

Challenges in the southern US forest industry and comparisons with New Zealand

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Abstract

New Zealand and the southern United States have similar wood supply systems in many ways. Each has been affected over the past couple of decades by changes in forest ownership, markets for products, logging contractor demographics and the world energy situation.

Introduction

The forest industry of New Zealand and the southern US are alike in several ways. They both have a reliance on plantation pine forests for the much of their raw material base, an innovative spirit that tries to remain competitive, and private ownership of forest land and harvest contracting businesses. Beyond these similarities, there are some main differences.

New Zealand relies more heavily on export markets for finished products, logs and chips while the southern US has a larger domestic market to supply during normal economic times. Terrain and tree size pose much larger problems in New Zealand and their level of mechanisation reflects this. The southern US harvests over 95 per cent of its pine with fully mechanised systems on flatter terrain with tree diameters that are generally less than 40 cm.

Finally, log sorts are far more numerous, up to 15 or 20 on New Zealand operations due to their reliance on log exports. The US operations rarely see more than 10 sorts given their transportation of tree length stems to wood mills.

There is a range of problems that each country is dealing with in today's market place and global economy. I will highlight and discuss four where their challenges are somewhat similar or interconnected.

Forest ownership

Since 1981, ownership of forest land by publicly traded, vertically integrated forest products companies in the southern US has disappeared. Instead companies have opted to divest lands by asset sales, with most lands purchased by institutional investors who use timberland investment management organisations to handle management. Alternatively they created real estate investment trusts to hold their lands to avoid double taxation of earnings under the US tax code. Either approach separates the ownership of the land from the operation of mills which convert timber to products and forces relationships between the two activities to be handled by formal contracts.

The scale of the changes has been dramatic in both countries. In the US in 1981, the top 10 owners of forest land collectively held 15 million hectares and were all publicly traded forest products

Top ten corporate owners of forest land in the United States, 1981 and 2011 in millions of hectares

Position	1981 Company	Millions of hectares	Position	2011 Company	Millions of hectares
1	International Paper	2.8	1	Plum Creek Timber Co (Real estate investment trust)	2.7
2	Weyerhaeuser	2.4	2	Weyerhaeuser (Real estate investment trust)	2.3
3	Georgia-Pacific	1.9	3	Rayonier (Real estate investment trust)	0.9
4	St Regis Paper	1.3	4	Sierra Pacific	0.7
5	Champion International	1.2	5	Potlatch (Real estate investment trust)	0.6
6	Boise Cascade	1.2	6	J D Irving	0.5
7	Scott Paper	1.1	7	Green Diamond	0.3
8	Great Northern Nekoosa	1.1	8	MeadWestvaco	0.3
9	Bowater	1.1	9	J M Huber	0.3
10	Crown Zellerbach	0.9	10	Roseburg Forest Products	0.2
	Total	15.0		Total	8.8

companies operating as traditional 'C' corporations where both corporate earnings and the dividends distributed to shareholders were subject to income taxation. By 2011, the top ten owners held only 8.8 million hectares between them, half were privately held, and of the five remaining publicly owned entities, four of them were real estate investment trusts. By contrast, the top 10 timberland investment management organisations in 2011 together held 8.3 million hectares which accounts for the bulk of the remaining land held by the corporate owners 30 years ago.

This change in ownership has been accompanied by a clear change in objective of the owners. A corporate owner with both lands and mills in 1981 often thought of the lands as an insurance policy for the mill wood supply and had, as their primary objective, landing wood at the mill at as low a cost as possible. Today, with lands divested from mill owners in most examples, the more common management approach is to maximise the financial returns per hectare to the forest owner. While this is a rational approach and perhaps obvious, this change has effects which carry over to harvesting contractors and the relationships with their clients.

Contractors

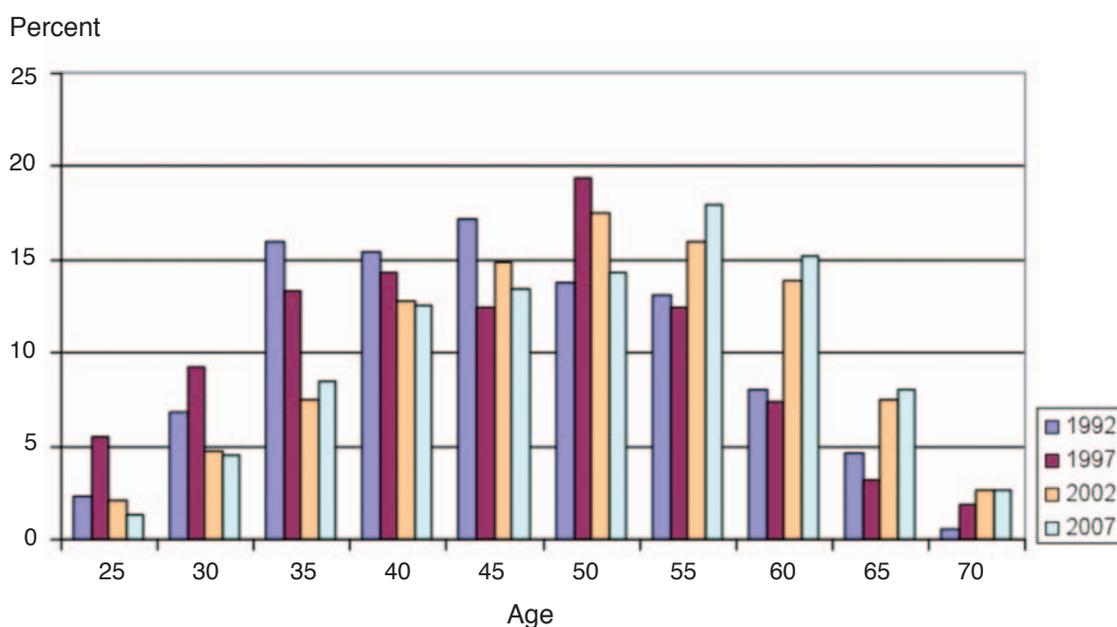
This change in land ownership and management focus, combined with sharply higher prices for pine saw timber in the 1990s, led to greater product sorting by harvesting contractors in the woods in the southern US. Where two or three sorts of pine were common in the 1980s from a clear fell of a planted pine stand, by the mid to late 1990s as many as six or seven sorts of pine were often observed.

The level of sorting is strongly tied to the strength of the timber market and has declined in the past five years with the US recession and the significant decline in housing starts. However, this move to greater sorting is indicative of the clear focus of the forest owners on returns per hectare. While for years contract loggers worked exclusively for those purchasing wood, today a small but growing number are working directly for the sellers of wood or the owners of forest land.

Independent contractors who operate one or more crews year round handle timber harvesting in the southern US. The University of Georgia has tracked changes in the harvesting contractor force since 1987 through a survey conducted every five years. Over the past 25 years they have observed the owner age of harvesting businesses to be increasing. Between 1992 and 2007, the average age of the business owners increased from 45 to 55.

Perhaps of more concern are the tails of the age distribution seen in the graph. The percentage of owners under the age of 35 is clearly in decline, while the proportion aged 65 or older has increased sharply. Life expectancies are increasing, and the overall US population is aging as well, but these trends are causing some concerns among wood-using industries as they contemplate the future of their contractor-based wood supply systems. Attracting new ownership of any age into the harvesting business is challenging given its capital requirements and the variability of production in traditional wood markets.

Other trends, which the University of Georgia logging contractor survey continues to find, include



Change in the age distribution of owners of forest harvesting businesses in the state of Georgia from 1992 to 2007

a move towards businesses operating multiple logging crews, higher capital requirements, and an increasing average production per unit of labour employed. Currently a typical crew in the region produces about 1,500 tonnes of wood each week with four people working in the woods all on machines. This translates to a productivity of around 9 to 10 tonnes per man-hour.

The number of logging businesses has continued to decline while the overall capacity of this sector has remained relatively constant. Many question if this is still the case after the volatility of the past five years from 2007 to 2012. We are currently conducting the survey again and should know soon.

The recent recession saw timber production in the southern US drop by roughly 40 to 50 per cent and this rippled into sharp declines in production targets for logging contractors. Added to this were the repeated spikes and declines in the cost of diesel and other petroleum products. While some mills were able to offer rate adjustments to help offset the effect of higher diesel prices, many had no operating margin themselves and were also facing higher freight charges for their finished products. Many logging businesses were unable to endure the reduced production and sharply higher fuel prices and were forced to close their doors. When markets strengthen in the future, it is an open question as to how many of these can return or will desire to do so to help harvest wood in the future.

Markets

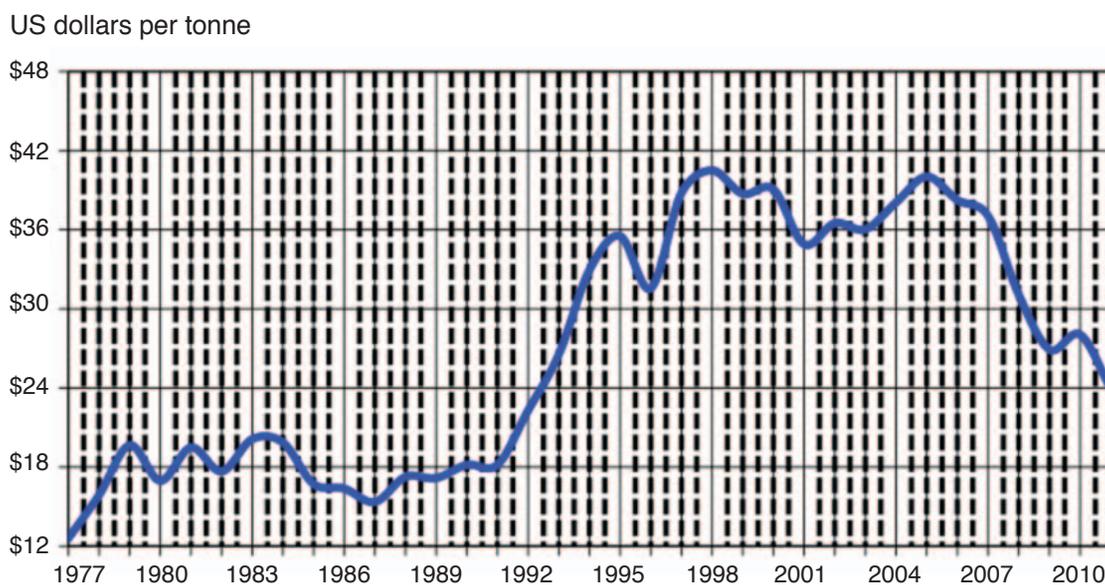
Pulp and paper has traditionally been the primary product of wood markets in the southern US,

especially in the south eastern states. In 1987, there were more than 100 major pulp mills in the region producing about 45 million tonnes of pulp a year. Overall capacity today is essentially the same but is produced by about 80 mills. Older mills which were less efficient, or were found to be in uncompetitive wood basins, have closed while newer mills in better locations have been expanded.

But the largest change in markets in the southern US over the past 30 years has probably been the sharp increase in timber production from the region. This was sparked mainly by the calamitous drop in federal timber harvest in the Pacific Northwest due to the listing of the northern spotted owl as a threatened species in 1989. Since then, timber production in the southern region increased dramatically, with corresponding increases in the prices paid to landowners for standing pine sawtimber.

All of this abruptly changed with the correction in the housing market in 2007. Average southern pine timber prices are currently in the range US\$24 a tonne compared to \$40 or higher before the recession, a drop of 40 per cent off their highs. The greater reliance on timber appears to be making this recession more painful for the southern forest industry than those previously experienced.

Landowners have responded to these dramatically lower pine saw timber prices by understandably withholding saw timber from the marketplace in expectation of higher prices in the future. Reduced timber production caused a direct reduction in pulp chips produced from sawmill residues. Therefore demand for round pulpwood



Average price across the southern US for standing pine saw timber paid to forest owners between 1977 and 2011

increased to offset the shortfall. This led many landowners to increase their thinnings in an attempt to generate cash flow while avoiding the need to put clear felling, which produces saw timber, on the market. However, without final harvest clear felling operations, we also do not have sites to regenerate to add to the younger age classes. Tree planting is at a 35-year low today due in part to this effect and the uncertainty of future markets to many landowners.

We are approaching over five years of this market condition in a region with rotations of 25 to 30 years, and an age class imbalance of some significance for the future is starting to take clear shape. In addition, so much pine saw timber is on the sidelines awaiting higher prices that it is likely to keep prices from appearing at levels fondly remembered by landowners.

Energy

Spikes in the prices of fossil fuels over the past few years caused misery for diesel consumers in the forest products industry. They also spurred an intense interest in the potential use of wood and woody biomass for energy applications. This interest was further fuelled by government support of research and development efforts to commercialise such applications and by the expectation that the US Congress would adopt policies to mandate or provide incentives for greater use of non-carbon fuels.

Wood can be used to produce electricity, heat and steam for industrial use, or for liquid fuels. However, the largest growth sector in wood energy in the southern US today however is the production of wood pellets for electric power plants in the European Union. Countries such as Germany and the United Kingdom have set aggressive renewable energy targets for their electricity sectors and are unable to source enough wood or other biomass domestically. The southern US has a large, sustainable resource basis which is strategically located for European Union ports. More than 12 wood pellet plants are operating or under construction in the southern US, with production destined for export to Europe for such uses. The largest of these plants consumes over 1.2 million tonnes of wood annually and it is all delivered in tree-length round form identical to pine pulpwood delivered to US pulp mills.

Using the residues

Forest residues are often discussed as an option for sourcing wood energy facilities, but the actual use of this resource faces some difficult realities. For one, they are residues, meaning that a harvest must first take place with other target products in

mind. Given the current soft economy in the US, traditional harvests are not as available and this has highlighted the disadvantage to many considering wood as an energy feedstock. Residues obtained from the woods often are contaminated with soil, sand, or other components that complicate wood use as a feedstock. There are also concerns about what level of residue removal from forest sites can be accommodated while not having a negative effect on site nutrient budgets.

While the US has not adopted a federal policy mandating or supporting renewable electricity on a national scale, over 30 US states have adopted renewable portfolio standards for the generation of electricity in their jurisdictions. Nearly all of these are outside the southern US so there is little demand for wood-based electricity today within the region.

Further dampening likely increases in demand for wood for energy in the future is the current low price and widespread availability of natural gas. Natural gas prices have been as high as \$14 per million BTU within the last decade, but in early 2012 the price fell below two dollars. This dramatic drop in price for the cleanest fossil fuel, which can be obtained by opening a valve at an electric generating plant, is killing interest in wood-fired plants unless state mandates require the use of wood.

The US does have federal mandates requiring increased use of renewable liquid fuels for motor fuels. However the science and technology of producing such fuels from wood is not as far advanced as the policy directives today. Several entities are working to move wood to liquid fuel processes from the bench or pilot phase to the commercial phase, but to date none have done so successfully at a production scale. These efforts are further hobbled by the volatility of the price of petroleum and the widespread availability of ethanol produced from corn in the US. Liquid fuels as a consumer of wood appears to be a market that is a decade or more in the future from today's perspective.

Summary

Both New Zealand and the US South rely heavily on privately owned forests where the bulk of the wood harvested comes from intensively managed plantations of pine. Changes in ownership and markets are prompting a reconsideration of the management regimes in these plantations and those decisions will probably affect how these harvests are performed in the coming years.

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