

# C I N T R A F O R

**Working Paper 59**

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## **An Assessment of the Market for Softwood Clearwood Lumber Products**

**Ivan L. Eastin, Chris Lane, Tom Waggener, Roger Fight and Jamie Barbour. 1996**

### **Executive Summary**

The purpose of this project was to assess market opportunities for second-growth clearwood lumber by identifying industry segments that currently utilize clearwood lumber and determining whether alternative markets will continue to exist for clearwood lumber produced from intensively-managed forests in the Pacific Northwest. The historical lumber price data was analyzed and industry segments that have traditionally utilized clearwood lumber were surveyed.

### **Survey Results**

Of survey respondents 33% were moulding manufacturers, 14% were millwork manufacturers, 10% produced doors, 8% made windows and 23% made other products such as furniture, cabinets, crafts, paneling, stair parts, and other specialty products.

The use of individual species was often associated with specific industry segments. Approximately 81% of the ponderosa pine was used in the production of mouldings and windows. Douglas-fir was primarily utilized in the manufacture of doors (49%) and other products (29%). Southern pine was used primarily in structural products, although 15% was used for mouldings and 11% was used for doors. Approximately 87% of the radiata pine was used for the production of moulding and millwork.

The geographic location of the survey respondents was: 33% from the northeast, 26% from the Pacific Northwest, 25% from the southwest, and 16% from the southeast. On average, most of the firms that participated in the survey could be classified as small- to medium-sized. While respondents' average annual purchase of softwood lumber was reported to be 5,800,000 board feet, the median volume purchased was just 700,000 board feet. Similarly, while the median sales revenue reported by respondents was \$2.8 million, average sales revenue was more than three times that amount. Roughly 50% of the respondents reported total sales revenue of less than \$2.5 million.

Concerns regarding the ability of plantation-grown timber to substitute for old-growth lumber products may be exaggerated. The study found that the two most important lumber attributes were reliability of supply and price. The least important attributes were identified as being mechanical strength and vertical grain.

Based on a factor analysis, the original sixteen lumber attributes were reduced to four factors: timber quality, manufacturing properties, mechanical properties, and price/supply. The results of the survey suggest that many manufacturers in industry segments that have traditionally relied on clearwood lumber as a raw material input have successfully substituted lower-grade lumber (e.g., shop grade lumber), non-traditional species, and non-wood products to offset reduced supplies and price increases.

In 1989, 58% of respondents indicated that raw material substitutes had replaced 31% of the softwood lumber volume previously used in their production process, although the median volume was only 5%. By 1994 however, 83% of respondents reported that they were substituting 36% (median of 24%) of their softwood lumber with other raw materials. This is a statistically significant increase. The top three reasons that respondents indicated were important considerations in their decision to utilize a substitute product were the price of the substitute, product availability, and reliability of supply. Reduced environmental impact was reported to be the least influential attribute.

Those manufacturers who did use substitute products in their manufacturing process tended to have higher sales revenue and employed twice as many people as firms that did not use substitute products.

Approximately 60% of moulding manufacturers indicated that they used a raw material substitute for softwood lumber, while 77% of millwork manufacturers, 83% of window manufacturers, 62% of door manufacturers, and all of the structural product manufacturers reported using some raw material substitutes in their manufacturing processes.

## **Price Trends**

Analysis of prices for softwood lumber products at the producer wholesale level (based on bi-weekly spot prices) indicate that, while lumber is a semi-homogeneous product, there are important and persistent differences in value based on species and grade. The user survey results suggest that price is an important variable in the purchase decision and likewise in decisions to utilize substitute raw materials, including non-wood materials.

There is a definite structure of nominal and real (inflation-adjusted) prices in the softwood lumber market, indicating that buyers purposefully differentiate lumber on the basis of perceived attributes associated with the intended end use. Lumber grades, which seek to specify broad groups of product attributes, are imperfect. Lumber products can frequently be downgraded to lower end uses and potentially upgraded through reprocessing, for example, by removing knots to produce short clear pieces of lumber. However, price trends indicate that lumber grades are a useful basis for differentiating products and to measure how prices perform in both a relative and absolute sense over time.

Relative price analysis indicates that clearwood grades of softwood lumber command a significant premium relative to the overall market, as indexed using Douglas-fir Standard & Better 2x4's as the baseline commodity index. The aggregate softwood lumber market is sensitive to macro-economic factors linked to business cycles, particularly to residential construction. As such, considerable fluctuation in aggregate lumber prices can be expected, with the overall vector of product prices moving somewhat in tandem. Nevertheless, movements in relative prices can and do occur, leading to potential substitution between clearwood lumber grades and other, less expensive lumber grades and non-wood substitutes.

The price analysis confirmed that Shop, C & Better selects, and Moulding & Better grades of Douglas-fir, ponderosa pine, and southern pine lumber command significant relative price premiums over the common and structural softwood lumber grades. Shop grades of Douglas-fir commanded an average premium of 43% while ponderosa pine #3 Shop commanded a premium of 85% relative to the baseline commodity index. C & Better Select lumber exhibited an even larger relative premium, 125% for southern pine and 474% for ponderosa pine. Moulding and Better lumber demonstrated relative premiums of 214% for Douglas-fir and 356% for ponderosa pine. These relative price premiums were quite stable over the 1989-1995 data period, with long-term trends slightly upward with respect to the relative prices for ponderosa pine C & Better Selects and Moulding & Better grades.

Increasing relative prices, however, provide incentives for buyers to consider substitute products. While the trends estimated in this study are not strongly upward, taken together with the results of the industry survey, the producers of clearwood lumber grades should be aware of the growing potential for substitute products capable of meeting end user demand and which are price competitive. In the short-term, considerable relative price instability was evident in response to business cycles, with the consequences being that end users frequently experience rapid increases and decreases in the relative prices of clearwood lumber grades which do not reflect longer-term trends but are perceived as indicators of significant market shifts. As measured by the standard deviation of relative prices around the long-term price trend, clearwood grades of lumber typically had variations three to eight times greater than commodity structural lumber grades.

Markets respond to changes in perceived relative prices, whether generated by a change in the product's own price or from a change in the price of a competitive product. The analysis of price elasticities (own-price and cross-price) was limited by the availability of relevant price and consumption information at a disaggregated level. The review of the economic literature indicates that softwood lumber is generally price inelastic in both the short- and long-run. Given the niche nature of markets for clearwood lumber grades, it

might be expected that the demand will be somewhat more inelastic, indicating that the quantity of clearwood consumed is less responsive to relative price changes in the short-term, but also that prices will be more sensitive to structural market shifts. Timber supply shifts likely account for much of the relative price instability observed for the higher-valued clearwood lumber products.

In addition to the movements of relative prices, this study found that the price premiums paid for clearwood grades of lumber (in 1995 dollar terms) were substantial and quite stable when measured as the prevailing differences from the overall softwood lumber market. In real terms, average price premiums for #3 Shop grade lumber over the baseline product ranged from \$159/mbf for southern pine and \$166/mbf for Douglas-fir to \$280/mbf for ponderosa pine. Real price premiums for C & Better Select lumber averaged \$405/mbf for southern pine and \$1,563/mbf for ponderosa pine. Finally, real price premiums for Moulding grade lumber were \$692/mbf for southern pine and \$1,196/mbf for ponderosa pine. For all the clearwood lumber species/grades combinations with sufficient price data, the real price differences were found to increase modestly over time, with the exception of Douglas-fir Moulding and Better grade lumber, where a slight downward trend in real price difference was observed for a shorter, three-year data period. The persistence of these price differences over the 1989-95 market cycles and abnormal supply disruptions would indicate that clearwood grades of softwood lumber are effectively differentiated in the perception of end users and the price differences are not a simple result of transient market disruptions.

The analysis also determined the spread of real prices between commodity and clearwood lumber grades within individual species of lumber. Where it is possible to alter the grade yields through intensive forest management, the spread of real prices is highly relevant as more clearwood replaces lower-valued grades in the total lumber recovery volume. Real price spreads remained stable during the 1989-95 period for the clearwood grades, with slightly positive trends observed for all products with the exception of Douglas-fir Moulding & Better grade lumber.

## **Conclusions**

This study found that clearwood lumber is a differentiated product for which end users are willing to pay a substantial premium. Those respondents who utilize clearwood lumber as a raw material input in their manufacturing process indicated that they value reliability of supply, price, and price stability over timber quality. This would seem to indicate that manufacturers cannot, or will not, continue to accept higher relative prices and rapid price fluctuations. The lumber price trend data indicate that softwood lumber products are highly differentiated in terms of perceived market value, reflecting the unique attributes of specific lumber grades that are valued by end users. The price analysis supports the conclusion that price-induced substitution is an important driver behind the convergence in relative prices between the higher grade ponderosa pine lumber products and the overall softwood lumber market, but that clearwood grades of lumber have generally maintained their relative price differentials. However, the price analysis and industrial survey results suggest that, for more and more manufacturers, clearwood lumber attributes may be available from lower grade lumber products and substitute products. The survey results clearly indicate that many manufacturers are switching to substitute products to meet their raw material needs and provide price stability for their manufacturing operation.

Based on these results, lumber producers and plantation managers can better assess whether to adopt management practices that emphasize the production of clearwood lumber for high-value niche markets, or whether they might be better off focusing on the production of commodity grade products. Given the significantly different cost structure associated with each of these production strategies, the results of this study can help managers determine which strategy is the most cost effective based on the characteristics of the market segments they are serving.

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