

Resource Analysis For Crosstie Producers: A Case Study For Northern Arkansas

By J. William Griffin

INTRODUCTION

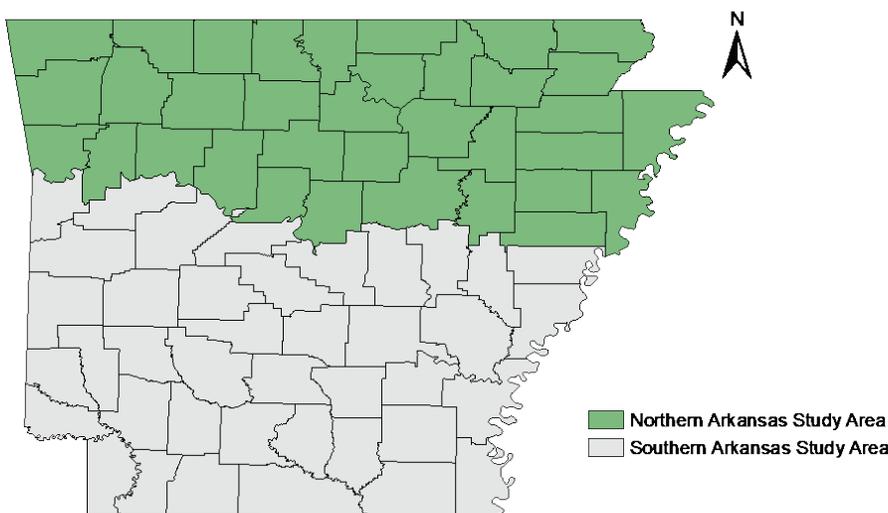
Producers of forest products in the United States are often constrained in one way or the other by the availability and quality of their raw materials. Sawmills, crosstie mills and paper mills alike must be constantly aware of the status of the resource in their procurement areas and be prepared to adapt if resources quality or availability changes in some way. This monitoring is vital to the long-term success of most facilities, and crosstie mills are no exception.

In the January/February of 2016 issue of *Crossties*¹ magazine, the United States Department of Agriculture’s (USDA) Forest Inventory and Analysis (FIA) National Program was discussed and an example of how to obtain data from their repository—EVAL-IDator. Additionally, many of the terms used by the FIA program are defined. This article is available at rta.org/crossties-magazine.

In essence, the FIA National Program is a nationwide survey of forestland conducted by the USDA’s Forest Service and state forestry agencies. The data is collected at the same sampling plots over differing intervals of time, depending on the state. The data collection at these plots is extremely specific in nature, which makes it very valuable for anyone seeking to understand more about our nation’s forest resources over time. In this series, we will explore some of these freely available data and see how they relate to crosstie producers.

The focus of this article will be threefold: 1) presentation of the currently estimated board foot volumes of crosstie-relevant species, 2) discussion of the status of timber that will one day become crosstie material, and 3) the current levels of growth and removal for crosstie feedstock. Because forest cover types and market dynamics within states can be vastly different, we will be examining portions of states in both this article and future articles. The partitioning of states will be done such that the areas closely coincide with pricing regions established by TimberMart-South²—a subscription-based

Figure 1. Map Of Arkansas Study Areas



timber price reporting agency based out of Athens, Georgia. Figure 1 highlights this edition’s study area—northern Arkansas. This 35-county study area is well known for its production of hardwood forest products.

SAWTIMBER RESOURCE CHARACTERISTICS

Table 1 includes a summary of the hardwood sawtimber resources estimated to be present in northern Arkansas according to the FIA data. Note that red oaks (*Quercus* spp.)—the primary feedstock for crossties—makes up nearly one-fourth of the standing sawtimber volume in this area. Note also that the standing sawtimber in this zone is composed of nearly three-quarters hardwood species. The International 1/4-inch scale will be used

from this point forward when referring to sawtimber. While other methods of scaling may be used, this one was chosen because it has been widely used in the past and thus provides continuity over time. Figure 1 is a map that shows the relative amount of red oak sawtimber volume present in the study area.

According to local forest products industry executives and researchers, the study area contains approximately 50 to 60 mills that purchase hardwood logs. If we conservatively assume there are 60 mills, and each mill purchases approximately 3 million board feet of logs annually, it would take the hardwood forest products industry in this part of Arkansas over 40 years to deplete the red oak timber resource alone (7,304 MMBF) ▶

Table 1. Summary of the hardwood sawtimber resources currently present in Northern Arkansas

Species	Million Board Feet ¹	Percent of Sawtimber Volume
All Red Oak	7,304	23.0%
All White Oak	8,248	26.0%
Other Merchantable ²	6,432	20.3%
Non-Merchantable	2,076	6.5%
All Hardwood Sawtimber	24,061	75.8%
All Sawtimber	31,753	100.0%

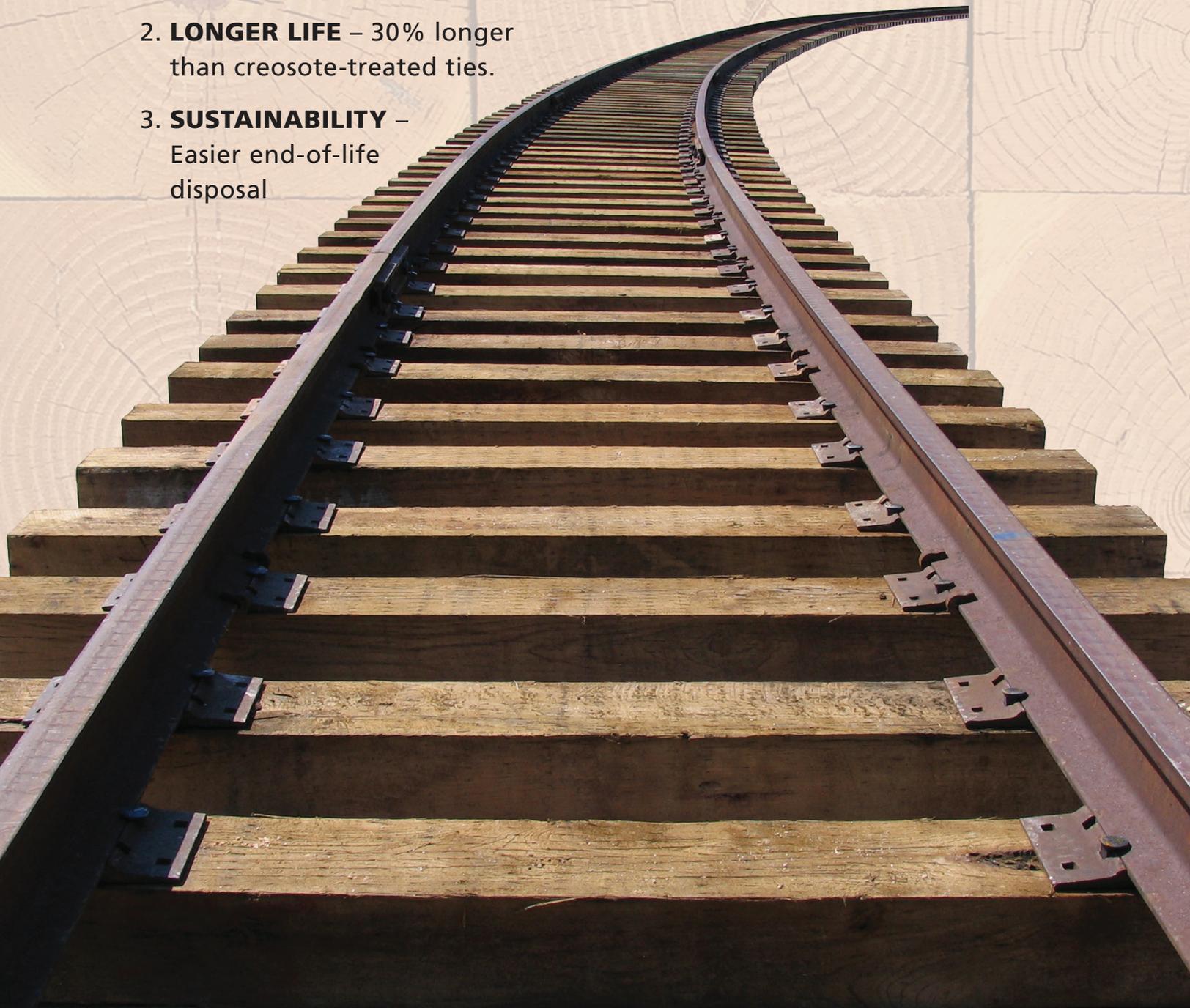
1. International 1/4-inch rule
2. Sweetgum, Hickory, Tupelo, Blackgum, Maple, Ash

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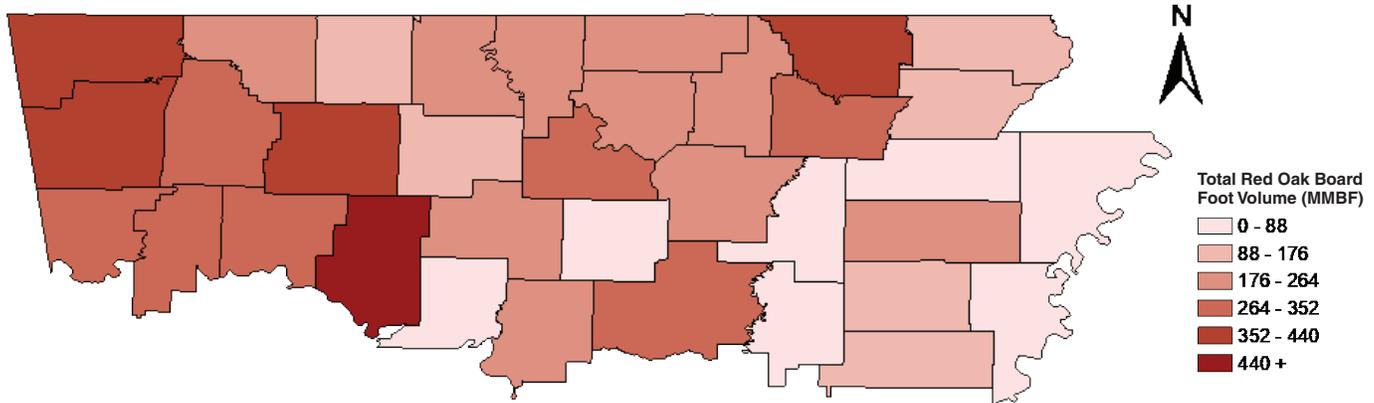
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Figure 1. Relative amounts of red oak hardwood sawtimber volume (International ¼-inch rule) estimated to be present in the study area.



of red oak volume ÷ 180 MMBF annual consumption). This example assumes that no red oak trees will grow to become crosstie logs in these forests and that these mills do not purchase logs from outside the region of focus—neither of which is realistic.

STATUS OF HARDWOOD PULPWOOD

In order to understand the future of the hardwood sawtimber resource in northern Arkansas, it is helpful to survey the current status of the pulpwood resources. Table 2 gives a summary for northern Arkansas. Note that the FIA actually defines any hardwood tree with a diameter at breast height (DBH) of 5 to 10.9 inches to be “poletimber” (5 to 8.9 inches for softwoods). This specification very closely coincides with the industry standards for pulpwood, so the terms are used interchangeably from this point forward. FIA considers any product above the poletimber class to be sawtimber. (Note: Historically, the poletimber size class referred to fence poles and posts, not utility poles, which are generally classed above sawtimber.)

An online mill location tool called the

Forest Products Locator³ and professionals familiar with the region have indicated that the only major consumers of hardwood pulpwood that are of any relevance to timberland owners in the study area are located in Pine Bluff and Crossett, Ark. Even though these two mills do purchase hardwood pulpwood from this region, it is unlikely that their consumption is causing significant effects on the long-term supply of crosstie logs. The status of the current supply is further evaluated in the following section.

GROWTH-TO-DRAIN RATIOS

Growth-to-drain is a measurement often used in forest industry planning. While somewhat of a static or “snapshot” measure, it is still useful for determining the current status of the resource’s growth compared to its removal (from timber harvests or land conversions). To calculate growth-to-drain, one simply divides the net amount (total growth minus mortality) of timber grown by the amount removed for a given geographic location—in our case, a county. This calculation can be done automatically through

the EVALIDator tool. The resulting figure can be interpreted as “net tons grown per ton removed.” A value of 1.00 means that growth is equal to removals, whereas a value above or below 1.00 indicates excessive growth relative to removals or that removals are exceeding growth, respectively. Note that the time period between which measurements are taken at the survey plots may vary among regions, which introduces error into the analysis.

Crosstie producers are chiefly concerned with red and white oak sawlog-sized material. Therefore, for our case, a special growth-to-drain ratio for each county was calculated using the removal and growth figures for all oak species. This value was specifically calculated as follows:

County Level Oak Sawtimber (ST) Growth to Drain =

All Red Oak ST Growth +
All White Oak ST Growth

All Red Oak ST Removals +
All White Oak ST Removals

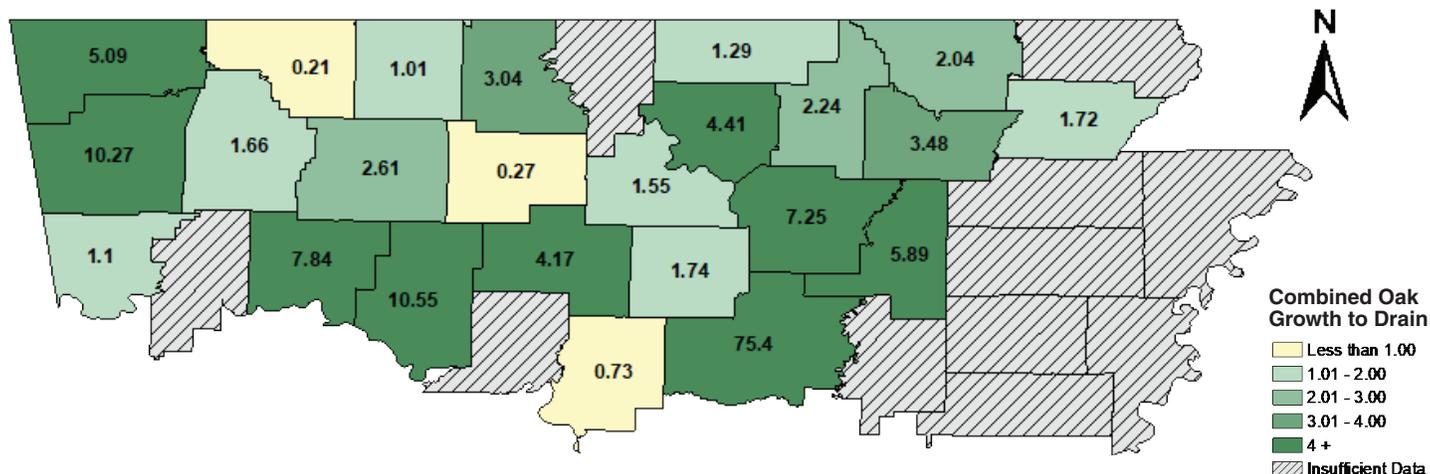
Table 2. Summary of the hardwood pulpwood resources in northern Arkansas

Species	Short Tons ¹	Percent of Total
All Red Oak	16,521,836	14.7%
All White Oak	31,834,005	28.3%
Other Merchantable ²	34,063,791	30.3%
Merchantable Subtotal	82,419,632	73.3%
Loblolly and Shortleaf	6,511,381	5.8%
Non Merchantable	23,453,907	20.9%
Total	112,384,920	100.0%

1. Green short tons as provided by FIA
2. Sweetgum, Hickory, Tupelo, Blackgum, Maple, and Ash

A value was calculable for 24 of the 35 counties in the study area. It is likely that the other 11 counties did not have oak sawtimber growth or removal values for one of two reasons. The first possible reason is that very little oak timber was present in that county and therefore very little timber was surveyed, ultimately resulting in insufficient data for analysis (e.g., counties in the Arkansas delta). The second is that growth or removals of red or white oak were not found on any of the plots in a county and

Figure 2. Combined oak sawtimber growth-to-drain ratios for Northern Arkansas



thus a growth-to-drain ratio could not be estimated. Conversely, some of the values that were actually calculated indicate that some counties in Arkansas are experiencing remarkable growth or extreme depletion of the tielog resource. For example, the analysis for White County resulted in a ratio of 75.4, and Carroll County’s value was 0.21. A growth-to-drain value of 0.21 is equivalent to a removal-to-growth value of 4.76 ($1 \div 0.21$). While it is possible that these values reflect the truth, it is more likely that these irregular values are the result of some plots in a county having excessive amounts of oak growth or removal between the two measurement periods. It is not a cause for concern for one instance, but may become a cause for concern if negative growth-to-drain is found year after year. This is one of the unfortunate realities of working with data of this nature: the amount of and distribution of the plots within a county are often a limiting factor and often may not provide a completely accurate account of the true growth and removal dynamics for a county.

Figure 2 presents the results of the oak sawtimber growth-to-drain ratio analysis for northern Arkansas. Note that of the 24 counties with a calculated growth-to-drain

ratio, 21 (87.5%) counties had a growth-to-drain ratio above 1.00—meaning they are currently growing more timber than they are removing.

A caveat must be introduced about growth-to-drain at this point. Feedback on this article from USDA suggested that making these calculations in this way at this small a sample size (county level) may not provide the most meaningful analysis for some areas. USDA analysts often only use regional data as developed for this article to increase reliability of results. The input also included thoughts that suggest that “volume tracking trends” is a better indicator of “supply” issues than growth-to-drain ratios. Future articles will attempt to address these issues in order to explore this subject matter in an improved way. Many thanks are offered to Jim Rosson and William Luppold for their input, not all of which is accounted for in this paragraph.

CONCLUSION

Overall, this type of data paints a broad picture of an area’s timber supply and may be useful for comparing the supply in different wood baskets. Northern Arkansas’ current supply of tie logs appears to be plentiful

now, and the data suggests that it will likely remain this way for the foreseeable future because of the vast amount of supply that is available and the supply that will come available (i.e. hardwood pulpwood). The growth-to-drain ratios in this study area are also largely positive, which indicates that the crosstie and hardwood sawmill industry’s presence in northern Arkansas is by no means depleting the resource faster than it can be grown. Overall, northern Arkansas appears to be in a strong position with respect to hardwood log supply, and producers there can expect this trend to continue for the foreseeable future.

It is important for the reader to understand that timber quality, tract accessibility, and timberland ownership are not accounted for in this analysis. Therefore, it cannot be assumed that the timber volumes and growth-to-drain ratios reported here are exactly indicative of the on-the-ground truth. Sources that are familiar with this type of analysis and the FIA data have suggested that volume removal trends over time are perhaps a better metric for evaluating industry demand in a region. We intend to incorporate this metric into the next installment of this series. ■

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2. TimberMart-South, <http://www.timbermart-south.com/index.html>.
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