Wood quality considerations for radiata pine in international markets

Karen Bayne

Abstract

New Zealand grown radiata pine competes with other softwood species and supplier nations within the international market across a range of applications. In terms of fitness for end use, wood quality goes beyond basic wood property measures and encompasses aspects of fitness from cradle to grave, from silvicultural and extraction requirements to service in use. Radiata pine holds its own against northern hemisphere species in many applications, and the New Zealand resource is of high quality compared to other radiata pine supplies. To lift the resource out of a commodity mode into niche production of desired rather than just suitable offerings, we must begin to determine what our customers appreciate at all points in the value chain from the timber supplied. Matching of these features to wood properties and the components of the resource containing those properties to appropriate processing pathways is required.

Introduction

Radiata pine is characterised as a species that has fairly good stem form and matures within 30 years producing wood of medium density, with a light colouring and quite wide growth rings. It competes on the international market with other medium density softwoods such as spruces, other pines, Douglas fir and cypresses. As the volume of radiata pine logs that are exported increases, one could perhaps incorrectly conclude that the focus on wood properties appears a lesser marketing priority to some in the industry. Wood quality remains, however, a vital component of the competitive strengths of the New Zealand timber supply, although the definition of what constitutes 'quality' in international markets requires further investigation. This paper discusses the competitive advantage of New Zealand-grown radiata pine, and the importance of wood quality characteristics in the international marketplace. The main focus will be on solid wood properties, but fibre properties of interest to the pulp and paper industry will also be briefly discussed.

What constitutes wood quality?

Traditionally, the forest sector has tended to use physical and mechanical properties to denote high quality timber. Zhang (2003) states 'many forest scientists appear to consider wood density and fibre length as the key wood quality characteristics regardless

Radiata pine logs are peeled down to a small core by Chinese plywood manufacturers. Source: Courtesy of Michael Jack of end uses.' Just as forest growers think of quality timber in terms of volume, growth and form, solid wood processors focus on strength, stiffness, stability, durability and appearance. But what does 'wood quality' mean from a customer perspective? And is it still important as a focus for research?

In answering this, it is important to account for attributes that impact on volume and grade recovery as well as ease of use throughout the value chain, not just at the end. For instance, during extraction, aspects such as piece size and weight affect harvesting costs, moisture content and log length impact on transportation, and storage timeframes can be lengthened with traits that show resistance to sapstain and discolouration. Timber mill recovery is impacted by the length, shape and form of logs. Knots and defects impact on the availability of recoverable material, and can significantly affect grade recoveries. These grade recoveries determine the mix of products that can be obtained from the resource. For structural products, grade is determined from strength, stiffness and stability properties, while appearance grades require straight, stable timber with minimal defects.

The end users of the wood products themselves may think in terms of aesthetics – workability and serviceability for end use. Serviceability relates to the 'goodness of fit' characteristics of the product in use, i.e. how well a particular attribute performs throughout the lifetime of the product. Product quality attributes must therefore be long lasting, as most solid wood products are not single-use items, but relatively enduring. Changes in product quality over time – stability, appearance, chemical composition and durability – can have consequences in use.

For the construction sector, attributes such as strength and stiffness of timber (modulus of elasticity (MoE) and density are proxies) along with dimensional stability (spiral grain, microfibril angle etc) are critical components to service in use (Moore, 2012). The ability to dry and machine the timber for handling, along with treatability, gluing and nail-holding, is also a very important attribute of structural timber. Attributes such as machinability, appearance defects and low shrinkage are important for furniture manufacturing and joinery, as shown in Table 1. The most important properties that affect Kraft pulp quality are chip basic density, which impacts on tear, burst and tensile strength indices, and fibre length and wall thickness, which affects uniformity of the furnish and subsequent homogeneity of paper properties (Kibblewhite, 1984).

Comparison of radiata pine wood properties with other species

Using data from small defect-free specimens, Bier and Britton (1999) showed that many of the physical and mechanical properties of radiata pine compare favourably with those of other softwood species that have been grown in New Zealand. However, radiata pine structural timber has on average lower strength and stiffness than timber produced from European and North American species such as Scots pine, Norway spruce and Douglas fir (Moore, 2012). This timber is sold into many global markets including Australia, while structural timber from North America is sold into southeast Asian markets such as Japan and China.

A study comparing the wood properties of radiata pine with those of Scots pine from Nordic countries (Grekin, 2006) found little difference – no more or less than five per cent margin – between the two with the following exceptions:

- Radiata pine exhibited greater shock resistance, greater porosity, longer tracheid length and greater tracheid diameter
- Radiata pine had lower cell wall thickness, lower density, lower MoE and modulus of rupture (MoR), compression and shear strength, and lower shrinkage properties.

Table 1: Grades of timber used in joinery and furniture manufacture, and their requirements

#1 Clears	Needs to have excellent staining ability, accurate moisture content and low levels of internal checks for bedroom furniture manufacture Also requires very low distortion and low level of surface checking and resin streaks for joinery end use Accuracy of moisture content is essential for reveal manufacture, as are low levels of surface checks
#2 Clears	Accurate moisture content, minimal surface checks, good staining ability and absence of internal checks are needed by users of this grade, although there is not as much concern over resin pockets and distortion as for #1 clears, due to limited joinery use
Dressings grade	Presence of brownstain, the knot sizes and frequency, and surface uniformity (including lack of planer skip) are the highest determinants for users of this grade
Cuttings grade	Accuracy of moisture content, level of internal checks and finishing ability were the determinant attributes needed by users of this grade
Merch/ Box grade	Accurate moisture content and low levels of surface checking were the determinant attributes from users of these grades (mainly for furniture framing and finger joint mouldings)

Radiata pine has often been promoted as a substitute for other southern pines – *P. taeda, P. palustris* and *P. elliottii* – which has aided entry into international markets. However, a recent example shows how differences in wood properties can be used in competitive marketing by other suppliers. An American Softwoods bulletin from 2012 (American Softwoods, 2012) promotes Southern yellow pine timber as 'the strongest softwood' following Janka hardness and density testing, and therefore more suitable for flooring, furniture and joinery over other softwood species. It states Southern yellow pine had 14 per cent greater strength than its 'nearest rival' New Zealand radiata pine. However, this species provides high grade Kraft pulp furnish qualities compared to southern pines, as radiata pine furnishes are easier to refine and have higher tensile strength, and our medium and low furnishes exhibit improved formation and surface properties. In addition, a greater furnish range covered by radiata pine stocks provided a wider tear-tensile strength relationship for different market applications (Kibblewhite, 1985).

Radiata pine timber does have a competitive advantage in its excellent machining properties in comparison to alternative softwood species (NZFRI, 1988; Young 1998). In particular, radiata pine shows exceptional turning and moulding performance, and the grain structure improves sanding performance. The presence of resin canals particularly through corewood does impact on mortising, routing and boring performance. A direct comparison with Douglas fir confirmed the superior performance of radiata pine as a machining timber over both North American and New Zealand-grown Douglas fir (Scion, unpublished data). Radiata pine wood is relatively permeable and is therefore readily stainable and treatable, which allows modification for use in a wider range of end use applications where durability and gluing performance are critical. These applications include outdoor landscaping and engineered wood products for structural use.

Processing pathways for radiata pine – where do harvested logs end up?

New Zealand has increased its forest harvest in recent years, with the majority (around 65 to 70 per cent) either being exported in log form or processed into a solid form end use, as shown in Table 2. Log exports have risen significantly, but there has been little change in processing paths for the domestically processed logs into solid product over the past decade (Lee-Jones, 2014). However, domestically processed volumes have fluctuated – since 2010 sawn timber volumes have fallen from seven million cubic metres to five-and-a-half million, and plywood volumes have increased slightly over the same period. Around 70 to 75 per cent is converted to sawn timber, 10 to 11 per cent becomes veneer or plywood, a further 13 to 14 per cent is processed into fibreboard, while three to four per cent is chipped for particleboard production.

Wood pulp production has remained static over the past decade, at between 1.4 and 1.6 million air-dry tonnes per annum. This is evenly split between mechanical and chemical pulp. Paper production is around 800,000 to 900,000 tonnes per annum, but the proportion of newsprint is declining. Domestic consumption of our solid wood products has also remained static at about 800,000 cubic metres per annum and is tied to the housing market – 75 per cent of domestic use is structural timber. The current housing

Table 2: Annual production statistics for the NZ forestry sector – 2010–2013

	2010	2011	2012	2013
Harvested log input	22,574,000 m^3	26,147,000 m^3	27,453,000 m^3	29,536,000 m^3
Exported in log form	9,600,000 m^3	12,782,000 m^3	13,754,000 m^3	16,150,000 m^3
Wood chip exports	279,000 m^3	780,000 m^3	373,000 m^3	350,000 m^3
Log exports	42%	49%	50%	55%
NZ milled production	58%	51%	50%	45%

Source: FAO Facts and Figures; MPI; USDA GAIN Report 2014

Table 3: Main end uses of products made from NZ export logs and sawn timber in selected markets

Market	End uses from NZ logs	End uses from NZ sawn timber
China	Plywood and sawn timber – packaging, construction, furniture and joinery	Packaging, construction, furniture and joinery
India	Plywood and sawn timber – packaging, construction, furniture and joinery	Packaging
Korea	Plywood and sawn timber – packaging, construction	Construction, packaging and furniture
Japan	Plywood, pulp	Packaging and furniture

Source: Indufor

Interior mouldings manufactured in China from NZ radiata pine. Source: Courtesy of Michael Jack

boom has required an increase in structural grade timber, and the domestic structural market is forecast to expand through to 2018 due mainly to immigration and Auckland housing pressure, with the Christchurch rebuild also lifting demand (BCPP, 2014)

The domestic sector places an emphasis on these sawn timber properties, but what about our export customers? Where do our exports go, and what are the logs and timber finally used for? Where are the growth market opportunities for softwood timber and what are the wood property requirements of these markets? The majority of our pulp and paper exports are sent to Australia and China. New Zealand has six main non-pulp export markets: China takes around 47 per cent of the exports; Japan, South Korea and Australia together account for a further 30 per cent; and India and the United States take around five per cent each. Some of the main end uses for our log and timber exports in different export markets are given in Table 3.

China remains our major export market, with a marked increase in the volume of export logs from New Zealand and coniferous sawn timber imports from Russia and Canada into China from 2011 (World Forest Institute, unpublished data). China produces paper, panels (mainly plywood – 38 per cent of panel production was plywood in 2008), and increasingly furniture. Much of New Zealand's radiata pine has traditionally been used for industrial purposes and temporary construction, but it is increasingly being used for higher grade furniture and fitout. More affluent Chinese consumers are undertaking interior fitout, and prefer pine over poplar options.

Since 2009, China's wooden furniture production has trebled, and wood usage for furniture production is expected to grow five-fold from current volumes by 2020 (Meador et al., 2012). Most production was consumed domestically, but China is now the largest furniture exporter in the world, exporting an average 250 million pieces per annum. More than half of Chinese furniture exports go to the United States, which is also the largest market for Chinese wood flooring and plywood exports (Meador et al., 2012). It is therefore not only the Chinese consumer who is discerning the serviceability properties of our pine, but those nations importing finished wood products from Chinese producers.

Until 2001, the majority of Chinese roundwood supplied was hardwood. Constraints on hardwood supplies have changed the product mix because China's production is tied to raw material availability and its properties. China would like to manufacture more plywood, but is constrained as hardwood roundwood supplies fall. Plywood requires high quality logs of moderate diameter, but an increased supply of lower quality, cheaper logs allows better production capacities for medium density fibreboard (MDF) and particleboard. China has subsequently imported an increasing level of lower quality softwoods and expanded particleboard production.

Table 4: Comparison of physical and mechanical properties of radiata from different international producers shows the competitive advantages of NZ-grown radiata

Country	Estimated net stocked area (000 ha)	Yield	Density Kg/m³	MoE/ Stiffness MPa	MoR/ Bending strength MPa	Uses[a]
NZ	1,560[@]	23m³/ha/yr	428–510[d]	8,000–10,050[b]	17.7–27.7[b] {5th %} ~80[d]	Sawlog, pulplog, panels, posts and poles
Australia	773[a]	22m³/ha/yr	500–545*	9,100–12,000[b]	25–40[b] {5th %}	Sawlogs, pulplogs, panels, posts and poles, energy
Chile	1,500[a]	23 m³/ha/year[#&] 35 mill m³ production (2009) [#&]	450–500#	6,700–8,750[k]	50–56[i]	Pulplogs, sawlogs, veneer, energy
South Africa	57[a]	–	350–660[c]	11,050–13,700[c]	12–16 {5th %}	Sawlogs, veneer, posts and poles
Spain	280[a]	~1.5 mill m³ of sawlogs/annum[a]	425[e]	8,630–8,800^	83–85^	Sawlogs

Sources: [@]MPI; &Infor; #CMPC; ^Grupo Losan; *DAFF Queensland; !Pacific Forest; [k]Scion; [a]Mead (2013); [$]Taranaki Regional Council; [b]Walford (1993); [c]White River Sawmills RSA; [d]Kininmonth (1991); Rouco (2014); Ballieres (2012); [i]Cerda and Wolfe (2003)

China's apparent consumption of wood panels is due to the rapid increase in secondary wood processing, especially furniture manufacture for the United States market. Much of this supply is now from softwoods, and softwood plywood is used as box casing and framing in furniture manufacture. In 2003, the Chinese were producing wood flooring, wall panels and cabinetry for the United States market, and the most important factors in accepting new wood products were price and environmental issues (Tsang et al., 2005). Wood properties were also important, even for temporary construction, as all formwork was load tested. The wood flooring and furniture processors required high density and good planing properties (smooth surfaces), while mouldings manufacturers valued precision and consistency of supply (uniformity and dimensional stability) (Tsang et al., 2005).

Analysts warn that the expansion into secondary processing and furniture exports may stagnate due to rising environmental sensitivity to current mill practices from major markets, and a likely rise in the price of Chinese goods (Meador et al., 2012). China is also likely to adopt its own forest certification scheme (CFCC), which will see demand for SFI certified wood supplies (PEFC endorsed) and subsequent decreasing demand for FSC certified timber. These factors would make Chinese products less competitive unless a high standard of softwood can be supplied for furniture processors to mitigate these impacts.

Can New Zealand continue to supply a high standard of softwood in comparison to the competition? How does our radiata pine rate alongside other softwood timber on offer? What's its competitive advantage?

NZ-grown radiata pine compared to other countries

Radiata pine grows in a number of regions, with significant plantings in Australia, Spain, South Africa and Chile, as shown in Table 4. Chile is arguably New Zealand's main competitor for radiata pine products. The Chilean sector is vertically integrated; 70 per cent of radiata pine plantations are owned by two companies – Arauca and CMPC – and these two also control 72 per cent of the export market. Unlike New Zealand, most of Chilean exports are from manufactured sawn timber, with only two per cent of the radiata pine harvest exported as logs or chip (Raga, 2009). Harvested volumes are:

- 56 per cent sawlogs – for furniture and structural visual grade, pallets and packaging
- 35 per cent pulp and eight per cent to reconstituted panels – plywood and chipboard.

Silvicultural regimes in Chile target small branch diameter, improved stiffness properties and clearwood recovery.

Besides the physical and mechanical properties of our lumber, processing abilities and the in-use performance characteristics, a number of other factors provide competitive advantage for New Zealand-grown radiata pine. The radiata pine grown in our cooler, southern climate has a brighter, whiter appearance than some of the northern hemisphere pine species. This trait has been used as a marketing feature for certain key markets, and was particularly sought by Asian consumers. New Zealand has a reputation as an open and easy trading partner, with proven history as a reliable and consistent supplier of high quality radiata pine.

An extensive breeding programme has developed that has enabled selection of key performance traits and timber characteristics. A series of long-standing trials has enhanced the growth and form of our stems, from clonal propagation and increased mean annual increment (MAI) through advanced silvicultural practices and forest management. Significant research programmes have been developed to understand how best to undertake post-milling processes – drying, treating, staining etc – as well as machine knives and speeds that produce the best finishes from our timber.

In league with sawmills and growers, the industry has produced a timber that allows consumers to take advantage of the best quality properties inherent to the wood. A number of high-performance engineered products have been introduced to the marketplace – MDF, plywood, laminated veneer lumber (LVL), I-beams – which enhance the inherent properties of radiata pine and are backed up with robust product development and testing. New Zealand radiata pine is a species that the sector continues to innovate with, the latest offering being cross-laminated timber (CLT). Innovative companies have also developed products that utilise processes such as chemical and thermal modification. This has allowed radiata pine to be at the forefront of novel wood product development and perceived as an advanced species with a solid market future.

What do our customers appreciate?

Most of our radiata pine producers understand the resource very well and understand what their competitive advantages are – against both local producers and compared to international suppliers. What is less well known are the specific features the customers appreciate and value from our radiata pine resource, and what they consider differentiates it from other supply offerings. Many of the advantages of radiata pine are well known and purported in the marketplace, and amongst these are aspects already discussed such as the versatility and quality of the New Zealand resource.

Table 5: Radiata pine market advantages

Advantages purported by local producers	Advantages listed by international timber merchants
• Excellent strength makes it suitable for engineered lumber applications • Superior yield • Consistent quality; one of the world's best clearwoods • First choice species in many parts of Asia • Pallet performance comparable to Southern yellow pine – life of five years untreated • Resistance to splitting and nails well • Logs tend to be free of internal defects or growth stress • Little resin bleeding once dried • Bright, white timber • A relatively even and uniform texture • Natural and sustainable growing conditions • Consistent physical and mechanical properties due to clonal propagation • Very low extractives • Environmental stewardship of NZ forest growers • NZ's ideal soil and climate for radiata production • High amount of permeable sapwood – easy to preservative treat • Pruned for clearwood supplies • Uniform appearance with little colour variation between pieces (high staining suitability)	• Exceptional gluing performance from uniformity and high density • Good machining ability • Resistance to splitting and good nailing properties • Low shrinkage • Versatility – useful for both interior and exterior applications • Beautifully clear timber • Comes pre-primed • Low in density and fairly soft • Laminated product is specifically designed for load-bearing applications • Lumber sold pre-treated with organic solvent-based preservative (LOSP) which can be painted or stained immediately without waiting for the lumber to dry • Excellent weight:volume ratio makes for easy handling • Clear face ply sheets free of knots and defects • Reduction of material loss thanks to superior surface quality and higher precision of thickness • High bending, traction and compression resistance (ply sheet)

Builders in this country appreciate the ease of nailing of radiata pine and its lighter weight for handling. New Zealand radiata pine is favoured for use in Asian markets as a cable drum timber because the larger knot size is not a limiting factor. More recently, it has proven to be an excellent pallet timber for its shock loading ability (a function of high strength and density but lower stiffness for the grade), and also for compressive strength and being relatively hardwearing, lasting up to five years untreated. As a wooden crate, the nail-holding and lack of splitting are key advantages, along with reduced weight.

Radiata pine is promoted on certain features when re-sold to buyers in the international arena, compared to the purported advantages from local producers. The examples in Table 5 are taken from promotional literature and online producer and merchant websites.

Wood quality requirements for the future

Despite significant market advantages, radiata pine has room to improve. The versatility of radiata pine has been its major advantage, but it has often been referred to as 'the second best species for everything.' There are a number of areas where radiata pine could improve including:

Uniformity

Radiata pine is a highly variable species for a number of reasons – see other papers in the main feature of this issue. Both growers and processors would benefit from less within-and between-tree variability. Better tools for segregating based on internal characteristics are being researched.

Dimensional stability

Distortion of structural studs is known to be a limiting factor to use (Bayne et al., 1998). Although radiata pine exhibits fairly low shrinkage, New Zealand is renowned for a harsh climate and exterior uses highlight issues of instability. Fence palings, decking and treated posts are most notably prone to movement within just a few seasons' service. Ironically these end uses have high stability and low shrinkage requirements, but are usually met from the lower grade supplies. Better understanding by end-users of the core and outerwood interactions, improvements in segregation and piece selection would greatly reduce the effects from abutting flat and quarter-sawn members due to the difference in tangential and radial shrinkage.

Softness

Although it has excellent clear face properties, uniformity of colour and good sanding and staining abilities, radiata pine timber is prone to marking and easy indentation, detracting its use particularly as a flooring timber, but also in high grade furniture. Softer timbers such as cedar can remain competitive in doors and sill applications due to excellent stability and shrinkage characteristics.

Timber stiffness

New Zealand radiata pine structural lumber mostly achieves the requirements for MSG8. It is becoming difficult to provide significant quantities of higher stiffness lumber, e.g. MSG10, while rival suppliers such as Australia and Chile are able to do so. Lack of decay resistance also impacts on long-term stiffness in untreated radiata pine timber (Hedley et al., 2008).

The appearance of radiata pine

This is both a benefit and a disadvantage. The bright white clear appearance is an advantage, but radiata pine is also prone to yellowing over time if not finished to inhibit ultra-violet effects. The knotty structure, wide rings and high number of resin canals provide the perception of a more difficult timber to machine and finish, although the opposite is true. Knots are known to dull cutter knives faster, and resinous canals are thought to be prone to require more painting primer or sealer, and to telegraph through the paint as bleeding streaks or checks. Ring width is also not a good proxy for strength, but a perception remains that the wide ring width of radiata pine reduces strength and dimensional stability long term. This makes radiata pine seem unsuitable for uses where strength and stability are important, e.g. structural timber and solid doors.

Lack of natural durability

This remains an issue for outdoor uses. Although easy to chemically preserve, international acceptance of this practice wanes. Timber treated with chromated copper arsenate (CCA) is not permitted in either the European Union or North America.

The demand for wood globally is set to increase due not only to rising population, but also an increase in consumption per capita, mainly for paper products. Since 1995, global paper production has increased 59 per cent, led by packaging and tissue growth and moderate printing demand. Newsprint, however, is declining (Cohen, 2013). A greater proportion of the world's wood supply is expected from plantation species, due to growth and yield characteristics and the ability for more uniformity from a plantation regime. An expected growth in the panels market will require more sawn timber residues as input.

Globally, plantation expansion is not driven by higher demand for conventional sawn timber, but from wood energy, pulp production and higher-value biochemical conversion plants, nutriceuticals and pharmaceuticals. However, do not be fooled into thinking this will mean less emphasis is required on growing wood with excellent properties. A greater number of factors at the cellular and nano-scale appear to impact on the fibre performance in these uses (Wegner et al, 2010). Wood is a renewable resource and is set to replace certain industrial inputs, which are in decline, or no longer desirable on environmental grounds. Current wood uses are set to remain dominant – structural, appearance grade, panels and paper – and the characteristics of these and the desirable properties of each will change due to product improvements, along with the emergence of new materials and products derived from plantation softwood species.

Whereas properties such as density, microfibril angle, cellulose content and lignin content have been important for traditional wood processing, wood properties impacting cell wall structures and cellulosic properties are likely to become increasingly important. Properties purported to be important for chemical feedstocks and for deriving nano-materials from wood include high hemicellulose six sugars content, low ash content, high syringyl/lignin (S/G) ratio, uniform nano-crystalline structure and low recalcitrant cellulose (Wegner et al, 2010).

A note on meeting customer needs

In the end, even wood with excellent wood properties could fail to impress the market if suppliers will not meet the needs of the customer's customer. This is a point brought home recently in the South Korean market where supplier inability to meet customer size specifications for sawn timber saw a decrease in high quality United States imports as Korean timber importers struggled to find United States exporters willing to supply timber in non-standard sizes, the supply being met by Chile, China and Southeast Asian exporters instead (Lee and Oh, 2012).

Concluding comments

Wood quality considerations, from a market perspective, go far beyond simply assigning logs on density, stiffness and stability properties. Properties such as permeability, treatability and versatility have allowed radiata pine to become a very useful timber across a range of applications in a world with high wood demand and diminishing native timber resources. In short, New Zealand radiata pine competes across many market applications, with a very suitable timber, but properties such as stability, softness and lack of uniformity within pieces limit its international competitiveness as a commodity resource.

The challenge still facing our forest sector is to play to radiata pine's strengths by assigning each log via a holistic value chain or processing pathway concept to produce desirable, rather than suitable, products that are difficult to compete with on a global scale (Roper & Bayne, 1997). In the same manner as other primary producers, identifying and selecting stocks that match the resource to the right processing pathways, while also selecting out elite material for high-end manufacture, would enable radiata pine to advance out of the commodity resource supplier mode and into niche production. This will require methods to identify and target properties and new products that show off these traits, providing greatly enhanced returns to the sector.

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Karen Bayne is a Senior Scientist at Scion based in Christchurch. Email: karen.bayne@scionresearch.com.

Upcoming NZIF event….

NZIF Conference
NZIF 87th AGM
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NZIF Conference

Forest Policy Project 'Penultimate Conference'

To be held at Te Papa, Wellington on Monday 10 August 2015

New Zealand Forest Policy – a process of forming a forestry-wide initiative to 'help ourselves' to a robust NZ Forest Policy.

The Government has stated New Zealand does not need a forest policy, preferring forestry development to be "market-led". But as NZIF has become aware, the so-called free market approach is not enabling forestry to deliver all its important social, economic and environmental benefits to New Zealand. The important economic, social, and environmental benefits derived from forests are not being optimised and arguably never will reach full potential in the absence of a scientifically sound policy covering all aspects of forestry including conservation forests, social and production forestry to guide and determine decisions and responses.

Come along and discuss what you think is important for a NZ Forest Policy.

New Zealand Institute of Forestry
– Te Pūtahi Ngāherehere o Aotearoa Incorporated –