



Sustainable management of indigenous forests in New Zealand

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Abstract

The New Zealand Government's Indigenous¹ Forest Policy Goal is "to maintain or enhance New Zealand's indigenous forests in perpetuity". To accord with the policy, the Forests Act 1949 was amended in 1993 to provide for the sustainable management of native forests. The main change is that the Act now requires landowners who wish to harvest and mill native timber to have a registered sustainable forest management plan or permit.

The Act defines sustainable management as "the management of an area of indigenous forest land in a way that maintains the ability of the forest growing on that land to continue to provide a full range of products and amenities in perpetuity while retaining the forest's natural values".

Four years have now gone into developing a management system that promises to fulfil ecological, economic and social criteria for native forests. The system aims to retain and ultimately enhance native forests through ecological silviculture. Much of New Zealand's existing native forest possesses the main structural attributes to practise single-tree or group selection systems by low-impact harvesting.

The management system engages the principles of harvesting annual or periodic growth increment, maintenance of species and age-class integrity, and regeneration, of New Zealand's mainly beech and podocarp forests. It covers the system of documentation and monitoring, and research development, e.g. helicopter and cable harvesting, single-tree and

small group extraction, and our prediction is for the success of near-natural silviculture in New Zealand.

The central theme of this paper is that ecologically sustainable, economically viable and formalised management of about 650,000 ha of New Zealand native forest, for timber production, is realistic.

Introduction

Native forests are the backdrop to the distinctive scenic quality of New Zealand's landscape. Once New Zealand's predominant vegetative cover, these forests have a history of intense exploitation and diminishing area. Established exotic forest plantations have, since 1960, replaced the depleted native timber supply. At the same time, building public support for conservation of native forest resources gave rise, in 1993, to legislation for the sustainable management of remaining native forests.

Natural History

At the end of the first millennium AD, when settlement in New Zealand began, most areas below the natural tree-line were covered in forest, i.e. some 75% of the land area (McGlone 1983). By the late 1800s clearance for settlement had reduced the forest cover to some 50% of the land area. By 1920 continuing sawmilling and farm development had almost run its course in reducing forest cover to some 25% of the land area (Roche 1990). Today the native forest cover remains at 24% (6.4 million ha) of the country's land area (27.1 million ha).

Native Forest Types

The many New Zealand native forest types can be grouped into two major forest categories, namely podocarp-hardwood forests (Fig. 1) and beech forests. Forest types are often mixed, and differences of timber quality, forest composition and accessibility have influenced forest clearance and management. Podocarp-hardwood forests generally

favoured lowland areas and because of relatively easy access, location on potential farmland and high timber quality, these forests were cleared extensively and suffered most in terms of their remaining area. *Nothofagus*, 'southern beech' forests, mainly occupy higher, drier and less accessible montane situations. Inaccessibility, less marketable timbers and a tendency to poorer soils, explain why the beech forest type has been less affected by clearance. New Zealand forests developed in geological isolation and have a unique ecological assemblage. Ninety per cent of the species are endemic to New Zealand. In the past, forest destruction was justified by the argument that New Zealand's unique vegetation and geography made it impossible to follow sustainable management practices developed overseas. It was believed any type of thinning could not be done without absolute destruction of the forests. Slow growth rates, of 200-600 years for podocarp and 80-200 years for beech forests, to reach maturity, led early scientists to believe that native trees lacked the vigour for successful regeneration, and that the native flora was giving way to stronger invading species (Roche 1990). This view was prevalent in the 1970s. It was, for example, used widely by the New Zealand Forest Service to support 'exotic enrichment' planting and 'exotic conversion' of native forests (Conway 1977).

Development of Legislation

If we look back in time, it is sobering to discover the advanced deliberations on sustainable management of native forests in New Zealand of more than 100 years ago. Papers debating the merits of continuous cover forestry as opposed to the needless destruction of natural forests were presented to the Houses of the General Assembly in Wellington, recorded by Hansard in 1874. The apparent inexhaustibility of forests was questioned for the first time. Forest conservation was the basis of the Forests Act 1874, which

¹ 'Indigenous' is the preferred word for flora occurring naturally in New Zealand. 'Native' is the preferred synonym in Australia, and is substituted for the word 'indigenous' in this paper except where specific to NZ legislation.

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marks the time when sustainability of forest resources was first raised. Suggestions were made for sustained-yield management on the basis of rotation cycles of even-aged stands with cleared areas left to regenerate. Although already common in European countries, in the 1880s the New Zealand argument for keeping significant areas of forests for a permanent timber supply was too innovative to challenge the primacy of agriculture and the Act was repealed in 1885. Forest destruction was hastened by the persistent belief that the sale of native forest land to freeholders was the best way to protect native forest resources from the sawmillers' wasteful logging practices that predominated. It was believed that farmers who owned their forest blocks on freehold properties would take best care of the land and would be less inclined to fell them wastefully. However as most sections proved to be too small for economic farming, farmers were forced to clearfell forests in order to survive (Roche 1990). Until the advent of the Resource Management Act 1991 there were few regulations about clearfelling of native forests on private land.

Sustainable Management Introduced

Until 1976, lobbying by environmental groups was hampered by the lack of avenues for public participation in forest management decisions over public land. The Forests Amendment Act 1976, for the first time, made provision for formal public input into forest policies.

The indigenous forest policy, revised in 1976, advocated perpetuation of forests as natural forests and as managed stands. Timber supply was a major aspect of the policy, and clearance of native forests was still seen as a source of land for extending farms or for plantation forestry. The Maruia Declaration in 1977 by a conservation group, the Native Forest Action Council, marked a turning point in the political sensitivity to forest conservation. Parliament was petitioned to end native forest harvesting by 1978 and protect all native forests. For reasons of native forest conservation, but mainly a general State-led deregulation of the economy, the long-standing New Zealand Forest Service, responsible for State native forests since 1921, was disestablished in 1987, and a new Department of Conservation came into being. The new Department, as the national heritage management agency, was allocated State native forest resources suitable for conservation, amounting to some 80% of all native forest (5 million ha) and 19% of New Zealand's total land area. The management of State native production forests, already the subject of sustainable management plans, was delegated to State-owned companies

(144,000 ha, 0.5% of NZ land area). Government sectoral-regulatory functions became the responsibility of the Ministry of Forestry.

Forests Act 1949 Amended by the Forests Amendment Act 1993

The Forests Act 1949 was amended in 1993 to look beyond unsustainable exploitation and establish the natural values of native forests on an equal footing with their commercial values. The Act affects the milling of native timber, which is now restricted to forests with a sustainable management plan or permit. The yield of timber available for harvest is restricted to the growth increment of species within particular forest types, and there is to be minimal impact on ecological values from harvesting. Export of native timber is confined to produce from sustainably-managed forests, or timber manufactured into finished products. Harvesting prescriptions, and export and timber milling regulations, are incorporated in the Act, which was administered by the Ministry of Forestry.

Encouraging Sustainable Management – Indirect Controls

Responsibilities of Exporters

Exporters must declare their export produce by sending a notification of goods for export to the Ministry of Forestry. Inspection of the produce and approval of the notification is a prerequisite for customs clearance. The main exports allowed are:

- beech or rimu sawn timber, provided the timber has been taken from an area registered for sustainable forest management;
- finished or manufactured indigenous timber products.

Responsibilities of Sawmillers

Sawmills must be registered to mill native timber and maintain records such that timber can be identified as the produce of a sustainably-managed area. The monitoring of sawmilling is the main control on the use of native timber. It is a step removed from a land-use control, and takes effect only when timber is milled. Native timber may be milled at a registered sawmill provided:

- the timber has been taken from an area managed in accordance with a registered sustainable forest management plan or permit;
- it was necessary to remove the timber for public works or property access;
- the timber is from dead or windthrown trees outside a plan or permit area;
- the timber has been approved for the

landowner's personal use (up to 50 m³ of roundwood per 10 years).

Landowners' Options for Harvesting Timber

The legislation reflects Government's desire that landowners recognise the value of their forested land in monetary and intangible terms, and voluntarily seek to protect or sustainably manage their native forest. Sustainable forest management plans and permits enable the harvesting of timber at a rate not greater than the ability of the forest to replace the timber removed either annually or periodically. The plan, for a larger area, or permit for smaller areas, is the forest inventory and silvicultural management system to be applied to particular forests. Once documented and approved, plan or permit must be registered as a caveat on the certificate of title to the land. A plan or permit may also be applied to a cutting right registered on a land title. The management system includes prescriptions which distinguish forest types, e.g. podocarp or beech forests, in terms of the methods by which they may be managed. For each year harvesting is proposed, an annual logging plan must be submitted for approval. Periodic harvesting is permissible, e.g. once every 10 years, under a logging plan approved for those years in which harvesting is to be carried out.

Sustainable Forest Management Permit

A sustainable forest management permit is suitable for small forest areas or for owners of larger forests who do not wish to manage their forests for a harvest of large quantities of timber under a plan. The principles of maintaining the forests' balance of amenities, products and natural values are the same for a permit as a plan. A permit enables:

- harvest of up to 250 m³ of podocarp and 500 m³ of beech roundwood, provided the quantity does not exceed 10% of the standing volume of timber;
- renewal after ten years provided forest growth has replaced the timber harvested under the previous permit.

Sustainable Forest Management Plan

The basis of a plan is the description and inventory of the land and forest area, appropriate management prescriptions, and any measures necessary to maintain and enhance soil and water and flora and fauna values. The detail of a plan includes:

- forest inventory of species and quantity to justify the proposed harvest by species and volume.
- management prescriptions that recog-

nise the specific growth habits of individual species and utilise present scientific and silvicultural knowledge to provide for timber harvesting while, at the same time, seeking to avoid forest degradation, e.g. through logging damage, or windthrow, and create conditions helpful to regeneration of the timber species removed.

- selective harvesting of trees likely to die in the near future, removal of single or small groups of trees using low-impact techniques, e.g. helicopter lifting of logs or suspended light cable hauler extraction.
- planting of seedlings raised from local seed, when necessary to guarantee replacement of species in place of each tree removed.
- the keeping of forest records detailing volume, type and destination of timber harvested.
- consultation with the Department of Conservation concerning representative areas which may be set aside from all future logging to protect specific flora and fauna or other identified conservation values.

Discussion

The changes to the Forests Act in 1993 came as a shock to many sawmill operators. The concept of sustainable forest management, embodied in the Act, which seeks to retain the natural integrity of forests, reversed the traditional idea of 'how long will it take to mill the forest and thus sustain the milling operation?' This new focus on sustainable management of forests themselves will in turn sustain a different milling industry.

A period of four years grace, for mills to register and adjust to the new sustainably-managed forests regime, ended in July 1996. The qualification for milling under the transitional provisions of the Forests Act was for each sawmill to statutorily declare its record of timber milled in the two years immediately preceding introduction of the legislation. Each sawmill that qualified for an 'allowable cut' was restricted to milling half of its previous annual cut of native timber.

Sawmills recorded a cut of just over 45,500 m³ of logs per annum for the four-year transitional period (total 183,974 m³). When added to the 76,500 m³ of logs per annum from West Coast Forest Accord land and Maori land, both of which were exempted from the 1993 Forests Amendment Act, the 122,000 m³ in total annual cut appears to be about the volume necessary for economically-viable, sustainably-managed timber production. The areas exempted from the Forests Act continue to produce about 50,000 m³ of logs per annum unsustainably. However,

these areas are the subject of current consultation aimed at complete coverage of the policy for native forests to be managed sustainably. Most of this volume is from the West Coast, one of the most important native timber supply provinces, where a native forest accord was agreed in 1986 by the Government, conservation groups, timber millers and Local Government authorities. The accord defined the areas of native forest and time-limits for the conclusion of unsustainable timber extraction. The deadline for cessation of unsustainable harvesting in forests under the Accord is 2006. The balance of unsustainably harvested timber is from a class of land allocated under the South Island Landless Maori Act 1906, allocated to provide income for certain South Island Maori people. Removal of the exemption of this land from the Forests Act requires consideration of the obligation to provide a comparable income base for these landowners.

Prior to the changes in the Forests Act the annual cut from forests subject to the Act was about 103,000 m³. Under half (45,500 m³) of this total was milled during the four-year transition period. A log volume of 29,000 m³ was forfeited, due to a number of sawmills carrying most of their allowable cut into the fourth year of the transitional period, and succumbing to the limitation of not being able to mill more than half of an allowable cut in any one year of the period.

Prices for dried sawn timber have roughly doubled since the introduction of the legislation. Rimu, for example, the main podocarp species milled, has lifted to around \$2000 m³. The number of sawmills milling native timber has also risen from around 300 when the Act came into force in 1993, to 350, the number currently registered. The types of sawmill have also changed remarkably in the last four years. In 1992 most sawmills milling native timber were permanently located, whilst today 75% of those milling native timber are portable. The change in milling style reflects the reducing volumes and increasing value of the timber. The economies of permanently-located sawmills and extensive roading has given way to helicopter transport of portable sawmills, logs or sawn timber. Gone are the days when forests were cleared and logs trucked to large permanent mills. Logging is now done by lifting out a few selected trees at a time, leaving the forest relatively intact to grow on.

The rules for sustainable management only really came into play from July 1996. Many forest owners have been slow to accept the importance of actively managing their native forest. Their doubts are understandable in view of the new law's

demands. For instance, the Act excludes the State from claims for compensation from landowners for loss of income from reduced timber production from forests which must now be managed intact, as opposed to previous harvesting by clear-felling. The likely returns from the sale of small quantities of timber and the cost of plans or permits need to be understood by forest owners and timber buyers alike. However the market has come to appreciate the real management costs of, and returns to be obtained from, specialised furniture and finishing uses for native timbers. More importantly native timber merchants and product manufacturers understand that timber supply will bottom out this year at about 60,000 m³ of logs, and then rise to sustainable levels of about 100,000 m³ of logs per annum, a little less than the 122,000 m³ shown to be more than adequate to support a viable market over the last four years.

There are prospects for a substantial increase in annual cut if appropriate silviculture lifts natural forest growth increment towards the sustainable site potential (Benecke 1996).

Current Sustainable Forest Management Proposals

Planning proposals from forest owners are being lodged at an average rate of one per week, indicating acceptance of the opportunity for viable sustainable management of native forests. Of the 141 proposals received to date, 99 plans and permits have been approved over 39,000 ha of forest and a further 42 applications are being processed for 9,000 ha. These proposals alone have the potential to produce sustainably around 57,000 m³ of logs annually. The pace is hotting up, as over half of the proposals were received in the last six months, and they cover only a fraction of the 650,000 ha of native forest area conservatively estimated to have real potential for sustainable management.

Up to the early 1990s, 85% of the sawn timber output was podocarp species (mainly rimu), with smaller quantities of beech and tawa. The predicted harvest under sustainable forest management plans expected to be approved and in operation by December 1997 will consist of 85% beech, with the remainder predominantly rimu, tawa and a number of less common species. The implications of this are that the existing stocks of podocarp timber in the market will soon diminish and pressure may come on its availability. However, the improvement in recovery of factory to clear-grade timber at the expense of building grades has meant that, overall, the availability of high-quality podocarp timber to the furniture and finishing timber trade has

not diminished.

In any event, change is occurring and those manufacturers remaining in the native timber and timber products market place will need to take this into account and plan accordingly. The changes are:

- prompting more owners of private native forest to seek to manage their forests sustainably;
- providing an incentive for improved processing and recovery practices;

- increasing the prominence of beech and other hardwoods in the native timber market.

Forest owners also have to make a great change in their understanding of how the forests can be managed for greater long-term economic benefit. Those who make this challenging transition successfully should find the forthcoming era of sustainable management of native forests rewarding.

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Beech Forest Management: Advancing the State of the Art

Report on a Workshop held at the School of Forestry April, 1998

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A workshop, Beech Forest Management: Advancing the State of the Art, was convened at the School of Forestry, University of Canterbury, April 17, 1998. The purposes of the workshop were to identify problems in beech forest management and potential remedies for those problems and to bring together researchers, academics, policy makers and others who see a cross-section of the indigenous forestry sector with practitioners such as foresters, timber merchants, logging contractors, and forest owners, who experience first hand the difficulties and opportunities for improving management. The aim was cross-fertilisation and a shared action programme to advance the state of the art of sustainable beech forest management.

Many of the 65 participants brought the potential through their own actions to contribute to improved sustainable beech forest management. Among the participants were two former Directors-General of Forests, representatives of five CRIs, two universities, three central government departments, two regional councils, three Maori authorities, four NGOs, five production beech forests, seven other businesses trading in beech including two sawmills, and 14 private consultants. The workshop was not advertised because it was intended to be small.

Workshop Development

The list of persons invited and the specific areas of focus within the workshop were developed through consultation. Fifty people identified as particularly knowledgeable, leaders in their subject areas or at the forefront of their businesses, were asked to identify the key bottlenecks to successful, genuinely sustainable, beech management. Within those broad problem areas, they were asked to name specific topics to be addressed by the workshop. These key informants represented a cross-

section of the indigenous forestry sector, ranging from environmentalists to harvesting contractors. The survey was followed by additional consultation with stakeholders including forest owners, relevant ministries such as DoC, MoF (now MAF) and MoE, and businesses dealing with beech products.

Survey responses were scored by frequency of mention of problem areas and topics and by the importance value that respondents assigned to them. The individual topics mentioned by respondents



Helen Hughes, Chair of the final plenary session, and Nora Devoe, workshop organiser, at the podium. (Photo: Karl Schasching.)

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