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Promotion of wood and forest products in New Zealand
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Abstract

Over the past century, New Zealanders have successfully established a national plantation forest estate, primarily comprised of fast-growing *Pinus radiata*. Initially designed to complement the indigenous forest harvest, commercial logging from indigenous forests has now almost entirely ceased. The plantation estate consequently promotes the conservation of native forest, meets a large proportion of the domestic market for forest products (estimated at NZ\$2 billion including imports), and also generates over NZ\$3.5 billion of export revenue.

New Zealand exporters tend to promote their wood and forest products as renewable and environmentally friendly. These themes are particularly strong in the Asia-Pacific region, where New Zealand pine products are promoted as substitutes for tropical timbers obtained from non-sustainable sources. Due to international market requirements, many New Zealand producers have sought certification of their forests.

Given the nature of the domestic plantation resource and its role in conservation, there is presently no significant demand within New Zealand for certified wood and forest products. There is some concern, however, about the environmental and social integrity of the sources of the tropical hardwoods imported. With indigenous hardwoods increasingly unavailable for harvest, imports of tropical woods are set to increase, fuelling calls for certification.

Promotion of wood has not been a major issue within New Zealand except within the building industry, where wood is gradually being substituted with steel, masonry and composite products. The New Zealand timber industry has responded with User Guides and Design Manuals aimed at helping designers and builders specify and use wood. Additionally, the industry is starting to work together to address wood quality concerns.

One underlying concern about the promotion of wood and forest products in New Zealand, however, is that the industry has tended to focus on timber growth and supply rather than wood fibre consumption and demand. A variety of initiatives are now underway to shift industry focus to higher value, differentiated products and services. This strategy requires market intelligence, matching the domestic plantation forest resource to both current and impending market requirements. The emphasis in this strategy is not on educating the public about wood, but rather educating industry about the changing social, economic and environmental considerations and requirements of the public.

Key words: wood production, forest products, sustainability, marketing, market intelligence.

Introduction

New Zealand is fairly unique in having a forestry industry based almost entirely on one species. The country currently has 1.8 million hectares of commercial plantation forest, with 89.4% of this area planted in fast-growing *Pinus radiata* (radiata pine) trees which are generally harvested and replanted 23-33 years from planting. Originally planted to complement the local supply of wood products from the indigenous forest estate, the plantation resource now provides wood-based products for a large proportion of the domestic market and is a major earner of export revenue for New Zealand. This situation has facilitated the reservation of most of New Zealand's remaining indigenous forests from timber harvesting, and engendered a broad appreciation for the environmental conservation role of the nation's plantation forests.

In terms of promotion of wood and forest products, New Zealand producers tend to often emphasise the versatile, reliable, renewable and environmentally friendly qualities of the local softwood resource. These themes are particularly strong in the Asia-Pacific market, where New Zealand pine products are promoted as a substitute for tropical timbers obtained from non-sustainable sources. To reinforce these themes within international markets, many New Zealand exporters have sought, or are seeking, environmental certification for their forests.

In recent years, however, the New Zealand forest industry has become increasingly aware of the need to move beyond an emphasis on versatility and environmental management to product use and design. This requires a shift in philosophy from a production-to-product-to-consumer focus to a consumer-to-product-to-production focus. That is, the industry needs to understand current and future requirements by consumers and regulators, provide products that best match expected needs and associated performance parameters using domestic resources, and also assist in demonstrating the sound use of the various products available within the market. Recent experiences in the New Zealand building sector, with regard to weather-tightness problems, highlight the importance of the latter.

A variety of built environment research initiatives are currently underway with the aim of promoting and demonstrating the sound use of wood and forest products in New Zealand. The emphasis in these initiatives is not so much on educating the public about wood, as educating industry about a) the changing social, economic and environmental considerations and requirements in the market and b) incorporation of wood into the built environment in a manner which optimises its performance.

The Development of New Zealand's Domestic Forest Market

The past century has witnessed the establishment of a successful national plantation forest estate in New Zealand based on fast-growing softwood species such as radiata pine. This eventuated as a response to the rapid clearance of indigenous forest cover in the latter half of the nineteenth century (Fleet, 1984).

Initially extensively covered in podocarp-hardwood and beech (*Nothofagus*) forest, large tracts of New Zealand were then cleared for pastoral agriculture by European settlers. Over time, concerns began to be raised about the ability of the remaining forest to meet the future timber demands for New Zealand. Indeed, projections in the second decade of the twentieth century indicated that, if contemporary felling rates continued, no indigenous forest would remain by the year 1964. As a consequence of this projected 'timber famine,' a New Zealand Forest Service was established in 1919 with a mandate to plant as much as 320,000 hectares of land in forest to meet foreseeable local timber needs. For a number of reasons, including the experience of individual growers over the previous two decades and a simple discounted cash flow analysis, fast-growing exotic species were recommended. After a range of species trials, radiata pine was the main species planted, particularly as it proved to have high survival rates even with inexperienced planting and tending (Fleet, 1984; Horgan and Maplesden, 1995).

Restrictions on imports, the imposition of quotas and licences, and research into new uses for the wood were various methods initially used to help promote the use of locally grown pine. Prior to 1940 radiata pine was used solely for local box making and concrete forming. Sold completely ungraded, it was regarded as an inferior species to the high-quality indigenous timbers readily available. From the late 1940s the increasing quantities of timber and other wood products being produced from the newly developed plantations were acquiring a gradually expanding role in house construction and furniture production (Fleet, 1984; Horgan and Maplesden, 1995).

Throughout the next two decades the New Zealand Forest Service focussed on servicing the domestic market, educating users and consumers about the benefits of radiata pine and plantation forestry, and achieving domestic acceptance for graded sawn plantation material. Consequently, by the 1960s plantation grown timber was meeting most of New Zealand's sawn timber needs, especially for construction. A second phase of mass planting then began as the Government sought to diversify New Zealand's resource-base for generation of export revenue (Horgan and Maplesden, 1995).

From the mid-1980s the New Zealand economy has been radically restructured, deregulated and privatised. Restructuring within the private sector ended a policy of providing cheap wood for local processing, whereby sawmills were allocated logs at prices well below their export value. Removal of market subsidies and protection consequently resulted in the domestic market becoming more susceptible to international market fluctuations, with log export prices influencing domestic prices. In 1985 the New Zealand Forest Service was also dissolved and the State forests (excluding the land) subsequently sold to private companies, including many foreign-owned multi-national forestry companies. These various economic reforms have engendered a more commercial attitude within forestry companies, with more emphasis on markets and profitability (Maplesden, 1997).

The area of plantation forest in New Zealand continues to increase. New Zealand has 1.8 million hectares of plantation forests as of March 2002, representing 7% of the total land area of the country. Of this estate, 89.4% of the area is planted in radiata pine. Wood availability is currently 18.5 million m³ per annum, with this set to rapidly rise to over 30 million m³ over the next decade (New Zealand Forest Owners Association, 2002). New Zealand's radiata pine is generally regarded as a tree with fast growth rates (reaching an average height of 35 metres after 30 years), medium density wood, even texture and average shrinkage for softwoods. It is relatively easy to dry, easy to machine and accepts finishes well. Though not naturally durable, it is very permeable to preservatives. The New Zealand timber industry has capitalised on these features over the past decades, extending the use of radiata pine to exterior uses, moulding and millwork, furniture, joinery, finger-jointed, laminated and kiln dried products and hardened wood. Efforts continue to push this versatility further. The domestic manufacturing and re-manufacturing base remains small however, due to limited domestic economies of scale and little emphasis, until the past decade, on exporting higher value products.

Within the New Zealand market there is a tradition of wooden houses, developed in part to the availability and cost of timber, plus the knowledge that such houses are more resistant to earthquake damage. New Zealand consequently has a relatively high annual per capita consumption of roundwood. With a population of only 4 million and a slow rate of population growth however, local wood consumption remains relatively static at about 6-7 million m³ of wood per annum (including imports); the approximate annual consumption of domestic wood by product type is shown in Table 1. The construction industry is the principle user of solid wood products in New Zealand, servicing about 20,000 new house starts annually.

Table 1: Domestic Wood Consumption by Product Type (Forestry Insights, 2001)

Product Type	Approximate Annual Consumption
Sawn Lumber	2,000,000 m ³
Reconstituted wood panels	340,000 m ³
Plywood	40,000 m ³
Newsprint	110,000 m ³
Paper and Paperboard	600,000 tonnes
Total domestic consumption	3,100,000 m³

While New Zealand's plantation forest industry evolved, pressure for the preservation of the nation's remaining indigenous forest cover also increased. In 1991 an agreement was reached between conservation groups and all major plantation growers and users, entitled the New Zealand Forest Accord. This Accord acknowledged that existing natural forests should be maintained, recognised commercial forests as essential for this, stated that any harvesting from indigenous forests must be on a sustainable basis, and insisted that new plantation forests will not disturb areas of natural forest (New Zealand Forest Owners Association, 2002). The 6.4 million hectares of indigenous forest remaining, representing 24% of New Zealand's total land area, is now largely reserved, with less than 2% of the national timber harvest being indigenous in origin. New Zealand's commercial production of forest products is now reliant on privately owned plantation forests and on one species (although radiata pine forms only about 50% of new plantings).

The existence of a fast growing, versatile and reliable softwood resource that met a large proportion of domestic requirements meant that the plantation forest estate, originally

intended as a compliment to indigenous timber supply, has provided a viable and acceptable substitute. New Zealanders have consequently acquired a fairly strong understanding of the role and benefits of plantation forests in the national economy and society. The resource is seen as enabling the preservation of the indigenous forest estate, the source of a large proportion of the forest products required by the domestic market (estimated at NZ\$2 billion including imports), and the third largest export earner (estimated at over NZ\$3.6 billion).

The Development of New Zealand's Export Markets

New Zealand's exports of forest products are small in terms of total global output. New Zealand has just 0.05% of the world's forest resource and supplies only 1.1% of world forest products trade. It supplies 8.8% of Asia-Pacific's forest products trade, but this market is concerned largely on the supply of low value products. Overall New Zealand's export product mix remains largely commodity based, with logs, sawn timber and pulp and paper making up 75% of export value (Forestry Insights, 2001; New Zealand Forest Owners Association, 2002).

Until the 1960s exports were only a minor concern to a domestically focussed industry. New Zealand's wood products exports involved only sawn timber to Australia and logs to Japan, with this simply being viewed as a means of utilising material surplus to domestic requirements. Export marketing and market development were consequently limited and in many cases opportunistic.

From the late 1960s, when the second planting boom began, the emphasis changed. This planting was designed specifically for the establishment of an export oriented industry. There was, however, no detailed strategy in place at the time regarding markets for the trees being grown. Indeed, the question of systematic marketing was not actually addressed until the mid-1980s. Until that time, many people simply assumed that markets would naturally exist given that the world's old growth forests would be unable to continue to meet demands for clear and high-grade timber.

Given that New Zealand's domestic consumption of wood products is small and static, 70% of New Zealand's annual harvest is now exported. Export market developments therefore now play a major role in corporate strategies. New Zealand's wood exporters have largely targeted the rapidly growing markets of Asia-Pacific, which is the world's largest market for softwoods. Yet two-thirds of exports by value continue to go to only three countries: Australia, Japan and the Republic of Korea.

A well-established market for New Zealand's radiata pine exists in Australia and Japan. Australia is the most important market by value for New Zealand, accounting for almost NZ\$1 billion or 27% of New Zealand's forest products export revenue, though Australia has an expanding domestic plantation resource and a strategy for eventual self-sufficiency. Japan is the second largest market, importing NZ\$719 million of wood products in the year ended March 2002, although logs continue to account for a large percentage of the Japanese market. The Japanese market continues to have an historic perception of New Zealand pine as a low value resource (Forestry Insights, 2001; New Zealand Forest Owners Association, 2002). Promotional works do not appear to have substantially changed this perception to date.

New Zealand's wood products are also being promoted in Korea, Taiwan, China, Thailand, the United States and Europe. The United States is New Zealand's fourth largest market, importing NZ\$501 million of wood products in the year ended March 2002. A relatively new market for the New Zealand forestry industry, it has expanded rapidly in recent years, particularly in higher value products such as furniture and mouldings (Ministry of Agriculture and Forestry, 2002; New Zealand Forest Owners Association, 2002).

Nevertheless, the New Zealand Ministry of Agriculture and Forestry (2002) identifies several issues that need to be addressed by the New Zealand forestry industry. These include: a poor perception of New Zealand pine in some overseas markets; a consequent reliance on commodity products such as logs; a lack of research into higher value-added timber products; a lack of a significant international marketing presence; and a lack of a market-to-product-to-production philosophy.

International Promotion of New Zealand Pine as a Sustainable Resource

The effects of the economic reforms in New Zealand since the 1980s have been to open the economy to more international competition and engender a more commercial attitude within New Zealand businesses, as well as placing greater reliance on the market to develop strategy. All of the large forest companies, and many small ones, now invest significant effort in marketing, many having permanent representatives based in their major overseas markets (Horgan and Maplesden, 1995).

There are a number of platforms which are key to the promotion of New Zealand's radiata pine. These include that the wood is versatile and reliable, radiata pine is equivalent to other renowned softwoods in regard to performance, the plantations help preserve New Zealand's indigenous forests, the trees are fast growing, the resource is renewable, and there is industry commitment to best practice in environmental management. In 1995 various conservation groups and the major plantation growers and users signing to the Principles for Commercial Plantation Forest Management. This document aims to promote environmental excellence in plantation forest management, with all parties agreeing that management practices must meet or improve on all statutory requirements and accepted best practices (New Zealand Forest Owners Association, 2002). The renewable and environmentally friendly themes are employed strongly in the Asia-Pacific region, where New Zealand pine products are promoted as substitutes for tropical timbers obtained from non-sustainable sources (Griffiths, 2000).

Within a privatised environment, the larger industry members and independent saw-millers and solid wood processors within New Zealand tend to pursue independent market development. Several pan-industry and industry organisations, such as the New Zealand Forest Industries Council, the New Zealand Pine Manufacturers Association and the New Zealand Timber Industry Federation, in addition to the Ministry for Foreign Affairs and Trade, strive to establish co-operative marketing ventures. However, in-market promotional ventures such as Wood New Zealand Limited, which sought to set up trade offices in key new markets, have struggled for industry funding (Ausnewz Intelligence Service, 2000; Ministry of Agriculture and Forestry, 2002).

Given the strong export orientation of the New Zealand forest industry, significant effort is put into promoting trade liberalisation through the World Trade Organisation, the Asia Pacific Economic Co-operation (APEC) regional forum, and also bilateral agreements. There has been a similar push for reductions in non-tariff barriers, such as prescriptive building codes, and for New Zealand involvement in certification developments at an international level,

thereby endeavouring to avoid schemes that operate as new barriers to trade. The New Zealand Forest Industries Council has played a major role in such endeavours, with the express aim of opening more markets for New Zealand products (Ausnewz Intelligence Service, 2000).

Forest certification is seen as vital to future market development for New Zealand, demonstrating the environmental responsibility of industry to key markets such as the United States. The New Zealand government maintains an interest in certification but looks to industry to take up the challenge. Industry initiatives to date include the 1991 Forest Accord and the 1995 Principles of Commercial Forest Management in New Zealand, while a Draft National Standard for Sustainable Management of Plantation Forests in New Zealand is currently under development (Ausnewz Intelligence Service, 2000; New Zealand Forest Owners Association; 2002b). By May 2002 42% of New Zealand's plantation forest estate by area had achieved Forest Stewardship Council certification. This area includes 33% of the nation's annual harvest capability (New Zealand Forest Owners Association, 2002a). Certified wood products currently account for only about 0.5% of the international wood market, but it is argued that certification will see sustainability claims increase as an important marketing strategy (Griffiths, 2000; Legros, 2001).

Domestic Promotion of New Zealand Pine as a Sustainable Resource

There is presently no significant demand for certified wood and forest products within New Zealand itself, given the role of plantation forests in New Zealand for conservation of indigenous forest, plus the emphasis on replanting and environmental best practice within the national industry. The majority of New Zealanders perceive the plantation forests to be renewable and soundly managed (Kilvert, 1996). There is some concern, however, about the environmental and social integrity of the sources of the tropical hardwoods imported. With indigenous hardwoods increasingly unavailable for harvest, imports of tropical woods are set to increase, and this is fuelling calls for certification (Griffiths, 2000).

Product substitution and promotion of wood have also not been major industry issues to date, partly due to the expanding supply of competitively priced wood available. Historically New Zealanders have a culture of wood use, particularly in relation to house construction. Substitution generally involves one wood-based product with another, and branding and sponsorship are consequently fundamental to marketing in New Zealand. The building industry has experienced some minor substitution in recent decades, however, through steel, masonry and composite products. The New Zealand timber industry has responded with User Guides and Design Manuals aimed at helping designers and builders specify and use wood, such as for new niche markets such as multi-storey timber buildings. Additionally, the industry is starting to work together to address concerns about variable wood quality given the increasing use of performance based building standards instead of prescriptive codes stating which materials are to be used (Griffiths, 2000; Maplesden, 1997).

New Promotional Initiatives

There remains, however, a general lack of sophistication regarding understanding and meeting consumer requirements and aspirations. Except for a few excellent examples such as Gib® Living Solutions – which provides recommendations covering design, materials selection and building practices to address lifestyle issues in homes and buildings (Gib, 2003) – emphasis has tended to be on technical promotion and tactical positioning within a largely

design-build market. A variety of initiatives are now underway to shift industry focus to higher value, differentiated products and services. One initiative is a new Wood Processing Strategy developed between industry and government. This strategy includes the express aim of promoting integrated research and development to shift industry focus to higher value products, based upon a sound knowledge of market requirements realistically matched to the domestic planted forest resource (New Zealand Forest Industries Council, 2002). Such a strategy requires market and consumer intelligence.

New Zealand's Forest Research has also established Strategic Market Intelligence and Built Environment research programmes in recent years. A major focus of these projects has been the identification of key aspects of market development through scenario visualisation and future insight research, and the subsequent translation of this information into consumer needs and technological solution development using wood-based products and systems. The emphasis of this research is not on educating the public about wood, but rather educating industry about the changing social, economic and environmental considerations and utilisation requirements of the public, stimulating the development of a consumer-to-product-to-production philosophy within the forestry industry. Future insight, or third-generation foresight, research has proven to be an effective technique for achieving this aim, as the process is as important – if not more so – than actual findings. The technique engages a wide range of participants in joint learning, challenges prevailing paradigms, and recognises the results of interaction between various drivers of change (Georghiou, 2001; Bates *et al.*, 2001; Bates and Killerby, 2002; Killerby *et al.* 2003).

The need to work on promotion of wood has been increased in recent years however, given a developing weather-tightness issue, popularly termed the 'Leaky Building Crisis.' This issue has come about due to a series of developments in the 1990s that converged to create damages estimated to date to be in excess of NZ\$250 million, this being a prime example of the need to recognise how trends and drivers of change interact.

During the 1990s there were a number of fundamental changes occurring within the New Zealand building industry. First, the apprenticeship scheme for builders was removed, reducing to a degree the transfer of knowledge from older trades-people to new builders. Second, there were a number of new building materials and systems introduced with which builders were not familiar. Third, there was an increase in demand for new styles of housing, particular Mediterranean style houses with monolithic cladding systems and no eaves. Such designs were not particularly suited to New Zealand's temperate weather conditions, especially where they allowed water into ceiling and wall spaces but did not allow movement of air or drainage (Eddy, 2002; Thorpe, 2002).

Simultaneously, untreated kiln-dried timbers were permitted for house construction, with architects and builders being responsible for the sound placement of these products and regulatory authorities inspecting and approving plans and buildings. Since the late 1930s New Zealand has used preservatives on building timbers due primarily to concerns about potential insect attack. Boron treatment was used to control insects such as borer in timber destined for H1 (low hazard) applications. In the 1990s, however, the forestry industry lobbied for a change to the New Zealand Building Code in order to allow untreated kiln dried timbers to be used in buildings. Such products were perceived as more environmentally friendly, they reduced the production delays and costs associated with wood treatment and subsequent disposal of chemical waste, and they were being used successfully in Australia; borer was not eating kiln-dried timber (Eddy, 2002). Australia, however, has a much drier climate than New

Zealand. In 1996 the New Zealand Building Code was successfully changed, removing the regulatory requirement for all framing timbers to be treated, and it was estimated that untreated kiln dried timber would acquire about 5% of the domestic market. Within a few years, however, untreated kiln dried timber accounted for 45% of framing wood used in new buildings.

The result of the convergence of these various factors has been numerous complaints of leaking walls and ceilings, plus rot and decay of framing and decks in newly built houses. The building industry has taken urgent moves to address all of these problems, but a note of discord has been raised in public perception regarding the trustworthiness of wood and the timber and building industries.

The weather-tightness issue of recent years has highlighted a danger of focussing on forest growth and supply of products. Delivering quality renewable and environmentally friendly products to the market is only one half of the equation. Of equal importance is an integrated, customer-focussed approach to both product design and delivery. This requires understanding consumer requirements (current and emergent), producing the best products to meet these requirements, and ensuring that these products are delivered in systems that optimise their function and performance. Research strategies such as the Forest Research Built Environment programme aim to promote a closer working relationships between forestry and building industry research providers, product manufacturers and designers in order to help achieve this objective.

Conclusion

Over the past two centuries New Zealanders have successfully established a national plantation forest estate, with the resource generally being perceived by New Zealanders as versatile, renewable and environmentally friendly. Environmental certification is seen as a means of reinforcing these themes within international markets, while strong branding and sponsorship are seen as fundamental domestic markets. Yet market benefits can be jeopardised by a) the delivery of building products and systems that fail to meet consumer and design expectations or b) system design and use that fail to match the performance expectations of the product. A key for the promotion of the sound use of wood as a renewable and environmentally friendly resource is an integrated, customer-focussed approach to both design and delivery. The emphasis in such a strategy is not so much on educating the public about wood, but rather educating industry about the changing social, economic and environmental considerations and requirements of the public and the product, and demonstrating good practice. Recent experience in New Zealand indicates that joint research, particularly using techniques such as foresight studies, can help stimulate progress in this direction. Futures research, in collaboration with industry partners, helps identify key drivers of change and challenges current paradigms, as well as highlighting the need for innovation and leadership to achieve desirable outcomes. Such collaboration and leadership is necessary to generate valued products and regain public trust in wood within New Zealand.

References

AUSNEWZ INTELLIGENCE SERVICE 2000: Forestry in New Zealand - Can It Deliver?
Ausnewz Forest and Wood December 2000.

BATES, S., BAYNE, K. and KILLERBY, S. 2001: *Room for a view: Three visions of the future urban environment in Australasia*. Forest Research Bulletin No.224. Rotorua, New Zealand: Forest Research.

BATES, S. and KILLERBY, S. 2002: An eye to the future: a one-dimensional view of the future isn't enough. *New Zealand Forest Industries Magazine* May 2002, pp37-38

EDDY, R. 2002: "Six months in a leaky house" or framing timber - what is the standard? *New Zealand Journal of Forestry* November 2002, pp.3-5

FLEET, H. 1984: *New Zealand's Forests*. Auckland, New Zealand: Heinemann Publishers.

FORESTRY INSIGHTS 2001: *Marketing New Zealand's Forest Products*, <http://www.insights.co.nz>

GEORGHIOU, L. 2001: Third Generation Foresight - Integrating the Socio-economic Dimension. In *The Approach to and the Potential for New Technology Foresight*, The Proceedings of an International Conference on Technology Foresight held in Tokyo, Japan, March 2001 (<http://www.nistep.go.jp/achiev/ftx/eng/mat077e/html/mat077oe.html>, accessed January 2003)

GIB 2003: Gib® Living Solutions (<http://www.gib.co.nz/products/gls.asp>, accessed February 2003)

GORMAN, P.J. 1995: Future market prospects for forest products. In Hammond, D. 1995: *Forestry Handbook*. Second Edition. Christchurch, New Zealand: New Zealand Institute of Forestry.

GRIFFITHS, J. 2000: New Zealand. (http://www.corma.cl/temas_interes/temas43.htm, accessed November 2002)

HORGAN, G.P. and MAPLESDEN, F.M. 1995: The role of marketing in developing exports of plantation-grown New Zealand radiata pine. *Unasylva* 183 Vol.46, pp.29-36

KILVERT, S. 1996: Logging and Landscape Change: What Do the Public Think? In RIDDLE, A. (compiler) 1996: *Harvest Planning*. Proceedings of a Conference held in Nelson, November 1995. Rotorua: New Zealand Logging Industry Research Organisation.

KILLERBY, S., BATES, S. and BAYNE, K. 2003: Future urban forms: Three visions of the future built environment in Australasia. Paper presented at the *Urbanism Downunder Congress 2003* held in Auckland, New Zealand, March 2003.

LEGROS, G. 2001: Finding markets for New Zealand's certified wood products. *New Zealand Journal of Forestry* November 2001, pp.41-43

MAPLESDEN, F. 1997: Markets and marketing strategies for plantation grown timber: The New Zealand experience. Paper prepared for *Design Industriel, Architecture & Rhéologie du Bois*, held in Bordeaux, France, March 1997.

MINISTRY OF AGRICULTURE AND FORESTRY 2002: New Zealand Forest Sector Issues: Selling the Product. (<http://www.maf.govt.nz/forestry/publications/forestry-sector-issues/fsisellingtheproduct.htm>, accessed February 2003)

NEW ZEALAND FOREST INDUSTRIES COUNCIL 2002: Wood Processing Strategy. (http://www.nzfic.nzforestry.co.nz/wps_objectives.asp, accessed February 2003)

NEW ZEALAND FOREST OWNERS ASSOCIATION 2002a: *Forestry Facts and Figures 2002/03*. Wellington, New Zealand: New Zealand Forest Owners Association.

NEW ZEALAND FOREST OWNERS ASSOCIATION 2002b: Certification Gets Closer. *New Zealand Forestry Bulletin* Summer 2002, p.1

THORPE, T. 2002: NZIF acts over “leaky building” crisis. *New Zealand Journal of Forestry* November 2002, p.41

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