the past. Many landowners have openly supported sustainable management of our remaining private native forest and are prepared to work with the legislation. A positive attitude is evident in the formation of an 'Indigenous Forestry Section' of the NZ Farm Forestry Association, where landowners are sharing their knowledge and enthusiasm for the protection, management and enhancement of their forests. This enthusiasm is further demonstrated in the Association's collaboration with the NZ Ministry of Forestry in compiling a user handbook on Indigenous Forestry.

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While this group acknowledges a number of practical problems in implementing the legislation (largely a problem of interpreting ecological understanding and silvicultural practice), nevertheless there is a focus on the positive outcomes of having a common philosophy and direction for native forest management and utilisation.

The contra view has been promulgated by a group calling itself the Federation of Indigenous Forest Owners, which espouses the view that the Forests Act in its present form, and other recent legislation, is unconstitutional and contravenes their rights as expressed in the Magna Carta which forms the basis of our constitutional law. This group tends to reflect the view of those landowners who regard their forests as a bank from which withdrawals of more than the interest (increment) accrued can and should be made at any time of their choosing, without restraint on liquidation of the capital (entire resource), either to facilitate further farm development or, at a more basic level, to keep the wolf from the door during times of poor farm economic performance. In recent times, returns from some of our agricultural products (e.g. beef and wool) have been so low that farmers have looked to their forests, both native and plantation, as a readily exchangeable source of funds. This reflects the view that the end justifies the means, irrespective of whether the forest is well managed or not. Many owners have also stated that they are managing their resources on a conservative basis and do not need legislation to ensure that their good stewardship of the land continues. While this may be true for some, there have been sufficient examples of purely exploitative forest clearance to encourage Government to establish the framework for native forest management.

There appears to be a growing acceptance of the desirability of retaining our remaining native forests, either through outright protection or management on a sustainable basis. At March 1997 there were 35,000 ha of private native forest under either approved, or proposed, long-term Sustainable Forest Management Plans, providing for a conservative annual harvest of about 57,000 m³ of roundwood timber (Ministry of Forestry pers. comm.). The increasing interest in and lodgement of draft Sustainable Forest Management Plans in the last 12 months suggests that this figure will rapidly increase.

For those forest owners who value their native forests, and who want to see them protected and enhanced, the requirements of the Forests Act have been welcome, since everyone, with one or two exceptions, is now on an even playing field, or at least as even as one can get given the regional differences which may

occur through the application of the Resource Management Act (1991) land use consent process by territorial authorities. In fact, the Resource Management Act has the potential, given the regional focus and public consultation process embodied in its implementation, to enhance the development of native forest management on private land by providing additional teeth to implement the intent of the Forests Act.

Impacts of the Legislation on Forest Values

For owners who purchased native forest with the expectation that they would at some future time capitalise on any increased value of their land and forest, either by harvesting the forest unsustainably (common before 1993, and possible through the Forests Act Transitional Milling Provisions up to 1996), or by selling the forest intact at some future time, the Forests Act has appeared particularly draconian, since the difference between the liquidation value of the forest and the present value of a perpetual stream of timber revenues may be up to an order of magnitude. Furthermore, the land, rather than being valued under an alternative use, in addition to the total value of the timber standing on it, is now simply part of a forest valued as a going concern.

An example of this is a beech forest reviewed by the author. While the liquidation value of the forest pre 1993 is estimated to be have been \$6500 ha⁻¹, the present value of the forest under sustainable management is about \$750 ha⁻¹, based on harvestable growth. In another example, the timber from a podocarp forest estimated by the author to have had a liquidation value pre-1993 of \$4000 ha⁻¹ has a present value of about \$700 ha⁻¹ inclusive of compliance costs (Resource Management Act and Forests Act).

Such impacts of the introduction of sustainable forest management legislation are not lost on many landowners, who feel that the Crown should bear the cost of applying a new set of rules for land use.

From a forestry perspective such examples revive the old debate about using discounted cashflow analysis to value long-rotation crops, especially those from native forests, without taking into account all the other benefits which accrue as a result of long-term management. In general, the landowner agrees with the conservation argument behind sustainable management, but when the question is put to him the answer is often 'not at my expense'! Green power and the nation's determination to protect natural resources for future generations have caught up with him!

For some forest owners, the passing of

the amendment to the Forests Act represents an immediate and substantial impact on the present and future value of their forests. However, the Forests Act specifically rejects the possibility of any compensation to forest owners disadvantaged by the changes.

Challenges for Forest Owners *Maintaining the Forest System*

With the Forests Act come some very significant challenges. The requirement for the sustainable management of native forests by "*... maintaining the ability of the forest growing on the land to continue to provide a full range of products and amenities while retaining the forests natural values*" carries with it the implication that the forest owner either has the tools, or must acquire them, to adequately describe and monitor his forest. It assumes also that we have the knowledge to identify change caused by forest management compared to forest successional change, change brought about by fluctuations in pest populations and even global warming. This suggests we have an adequate understanding of our native forest ecology and we are capable of using this understanding to produce timber at non-diminishing levels from forests containing several timber species with different characteristics and management requirements while, at the same time, retaining the forest's structure and character. In practice, New Zealand is little different from most other countries; the development of sophisticated stand models and management systems has generally been restricted to single species with segregated age classes. Further, most such examples focus solely on wood production.

The intent of the Forests Act sets seemingly simple standards, for example:

- retention of forest structure and character;
- protection of natural values;
- sustainability of wood production;
- attainment of post-harvest regeneration.

The monitoring and demonstration of achievement of these standards at the highest level is, however, a task that could be beyond the financial and technical capabilities of many forest owners unless a degree of pragmatism is brought to bear. For most forest owners this would include:

- ensuring harvests are realistic if not conservative;
- measuring growth rates of the commercial timber species to confirm assumptions of sustainable harvest levels;

- ensuring, through monitoring and intervention, that regeneration of the harvested species occurs;
- utilising low-impact silvicultural systems which mimic natural replacement processes to protect natural values.

Forest Protection

The requirement that forests under management are protected from pests, weeds, fire and domestic stock carries further challenges. In various parts of the country the possum has triggered the collapse of a number of tree species, most significantly totara (*Podocarpus totara*), and a number of broadleaved hardwood species. Of the other introduced wild animals and pests in New Zealand, the goat, particularly in the North Island, is probably the single largest threat to the regeneration of forest, managed and unmanaged. In terms of native wildlife, we have the cat, stoat, weasel and rat which pose a major threat to many of our avifauna species.

Most private owners will need to call on professional forestry advice to monitor the condition (health and structure) of their forest. Observing the main canopy species, sub-canopy recruitment and a number of indicator species within permanent plots, along with visual inspection and descriptive records, may provide sufficient information for precautionary sustainable management, especially if unmodified forest exists locally as a benchmark for assessing change.

Forest Management Information

With the progressive reduction in timber harvesting from Crown-owned native forests, the restructuring of government departments since 1987, and the passing of sustainable management legislation, the resources for traditional native forest management research have vanished. There have been relatively few recent advances in our knowledge of the new native forest management now required in New Zealand, other than some operational research in the remaining Crown forests under active management, where funds have been committed to expanding the owner's knowledge of the forests' ecological processes, resource database and low-impact silvicultural options.

The forest owner has access to scientific and management reports, most relating to the past management of Crown-owned forest, now part of the Conservation estate, but not always with the desired geographical representation and species coverage. If owners are not dealing with the southern beeches, one or two of the podocarps, kauri (*Agathis australis*) and tawa, they may have a fairly limited information base from which to prepare a comprehensive management proposal for their forests.

Opportunities for Native Forest Owners in the 21st Century

Past and Future Production

Native timber production (Fig. 1) has declined to the lowest levels recorded in recent history.

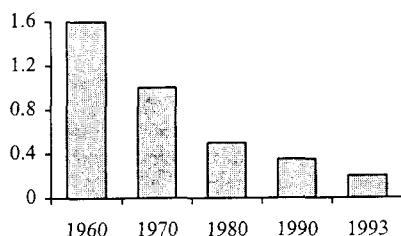


Figure 1. Production of roundwood from indigenous forests (million m³). (Source: Ministry of Forestry 1996, p. 16,17)

Log production for the year ended March 31, 1993 was c. 206,000 m³ including 72,000 m³ of hardwood chip. With the expiration of the Transitional sawmilling provisions of the Forests Act in July 1996, it is anticipated that national native roundwood production will have fallen further to about 150,000 m³ for the year ended March 31, 1997. However, it is expected that with the increasing numbers of applications being received for the harvesting of native timber under sustainable forest management plans and permits, and the increasing interest in managing the relatively fast-growing beech forest, native roundwood production will return to 1993 levels by the turn of the century and will quickly surpass them.

Of the rough-sawn timber produced for the year to March 31, 1993, rimu constituted 83% (Table 1).

Table 1. Rough-sawn timber production ('000m³)

Species	Year ended March 31				
	1960	1970	1980	1990	1993
Rimu/miro	546	325	132	68	55
Kauri	4	4	4	-	2
Other softwoods	165	84	15	3	3
Beech	33	26	19	10	4
Tawa	46	24	15	6	2
Other hardwoods	8	1	1	-	-
Total	802	464	186	87	66

Source: Ministry of Forestry 1996, 28, 29.

For those Sustainable Forest Management Plans approved and proposed, more than 80% of the anticipated harvest will be beech. With the development of management proposals for the Crown's beech-dominated forests dedicated to timber production, this trend towards beech will progressively apply across the board. In

the medium term, the biggest impacts of sustainable forest management in New Zealand will be:

- the rapid eclipsing of rimu by beech as the most abundant species and, on a smaller scale, the resurgence of managed tawa as the most important native hardwood in the North Island; and
- the direction of much greater effort to increasing the proportion of high-graded timbers by recutting to smaller piece sizes and reconstitution to maximise value and minimise waste.

Silvicultural Systems

The keys to the sustainable forest management provisions of the Forests Act are found in the requirements for low-impact harvesting techniques; single tree/small group harvesting and, where appropriate, coupe harvesting; and ensuring forest regeneration through positive action:

- Traditional native timber harvesting methods like the large cable hauler capable of clearing 30 - 40 ha in one setting are gone. Future cable systems will need to be smaller, more manoeuvrable and managed with high precision to minimise forest damage and utilise regularly-spaced haul lanes over repeated harvests. Ground-based machinery will similarly need to be smaller and particular emphasis will be placed on the use of permanent forest tracks, and utilising winches to move logs rather than disturbing a high proportion of the forest floor by moving the machine to the tree. Small portable cable systems capable of suspending the log are being tested and may also have a place. The availability of helicopters capable of lifting logs up to 5 t will avoid the need for expensive and sometimes environmentally damaging roading, and will encourage management of forest areas previously thought to be economically inaccessible.
- The requirement for single tree/small group harvesting of softwoods and shade-tolerant hardwoods, and the limit of a 0.5 ha maximum coupe size for beech and light demanding hardwoods, recognises the desirability of mimicking natural forest replacement processes (which typically occur over areas of 0.1 - 0.2 ha or less), as a means of protecting natural values and minimising forest impacts.
- Detailed prescriptions requiring artificial restocking of managed forest where natural regeneration fails is the third important provision of the amendment to the Forests Act. For those species, such as our podocarps, which often exhibit replacement pat-

terms associated with periodic major disturbance events, this will provide a degree of continuity not previously guaranteed by past practices, although one might ask whether this is in fact altering the character and structure of the forest in the long term.

Obtaining True Value

With the cessation of unsustainable harvesting, there is scope for the owners of small native forests to obtain more realistic prices for their timber, although, like everything, competition from substitute timbers and other materials will influence the economics of native forest management. The price for the high-quality timber grades will ultimately determine the success of sustainable management.

Prices being paid for standing timber of some species are increasing as availability to the sawmiller declines. A tightening of supply may provide further opportunities for forest owners to develop niche markets for a variety of quality timber species, softwood and hardwood, which have not traditionally been of interest to most timber processors and manufacturers who have previously relied on abundant and relatively cheap supplies of versatile timbers like rimu and southland silver beech (*Nothofagus menziesii*).

There have been one or two examples during 1996-1997 of forests being offered for sale as 'going concerns' under registered management plans or permits. This is a positive spin-off of the legislation, where a purchaser of native forest can buy into an enterprise which has a reasonably predictable revenue stream and, equally importantly, has been through all the necessary bureaucratic hoops. There is thus

the beginnings of a market in managed private native forests which may fulfil the needs of those owners who wish to capitalise on their interest in the forest. Such developments should put managed native forests on a footing more comparable with that of woodlots and plantations which are traded in New Zealand on a regular basis.

The Native Forest Owner - Post 2000

The General Manager of Agriculture New Zealand (farm consultancy services), was quoted in the Rural Garden magazine in 1996 as saying that large corporate farms will dominate farming within ten years. His basis for saying this is that the profit from small farms (about 3000 stock units on 300 ha), is insufficient for all but minimal family cash drawings and their viability is in doubt. "These farmers will be the new lifestyleers" who derive much of their income off-farm. Further, he identified the advantages of large corporate owners as purchasing and marketing power, access to information, technology, know how and capital and economies of scale. There are already signs in New Zealand that a few corporate owners of native forests are interested in expanding their operations by purchasing forestry rights from small forest owners, bringing with them the necessary start-up capital, forest planning, management expertise and access to timber markets.

Similarly, there is scope for owners of small native forests to enter into cooperatives for the efficient management of their collective forest resources. (The Forests Act provides for forests under separate ownership to be managed under one Sustainable Forest Management Plan.) For those owners who have not the capital,

expertise or time to implement sustainable forest management on their properties independently such a venture will be an attractive option. It can provide the scale necessary to be able to employ professional management expertise and, for some, may be the only way they can maintain their agricultural/forest unit as a viable enterprise.

Conclusion

While much of this paper has focused on the challenges faced by owners of native forests in adjusting to a new regime, it is encouraging that many of them are taking the opportunity to place the management of their forests and, equally importantly, the marketing of their forest produce on a sustainable footing. Some are also looking at means of applying eco-labelling to their products. Judging by the forest certification and eco-labelling initiatives worldwide, New Zealand owners should move now to develop quality management of their forests for the time when consumer preference for timber products from sustainably-managed forests has a significant impact on markets at home and overseas.

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Deciduous hardwood species – early silvicultural options for growing timber on farms*

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Summary

Although introduced softwood coniferous species dominate New Zealand's timber resource, there is increasing interest in deciduous, broadleaved hardwoods. Small private growers (mostly farmers) have the best sites and most potential to grow a

hardwood resource. This paper describes a five-year trial aimed at determining the most practical early silvicultural options for growing timber from deciduous hardwood species on farms. The trial involved 15 species. There were nine deciduous hardwood species (*Quercus canariensis*, *Q. petraea*, *Q. cerris*, *Fraxinus excelsior*, *Ulmus x hybrid 'Loebel'*, *Prunus avium*, *Castanea sativa*, *Paulownia fortunei*, *Robinia pseudoacacia 'Jaszkeri'*), four evergreen native species (*Nothofagus solandri*, *Dacrycarpus dacrydioides*, *Podocarpus totara* and *Kunzea ericoides*), and two evergreen introduced conifers

(*Pinus radiata* and *Cupressus macrocarpa*). Silvicultural treatments involved form pruning, coppicing, plastic treeshelters plus a control. The aim was to produce a target sapling tree with a straight, defect-free stem at least 3 m in length, within as short a time as possible. The most successful treatments were form pruning and standard (ground level) treeshelters. Using these treatments, target size was achieved after only three years in some species. By age five the best treatments had achieved target dimensions in over 50% of trees in nine of the 14 species.

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