

Marketing Your Timber

The Basics of Weight Scaling



The concepts of cords and “thousand board feet” (MBF), Doyle log scale, are comfortable units of timber measurement in Mississippi. However, times change and so do the ways of business and industry. It has become common for forest industry companies and log buyers to purchase timber on the basis of weight, usually in tons. This development has become a source of confusion for many landowners, especially when the time comes to market their timber. The purpose of this publication is to put weight scaling into perspective and to explain the basics of weight scaling so landowners can market timber with confidence.

What Is Weight Scaling, and How Did It Develop?

Weight scaling is the practice of buying logs or stumpage on the basis of weight. The need for weight scaling developed out of the timber resource itself and the way raw material is handled in forest products manufacturing.

In the 1920s, the waning years of Mississippi’s timber boom period, the average log size was much larger than it is today. In those days, if a log wasn’t straight, defect-free, and more than 16 inches in diameter (on the small end), it was left in the woods! Complete log utilization was not an important consideration, and the labor to scale logs was relatively inexpensive in the 1920s. In that situation, scaling each individual log was appropriate and was a common practice up until about the early 1960s. As the average size of the logs being processed in mills began to get smaller, it became more time consuming and expensive for companies to pay a scaler to measure every individual log delivered to their mills. This problem was especially important to the pulp and paper industry that needed an efficient means to handle large, bulk quantities of wood and still accurately measure how much they had. In response, researchers in the late 1950s and early 1960s began to study the

relationship between volume and weight, mostly for Southern pine tree species. The pulp and paper industry in southern Georgia was the first to begin handling wood on the basis of weight. Today, the practice has spread throughout the Southeast, and pulpwood transactions by weight are the standard in the industry.

As weight scaling was tested and proved successful for handling pulpwood-sized timber, the pine lumber industry began to get interested in these methods for several reasons. First, the average size of the sawtimber being used to make lumber was getting smaller. (The average sawlog processed in Southern sawmills is about 11 inches in diameter for pine and 16 inches for hardwood.) This meant that the sawmill industry was also in need of an efficient means to handle smaller timber. Second, the trend toward mechanized logging and the transportation of wood in tree-length form, rather than in standard log form (as in the past), made weight scaling attractive to the sawmillers. Third, since many of the larger forest products companies were national or international and had operations in both paper and lumber production, there was a desire to have a standard measurement system within the company.

These logical reasons caused the larger forest products firms to sponsor research on weight scaling and to conduct their own mill studies to determine the relationships between log weights and product yields, both in pulp and paper and the sawmill industries. As a result, this started a trend in the forest products industry that continues today.

Many mills in all segments of the forest products industry are in various stages of adopting weight scaling for their timber procurement operations. This is necessary as mills become more specialized for particular products and merchandising logs among and between companies becomes more common. For example, Mill ABC purchases a 160-acre tract of mixed pine and hardwood sawtimber, but Mill ABC is a hardwood sawmill with little use for pine sawlogs in its operation. Mill ABC will sell the pine sawlogs

to the Goodpine Board Company because they use pine logs to make pine dimension lumber. Additionally, the pine and hardwood pulpwood from the tract may be sold to Excell Paper Company to be chipped for paper production. You can see how measuring all the timber by weight among all the companies would simplify business transactions and make operations more efficient and easier to monitor.

Weight scaling is not the optimal answer for every forest products company. The hardwood sawmill industry was among the last segments of the forest products industry to adopt weight scaling, and the adoption is not complete. Part of the problem is the fact that weight scaling as a measurement technique does not account well for quality, which is the heart and soul of the hardwood lumber business. Hardwood lumber producers strive to manufacture the most knot-free lumber possible, and it is difficult to measure the quality of an oak log by weight. In addition, weighing logs requires a firm to invest in truck scales and other equipment that smaller firms may be reluctant to purchase. Therefore, in Mississippi, there are many firms that handle logs on weight basis but others who, for their own particular reasons, have not. Over time however, as the forest products industry continues to evolve, more and more Mississippi forest industry firms will handle timber on a weight basis.

An Evolving Situation

The trend toward weight scaling of timber left landowners with timber buyers offering to purchase their timber on a weight basis and/or a volume basis. Loggers are also delivering timber and often being paid on a weight basis. The result can be confusion, frustration, and anger because of the perception that a standard weight is lacking.

The frustration developed into a Mississippi standard weight for pulpwood in 1983. The amendment to the Mississippi Code of 1972 (which establishes weights and measures) enacted by the State Legislature provided a standard set of weights for the forest products industry to use when determining payment for pulpwood. Conversions from volume to weight or weight to volume must be made using these standard weights per cord for pulpwood.

| Weight Conversion Table | |
|--------------------------------|--------------------------|
| Pine | 5,200 pounds or 2.6 tons |
| Soft hardwood | 5,400 pounds or 2.7 tons |
| Mixed hardwood | 5,600 pounds or 2.8 tons |
| Hard hardwood | 5,800 pounds or 2.9 tons |

Soft hardwoods include sweetgum and yellow poplar; hard hardwoods include oak and hickory. This 1983 amendment established standard weights for pulpwood, but was silent on the matter of sawtimber.

Why No Standard Sawtimber Weight?

An often-asked question is “Why isn’t there a standard set of weights for pine and hardwood sawtimber?” The short answer is because there is no weight that would be fair, but there are average weights for some species that landowners and loggers can use to help guide them in marketing timber.

There are several reasons why statutory sawtimber weights have not been set. First, trees are living organisms, and they live in different environments distributed over geographic space. This means they grow and have evolved in response to a variety of local environments over time. Therefore, even within the same species, their characteristics differ slightly across the landscape. This is called geographic variation. Trees of the same species vary in weight from one place to another. For example, the wood of loblolly and shortleaf pine in Mississippi varies in specific gravity (an indicator of weight) from northwest to southeast, with the loblolly and shortleaf pine timber in southeast Mississippi being heaviest.

A second reason that standard sawlog weight factors have not been established is that the diameter of a log affects the amount of lumber the log will yield. So, it will take more small logs than large logs to produce 1,000 board feet of lumber. Variation in log diameter causes conversion factors to be different.

Thirdly, the configuration of equipment in a sawmill will affect the yield of lumber cut from a given group of logs. That is, the same logs will yield more lumber if cut in a relatively efficient sawmill compared to an inefficient

one. Sawmillers refer to this as the lumber recovery factor of their mills. For example, a mill that uses a relatively thick-bladed circular saw to break down logs may get less lumber yield than a similar mill that uses a thin-bladed band saw for log breakdown.

A fourth reason is the log quality issue. Weight scaling does not account well for log quality. Deductions in weight or price per ton are made for defects by mills that purchase by weight, but the need for different weights for each hardwood species and other details have made a sawlog weight standard elusive.

The result of this situation is that there are no standard sawlog weights that guide the industry. Most sawmill managers keep detailed records on the type, size, and quality of the logs that go into their facilities and on the size and quality of the lumber that comes out. From these records, mill managers know the yields they can get out of their mills by using a certain “ideal log” (this is closely guarded information), and they strive to purchase that type of timber. Log prices are set accordingly. This is one

reason why landowners and loggers observe that different mills are paying different rates per ton for logs. Other reasons for varying prices might be a good supply of logs, falling lumber prices, and so on. As an example, the manager of Supapine Lumber Company may know that it takes 7 tons (14,000 pounds) of 20-inch-diameter loblolly pine logs for his mill to produce 1,000 board feet of 2 by 6 lumber. He can calculate his costs (variable and fixed) for producing and delivering that lumber. By comparing those costs with his price for lumber on the open market, he can know the most amount he can pay for logs. Another mill may have to purchase 8 tons of logs to produce the same amount of lumber.

Most sawmills in Mississippi use weight conversion factors for pine sawlogs of 8 to 10 tons of logs per 1,000 board feet of lumber. For hardwood logs (comprised mostly of red and white oaks), most mills use a conversion factor between 9 and 11 tons of logs per 1,000 board feet of lumber.

What Should Landowners Do?

Landowners who are marketing timber should not be intimidated by bids or offers that are made in weight. The buyers offering to purchase your timber have the ability to convert their offers to volume units (using their mills’ conversion rates) with which you are most comfortable. Another way to avoid the problems of conversions is to use a sealed, competitive-bid process to market your timber and to ask for lump sum bids. This way buyers are competing against one another, and their best bids are made for your timber.

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