



Hardwood Chip Market - Was 2006 a "Normal" Year?

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In the context of other recent years, 2006 turned out to be a relatively "normal" year for the U.S. hardwood chip market in terms of factors that influence supply and demand; such as prevailing weather conditions, energy price trends, and pulp and paper production. Gulf Coast hurricanes and rising energy prices drove hardwood chip and pulpwood markets in 2005, but weather was not a driving factor in 2006, and energy prices were subsiding by the second half of the year. With few local exceptions, rainfall across the South was below normal through the summer and fall (according to region-wide precipitation data from NOAA), yielding fairly normal weather conditions for timber harvesting.

The U.S. pulp and paper industry experienced modest growth in 2006, with total paper and paperboard output climbing by about 1 percent since last year as of October, according to the American Forest and Paper Association (AF&PA). The historic downturn in U.S. pulpwood receipts (16 percent decline from the 1994 peak to 2002) appears to have abated in recent years. From 2002 to 2005, U.S. pulpwood receipts (the quantity of wood received at wood pulp mills) climbed by about 3 percent, with varied gains from year to year and an average gain of about 1 percent per year, according to the Forest Resources Association. Pulp and paper commodity prices were relatively robust in 2006, with hardwood market pulp prices continuing to climb upward from their recent historic lows of 2002, according to Pulp & Paper Week. In general, hardwood chip and pulpwood market conditions in 2006 appeared more "normal" than in other recent years, and thus 2006 provided a rare opportunity to observe what happens to hardwood chip and pulpwood markets under relatively "normal" market conditions.

Hardwood Chip and Pulpwood Market Trends in 2006

As of the third quarter 2006, the main observations about hardwood chip and pulpwood market trends were that average prices paid at wood pulp mills for delivered hardwood chips increased slightly, whereas hardwood pulpwood roundwood and stumpage prices declined. Delivered prices increased modestly (by 3 percent to 11 percent) for hardwood

chips from sawmills and chip mills in the U.S. South, according to Timber Mart-South. Delivered hardwood chip prices also increased modestly in the U.S. North (International Woodfiber Report). Meanwhile, hardwood pulpwood stumpage prices across the South dropped by more than 20 percent year-over-year according to various sources, including Timber Mart-South, Forest2Market, and state reports such as Louisiana Quarterly Report of Forest Products. Hardwood stumpage prices in 2006 appeared to be receding toward price levels not seen since 2002, when pulpwood consumption was at its recent historic low point. Although chip prices were fairly stable or modestly increasing, declining stumpage prices may be a leading indicator of the near-term future direction of hardwood chip prices in the South.

Pulpwood harvesting and delivery costs continued to be impacted by lingering effects of high fuel prices, particularly diesel fuel prices, which did not recede as much as gasoline prices in the second half of 2006. However, without supply disruptions caused by major hurricanes, weather-induced impacts on pulpwood supply were largely avoided. In the seemingly "normal" market conditions of 2006, hardwood pulpwood stumpage prices in the South were falling back toward the low end of their historic range, while prices of delivered hardwood chips remained relatively stable or increased. With growth in paper and paperboard output sustained at a modest rate in 2006, the initial hypothesis might be that hardwood roundwood and pulpwood stumpage prices tend to recede under "normal" market conditions, whereas prices for delivered hardwood chips remain relatively stable, so long as they are propped up by high fuel prices.

Market Issues

An issue to consider in more detail is what endemic or long-run market drivers could cause hardwood pulpwood stumpage prices to recede by more than 20 percent under otherwise "normal" market conditions in 2006, while prices for hardwood chips from sawmills and chip mills remained relatively



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stable. Another issue is that perhaps other events made 2006 more unusual for pulpwood supply and demand than it might at first appear, leading back to the question of whether 2006 was really a "normal" year after all.

As to why hardwood pulpwood stumpage prices declined under apparently "normal" market conditions in 2006, one important long-run driver, especially in the South, is the continued expansion of pulpwood supply from southern pine plantations. Millions of acres of pine plantations were established in the 1990s, and those plantations are maturing in this decade, reaching the point where thinning and pulpwood removal are needed. Expansion of fiber supply from pine plantations in the South continues to be a supply-side driver that exerts downward pressure on pulpwood stumpage markets in general. Also, pine (or softwood fiber) may have begun displacing hardwood pulpwood in pulping and paper-making; specifically, the hardwood proportion of total pulpwood consumption at U.S. wood pulp mills has been leveling out since the 1990s.

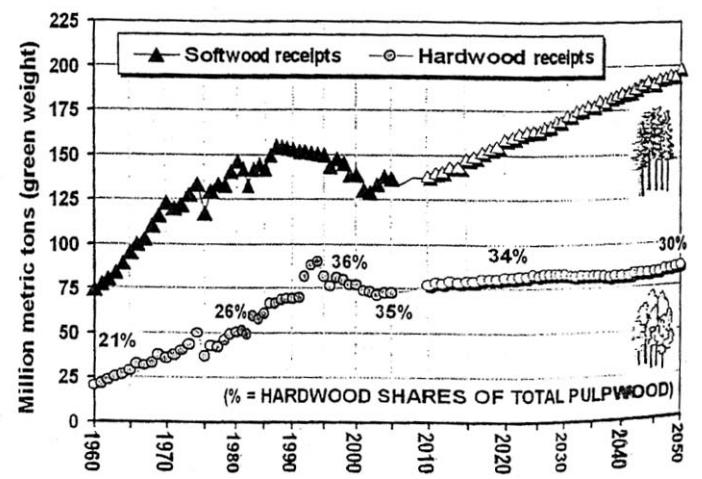
Historically, back in the early 1950s, softwoods such as pine, spruce, and other species accounted for more than 90 percent of pulpwood consumption at U.S. wood pulp mills. However, from the 1950s to the 1990s, generally lower prices for hardwood stumpage provided incentive for the pulp and paper industry to utilize increasingly more hardwood fiber. By the early 1960s, hardwood accounted for 21 percent of pulpwood receipts at U.S. wood pulp mills. By the late 1990s, the volume of hardwood pulpwood consumption had increased by more than three-fold (relative to the early 1960s) and reached 36 percent of total pulpwood receipts (Figure 1). In recent years, however, hardwood pulpwood prices have equilibrated with softwood pulpwood prices, with average hardwood pulpwood stumpage prices (dollars per cord) higher at times in 2005 than pine pulpwood stumpage in the South (Timber Mart-South). Not surprisingly, as hardwood, and softwood pulpwood prices became equilibrated over the past decade, the hardwood share of total pulpwood receipts nationwide leveled out and began to slowly recede, dipping to 35 percent by 2005.

In recent years, hardwood pulpwood prices have been firmer and generally increased more than softwood prices, although 2006 was an exception. In the previous year, pulpwood prices generally increased in the South, and the South-wide average year-over-year increase was 32 percent for hardwood pulpwood stumpage and 8 percent for pine as of third quarter 2005 (Timber Mart-South). Hardwood and softwood pulpwood stumpage prices (dollars per cord) reached equivalency

at that time. This year, as of third quarter 2006, pulpwood prices decreased in the South by 26 percent year-over-year for hardwood pulpwood stumpage and by 12 percent for softwood pulpwood stumpage, leaving hardwood just slightly cheaper than softwood.

Hardwood fiber adds unique qualities to some paper products, such as printing and writing papers that benefit from better opacity and smoothness provided by hardwood fiber. Thus, the hardwood pulpwood share of total pulpwood receipts will probably not drop precipitously and will likely remain at least 30 percent of total pulpwood supply to U.S. wood pulp mills. But it appears that the hardwood share has peaked and leveled out, influenced by the relative abundance of softwood plantation fiber currently in the market. Figure 1 shows historical trends in quantities of hardwood and softwood pulpwood receipts at U.S. wood pulp mills and recent Forest Service projections of pulpwood receipts by species group to 2050.

Figure 1 - Historical trends in hardwood and softwood pulpwood receipts at U.S. wood pulp mills, 1960 - 2004 (Forest Resources Association and Forest Service Estimates), with Forest Service projections, 2010 to 2050.



The hardwood pulpwood supply situation is clearly somewhat different than the softwood supply situation in the United States. A relative abundance of softwood timber supply has resulted from expansion in growth and output of managed softwood plantations in recent decades, notably pine plantations in the South. Future growth in pulpwood needs, projected at just less than 1 percent per year, will be satisfied primarily by expanded use of softwood fiber derived mainly from Southern pine plantations. The hardwood forest re-



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sources of the United States, by contrast, have experienced little gain in productivity and also appear to be maturing or peaking in terms of standing hardwood timber inventories. A peaking or maturing of hardwood timber inventory with little or no gain in hardwood timber productivity will likely be a constraint on growth in hardwood fiber supply and contribute to firmer hardwood pulpwood and chip prices in the long run. However, hardwood timber inventories are still increasing in the Eastern United States, where standing hardwood timber volumes exceed softwood volumes.

Other long-term factors that likely influence hardwood resource supply include shifting patterns of forest ownership, with more diversified forest landowner objectives, and gradual conversion of unmanaged forest land to housing or commercial development. Thus, fragmentation of forest ownership and changing landowner objectives are also likely contributing factors in limiting the available supply of hardwood timber and helping to maintain firm prices for hardwood chips despite limited growth in hardwood fiber demand.

In addition, a closer look at paper and paperboard output data for 2006 reveals that the modest 1 percent increase in total production of paper and paperboard was not distributed evenly across all product grades. Most of the growth was in paperboard products, which tends to utilize more softwood pulpwood, while paper products in general experienced a slight decline in output. Hardwood fiber is used more heavily in printing and writing papers and in tissue paper products, and there was not much of an increase in 2006 in net output of those paper products that heavily utilize hardwood fiber.

On the other hand, neither did these paper products see much of a decline. Thus, pulp and paper industry trends do not provide clear evidence that 2006 was anything but a fairly "normal" year for hardwood pulpwood supply and demand, with only modest deviation in hardwood pulpwood consumption at wood pulp mills relative to the previous year and an absence of major weather-related supply disruptions. For delivered hardwood chip prices, the "normal" market conditions in 2006 yielded fairly stable hardwood chip prices, as would be expected. However, hardwood pulpwood stumpage prices declined, suggesting that some other unusual force was at work influencing pulpwood markets in 2006.

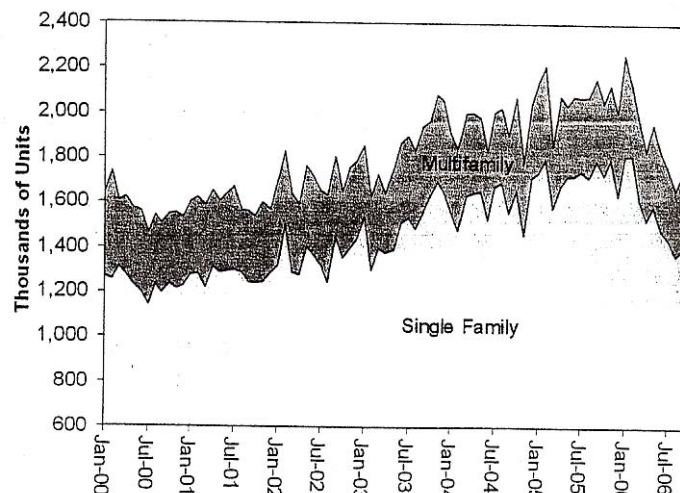
What Wasn't "Normal" about 2006?

Probably the most notable economic development affecting

wood markets in 2006 was a significant downturn in U.S. housing construction. Housing construction is normally regarded as a key driver of markets for solid-wood products, such as lumber and structural wood panels, and not so much of a driver for pulp, paper products, or pulpwood. However, the substitution of softwood fiber for hardwood in wood pulp and the emergence of solid-wood products that are based on pulpwood roundwood (such as oriented strandboard, OSB) mean that a sharp drop in housing construction can exert influence on hardwood pulpwood stumpage markets. The housing downturn was linked to a buildup of housing inventory and signaled a departure from the housing boom that prevailed in the first half of the current decade.

Figure 2 shows the trend since 2000 in U.S. housing construction as illustrated by new housing unit construction starts for both single-family and multi-family housing units. Clearly U.S. housing construction activity was booming from 2000 through 2005, but housing construction activity peaked at the end of 2005 and experienced a sharp decline in 2006.

Figure 2 - New housing units started in the United States, monthly at seasonally adjusted annual rates, for single-family and multi-family structures, January 2000 to October 2006 (U.S. Census Bureau).



Consequently, 2006 saw a fairly substantial market downturn for the OSB industry, which primarily serves the housing industry and has become a significant user of pulpwood roundwood. According to the Forest Resources Association, roundwood receipts at U.S. OSB mills were equivalent in 2004 to about 19 percent of the roundwood pulpwood receipts at U.S. pulp mills, a sizable element of pulpwood stumpage demand. OSB prices had reached historic highs



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toward the peak of the housing boom in 2004 and 2005 (Random Lengths), but OSB prices dropped precipitously along with the housing downturn in 2006. By the second half of 2006, output was being curtailed at numerous OSB mills in the United States and Canada.

In the northern tier of the United States, OSB mills typically use poplars or other low-density hardwoods, generally purchased in a form similar to hardwood roundwood pulpwood, and thus the downturn in housing and OSB output had a direct negative impact on hardwood pulpwood stumpage markets in the North. In the U.S. South, OSB mills utilize primarily southern pine. There, the housing downturn has exerted downward pressures on pine pulpwood and sawtimber markets via declines in output of OSB, softwood lumber and plywood. Downward pressure on pine pulpwood prices indirectly influenced hardwood pulpwood stumpage prices by providing incentive for substitution of hardwood by softwood at wood pulp mills.

Summary and Prognosis

Prices paid at wood pulp mills for hardwood chips were fairly stable in 2006, reflecting fairly normal fiber supply and demand conditions, moderate weather conditions, modest growth in overall paper and paperboard output, and fairly stable hardwood fiber consumption. However, hardwood pulpwood stumpage prices declined, most likely a response to the downturn in housing construction in 2006; the decline in OSB demand; abundance of pine pulpwood from maturing plantations in the U.S. South; and the propensity to substitute softwood for hardwood at pulp mills when economical or feasible to do so.

The hardwood share of total U.S. pulpwood consumption is apparently no longer increasing as it did from the 1950s to late 1990s. By mid-point of the current decade, hardwood and softwood pulpwood stumpage prices (dollars per cord) had reached parity in the U.S. South. The hardwood share of total pulpwood consumption is currently around 35 percent and is likely to gradually recede in the decades ahead. However, hardwoods are expected to remain above 30 percent of total pulpwood consumption because of inherent physical advantages of hardwood fiber in products such as printing and writing papers and tissue products.

Assuming that the recent housing downturn contributed to the recent downturn in hardwood pulpwood prices, the prognosis for hardwood chip and pulpwood markets in 2007 hinges in part on developments in the housing market. Regarding the housing market and the market outlook for OSB, softwood lumber, and plywood, much depends on whether or not the current housing downturn is brief and transitory. The downturn will likely be transitory if it stemmed mainly from a buildup of excess housing inventory that can be corrected within the next year or so by reduced housing construction activity, as some experts have suggested. Other relevant considerations for housing include trends in mortgage interest rates (still low by historical standards), foreign direct investment in agency bonds that fund home mortgages (still high by historical standards), and trends in real wage rates and overall economic activity. The chip market outlook hinges also on trends in the usual determinants, such as weather conditions, overall fiber supply and demand, and energy prices. Of broad concern is the impact of the housing slowdown on the overall economy, with slower economic growth likely to dampen growth in paper and paperboard demand, and consequently hardwood chip demand, as well.

U.S. Hardwood Chip Exports by Country- Values in Thousand Dollars

Country	January to December					January to October			
	2001	2002	2003	2004	2005		2005	2006	% Change
Canada	10,374	11,822	14,016	18,380	18,370		15,429	19,187	24.36
Italy	10,563	7,976	7,262	861	391		391	297	-24.04
Japan	125,683	45,042	9,225	13,490	9,488		5,495	9,346	70.08
Korea	11,143	4,989	7,495	8,548	12,453		8,607	7,508	-12.77
Total	163,233	75,438	45,744	45,279	47,518		36,117	38,546	6.73

Source: Dept. of Commerce, US Census Bureau, Foreign Trade Statistics

Graph: Hardwood Market Report

Ince, P.J.; 2007. Hardwood chip market-was 2006 a 'normal' year? Hardwood market report. 10th annual statistical analysis of the north American hardwood marketplace: 99-102. 2007