

SUSTAINABLE MANAGEMENT OF INDIGENOUS FORESTS IN NEW ZEALAND

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Abstract

History of New Zealand, shows how people can destroy nature for their own profit. Intense and destructive use, strong deforestation for agricultural cultivation and animal husbandry has led to the impoverishment of indigenous forest resources. At the end of the nineteenth century, in these devastated lands began to develop sustainable forest management and restoration of native forest species. For this reason, today exist a model of the full separation of the productive and protective forests. Currently in New Zealand there are approximately 50 000 ha of natural forests managed according to the guidelines of the Programme for Sustainable Management. According to the local law sustainable forest management applies to managing the native forests in a way that maintains their production capacity while maintaining the natural values and environmental sustainability. These forests should have ensured the protection of biodiversity for future generations with a constant capacity to supply timber.

Key words: sustainable forest management, indigenous forests, New Zealand.

Introduction

In accordance to the Resource Management Act 1991, which was created to promote the sustainable management of natural and physical resources, sustainable management in New Zealand is defined as: *'managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while:*

- *sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
- *safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*
- *avoiding, remedying, or mitigating any adverse effects of activities on the environment'.*

After the establishment of the above mentioned Act there was a need for the implementation of its principles. That is why in 1993 the government made the resumption of the Forest Act from 1949, matching the records to the new requirements of forest management according to sustainable development. Criteria for sustainable forest management must have reflected specific ecological and environmental conditions and therefore a number of provisions concerning the requirements of forest management of native forests in a sustainable manner were made. Private owners of these forests are required to comply with the rules set

by the new Forest Act such as: providing the revenue to protect forests from pests and predators, providing the constant regeneration of forests, restocking of its canopy and enabling the timber supply to the market.

A brief history of forestry in New Zealand

Before arrival of the first settlers, New Zealand was covered in 80% by natural, mainly conifer-broadleaf forests. The most common native species were: kauri (*Agathis australis*), rimu (*Dacrydium cupressinum*), totara (*Podocarpus totara* P. *hallii*), kahikatea (*Dacrydium dacrydioides*), miro (*Prumnopitys ferruginnea*), matai (*Prumnopitys taxifolia*), tawa (*Tawahi bachelardii*) and beech (*Nothofagus fusca*, *N. menziesii*). In current times, and after many years of restoration of indigenous woods, they occupy only about 24% of the country (data from 2009, according to NZFI F& F) (Fig. 1).

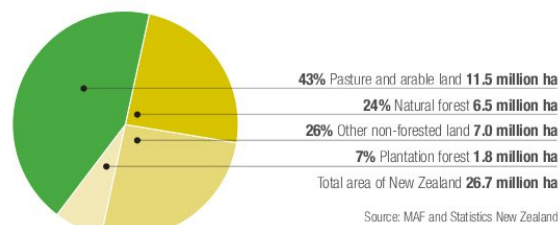


Fig. 1. New Zealand land use (by NZFI F&F 2009)

Even in the mid-19th century native forests covered around half of New Zealand. But to over the next 150 years, intensive and destructive use of natural wood resources resulted in a

reduction of the remaining forests by about half, which led to intervention by state authorities. Since 1871, the government has come to offer land on preferential terms for tree plantations, and in 1874, the first Forest Act was established [8]. A few years later the first Conference of wood was organized, on which the timber industry representatives, together with activists for environmental protection have agreed that plantation forests should be the only main source of timber in the future. Even in those days people were aware how important is protection of natural forest resources of the country. The next step in the development of forest management was the establishment the Royal Forestry Commission in 1913, which proposed to the growers several exotic species of trees under intensive cultivation. However, despite the new provisions to encourage the colonists to plant trees, deforestation of native forests have been too large and some of the native species were considered as threatened with extinction. For this reason, in 1918 the export of local timber was prohibited, and in 1925 the government introduced new financial incentives in order to create more plantations of introduced species. All these treatments had the intention to reduce the pressure on natural forests and to initiate conservation operations.

Massive plantations formed in the 20's, 30's and 60's of the twentieth century has created a solid base for the forestry industry, and soon made it possible to meet all the needs of New Zealand wood products, as well as became the basis of forest sustainable management for future generations. The forest policy changes of the late 1970s and 1980s reflected the changing and turbulent political climate and popular support for forest conservation [14]. In 1986-87 the Government of New Zealand divided forest resources between two separate entities – the Department of Conservation (responsible for the protection of native forests) and the New Zealand Forestry Corporation (responsible for the management of state-owned forests). Isolation of native forests has allowed to preserve their natural character and they to control the limitation of obtaining timber from them. The next step causing significant changes in the system of native forest management was the publication of two Acts implementing a number of principles of sustainable forest management in indigenous forests. These acts were Resource Management

Act 1991 and the most important Forests Amendment Act 1993.

Part III A of Forests Amendment Act 1993 - guidelines on sustainable management

'The purpose of this Part of this Act is to promote the sustainable forest management of indigenous forest land.'

This Act provides the topic of sustainable forest management in natural forests of New Zealand. It defines sustainable management as: *'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'*... as the management of native forests in a way that preserves their productive capacity, while maintaining the natural values and environmental sustainability. By the mid 20th century the main source of wood supply were indigenous forests, but gradually the situation began to change and exotic species (mainly *Pinus radiata*) from forest plantations slowly displaced native species. The most important native tree species allowed to harvest from indigenous forests are:

- *Nothofagus fusca* (Red Beech);
- *Nothofagus menziesii* (Silver beech);
- *Dacrydium cupressinum* (Rimu);
- *Beilschmiedia tawa* (Tawa).

and intermittently kauri, matai, totara, miro, black beech, hard beech, rewarewa, hinau and a range of other minor species. Currently the largest harvested wood is beech wood - about 90%, the rest 10% belongs to *Podocarpus* species.

Indigenous forests are at a constant capacity to supply timber and should also be under the constant protection of its biodiversity for the future generations. According to the Act in these stands only single trees or small groups of trees can be removed. Landowners have a right to obtain an economic return from their own forests, but they also have responsibility to maintain them healthy, with functioning ecosystem and appropriate balance between productive use and natural values. Timber can also be taken for personal use and to salvage dead and dying trees, and under other specific circumstances, when the forests need to be cleared. There are also some forests exempted from the Forests Act e.g. forests under the Conservation Act of 1987 [14]. Of the 6,4

million ha of indigenous forest in New Zealand, approximately 1 million hectares is privately owned and potentially available for management for timber production [6]. The Department of Conservation holds more than 4,9 million hectares of natural forest in National parks, scenic reserves, forest parks and other protection areas. A further 650,000 hectares is privately owned protected forest [10]. Fig. 2 shows the ownership and allocation of the natural forests.

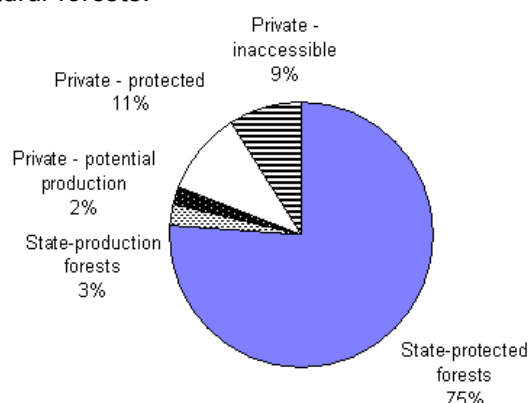


Fig. 2. Ownership and allocation of New Zealand's natural forests (source: NZMOF 1997)

Sustainable development program created on the basis of the Forest Act performs many functions, among others:

- limits export of native species only to these from sustainable managed forests (SFM);
- approves forest management plans and permits (SFM Plans and Permits) for the felling of native trees species;
- approves the annual plans for timber production from indigenous woods;
- registers sawmills for processing the raw material of native species;
- monitors compliance with the provisions of the Forests Act.

SFM Plans

They provide a long-term management of indigenous forests, for a minimum of 50 years. They must be based on a forest inventory and provide for harvests of timber on a perpetual, sustainable basis while maintaining the forest's flora, fauna, soil and water quality, natural and amenity values and protecting the forest from pests, weeds and fire [6].

SFM Permits

According to Griffiths [6] SFM Permits are

limited to a 10 year term with a maximum round-wood harvest of 250 m³ of kauri or podocarps or shade tolerant broadleaved hardwoods, and a maximum of 500 m³ of beech or light demanding hardwoods, where the harvest does not exceed 10 percent of the timber standing on the land. Permits may be also renewed after 10 years but only in stands where the forest has been replaced through growth and the quantity of timber removed under the previous permit. The timber may be harvested at any time over the 10-year term, either as a single harvest or spread over a number of years.

The average annual volume of forest land for harvesting to approval by SFM Plans (1 July 1993 to 30 June 2001) is 3300 ha and 7 000 m³ round-wood per annum. The average annual rate of approval of SFM Permits for this period is 4 900 ha per annum producing 10 600 m³ of round-wood per annum [6]. The same author made the projection for SFM plans and Permits on 2010 year (Table 1) with an average rate of about 2 m³ of round-wood per ha per annum.

Table 1. SFM Plans and Permits - projection to 30 June 2010 (according to [6])

	Area (ha)	Total volume/annum (m ³)
SFM Plans	72300	150900
SFM Permits	105700	15200
Total	178000	166100

The Government of New Zealand, environmental protection organizations, local authorities, but also representatives of science and industry are trying to help the indigenous forest owners on many levels by:

- assistance in completing applications for SFM licenses;
- assistance in developing projects and plans for harvesting under the requirements of SFM program;
- organizing meetings with practitioners, researchers and government representatives;
- technical advice;
- visiting the forests;
- assistance in the management of forests;
- publishing information brochures, books, articles, journals, etc.

The other important issue connected with indigenous forests is certification of the timber harvested from lands under sustainable management. PEFC is the Programme for the

Endorsement of Forest Certification. It is a guarantee to protecting natural resources by sourcing fibres from plantations and environmentally sustainable forests. Procedures applying for this certificate must show that in their industry no wood or fibre comes from illegal operations or controversial sources and determine the percentage of fibre which comes from certified forest operations.

Saying about the operations we should also mentioned about new solutions and logging techniques that have been used to support sustainable management in native forests. Helicopters are used to remove single trees with avoiding damage to the surrounding forest. Small mills using chainsaws are set up in the forest and they process single trees with leaving the tree stumps and crowns left behind in the forest. Timber is taken out from the forest by using small machines such as motorbikes, to minimize the damage of the other trees and mulch.

New Zealand forests can be divided into two main types - the beech forests, dominated by one indigenous species of *Nothofagus*, and the conifer-hardwood forests covered mainly by Podocarps [2]. Kauri (*Agathis australis*) and cedar species also sometimes occur, but they are usually in protected forests, national parks and other areas under protection. The Forest Research - indigenous plantation research programme has identified a range of native softwood and hardwood timber species with potential for growing in plantations or small woodlots as a long term timber supply. Species have been selected on the basis of their timber properties, growth rates, breeding potential, site tolerance and public profile [10]. Those species are mainly beech, tawa and rimu.

Conclusions

Active, sustainable management of private indigenous forests is one way of providing forest owners the means to re-invest in the forests' future. The control of pests and predators and the maintenance of forest productivity, soils, water quality, natural and amenity values are realistic prospects if the forests are financially self-sustaining [6].

Forests in New Zealand are wealth of endemic species, which in the vast majority are now strictly protected and are the national heritage of this country. However, if plantations have not been established on the basis of the introduced species, such as an extremely

effective growing *Pinus radiata*, New Zealand would not be able to meet the wood market only with native species, without risking the loss of natural character of indigenous forest. And although the protective and economic functions are performed in a completely separate types of forests, co-executive bodies of these tasks has led to the development and efficiency of implementation of sustainable management, giving future generations the assurance of the conservation of native forests in New Zealand.

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