Kentucky Forest Sector

Economic Contribution Report 2016 - 2017

University of Kentucky

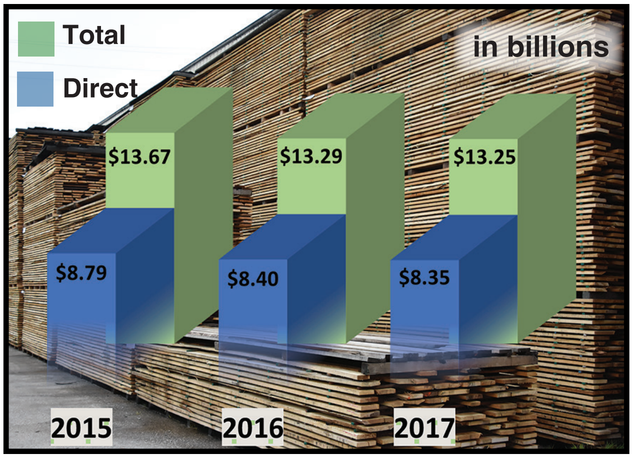
Cooperative Extension Service
College of Agriculture, Food and Environment
Forestry Extension

Annual Forest Sector Economic Contribution Estimates

Kentucky's forests cover nearly one-half of the state and provide a significant range of both economic and non-economic benefits to the Commonwealth. Utilizing a new economic contribution analysis methodology, this report estimates the economic contribution of the overall Kentucky forest sector in both rural and urban Kentucky. Since 2015, the overall Kentucky forest sector has remained stable ranging from $8.79 billion in direct contributions to an estimated $8.35 billion in 2017 (Figure 1). The total economic contribution ranged from $13.67 billion in total contributions to an estimated $13.25 billion in 2017.

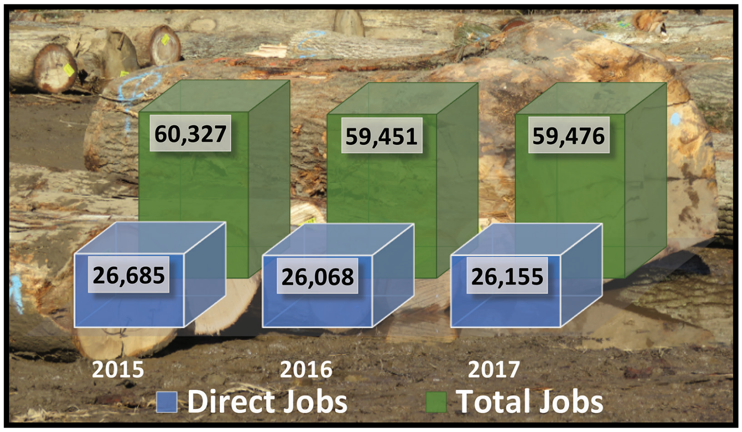
The Kentucky forest sector remains an important employer for Kentucky. Since 2015, the Kentucky forest sector has directly employed more than 26,000 people (Figure 2). On average, the Kentucky forest sector spends more than $1.5 billion annually on labor wages. Total employment attributed to the Kentucky forest sector was 60,327 in 2015 and an estimated 59,476 in 2017.

Figure 1. Kentucky Forest Sector Direct and Total Economic Contribution (2015-2017)



Figures 1 and 2 source: IMPLAN Data for Kentucky and the Kentucky Forest Products Industry Directory

Figure 2. Kentucky Forest Sector Direct and Total Jobs (2015-2017)



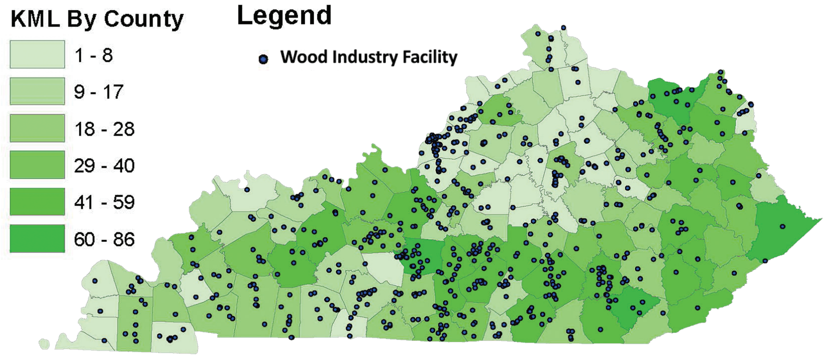
Data and Methodology

A variety of sources were used to develop this report including 2015 and 2016 IMPLAN data, the most currently available, to estimate Kentucky's direct and total forest sector economic contribution in 2016 and 2017. IMPLAN is an input-output economic modeling software and data system widely used to estimate economic contributions and impacts. Direct economic contribution refers to the economic activity directly associated with an industry sector. Total economic contribution refers to the complete economic activity associated with an industry sector and includes direct, indirect, and induced effects. The 2016 IMPLAN data was adjusted to provide 2017 estimates based on annual employment figures from the Kentucky Forest Products Industry Directory maintained by the University of Kentucky, Department of Forestry Extension and the Kentucky Division of Forestry (KDF). The availability of current employment data in the directory also allowed adjustments of other sources of information. Data from KDF through its Delivered Log and Product Prices is also essential for this report as is the Forest Inventory Analysis provided jointly by KDF and the USDA Forest Service. USDA Foreign Agricultural Service, RISI, Kentucky Master Logger Program, and Kentucky Forest Industries Association members also provided data used in this report. For more information on the report methodology please visit http://forestry.ca.uky.edu/economic-report.

2016 Forest Sector Economic Contribution Estimates

Most of the economic contribution is derived from the harvesting of timber and processing of the wood resource. Importantly, this economic contribution is generated from timber resources in all 120 counties of the Commonwealth, harvested by over 1,200 logging firms and processed at facilities located in 110 counties. Kentucky forest industries include 732 wood, paper, and paper converting manufacturing facilities across the Commonwealth (Figure 3). The distribution of these facilities, employing over 26,000 Kentuckians indicates the $13 billion contribution is an important economic force for both rural and urban communities. Employment and economic contributions for each forest sub-sector is displayed in Figures 4 and 5.

Figure 3. Kentucky Wood Industries and Master Logger Distribution 2017



Source: Kentucky Master Logger Database and Kentucky Forest Products Industry Directory

Direct Employment = 26,068
Total Employment = 59,451

Direct Contribution = $8.4 billion
Total Contribution = $13.3 billion

Figure 4. Direct Employment by Kentucky Forest Sub-Sectors

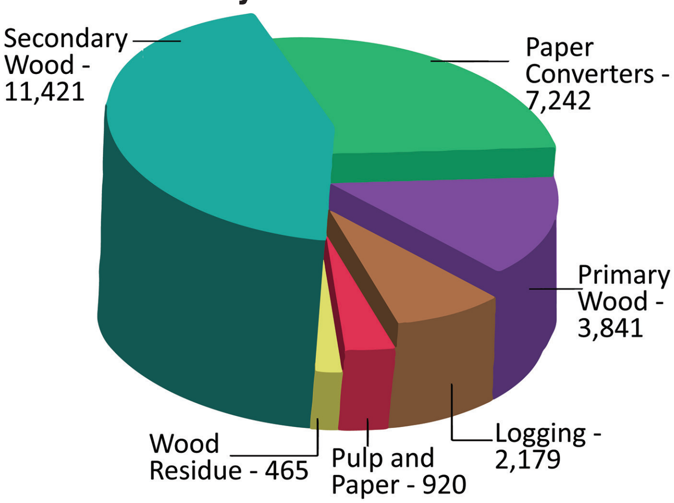
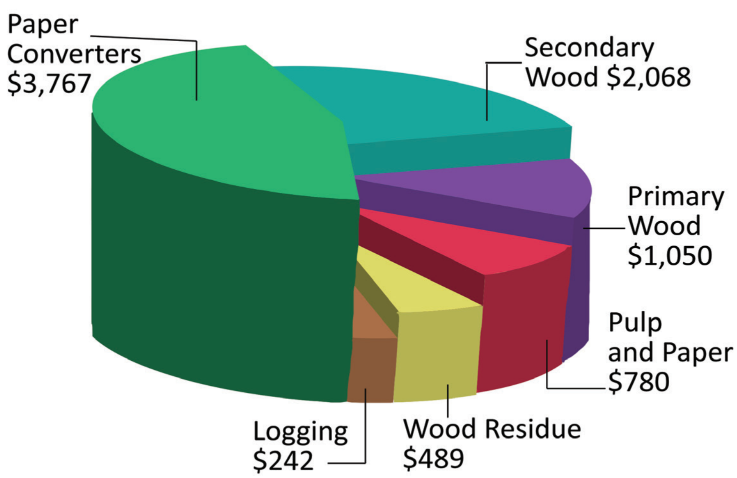


Figure 5. Direct Economic Contribution by Kentucky Forest Sub-Sectors in Millions



2017 Forest Sector Economic Contribution Estimates

Utilizing 2016 economic data along with employment and production information from Kentucky's forest sub-sectors we estimate changes in the economic contribution of the forest sector in 2017 (Table 1). While some change is expected within the forest sector we estimate that overall employment and economic contribution in 2017 will be very close to 2016 levels. The main uncertainty remains with the pulp and paper industry which we estimate to decline 15 percent in 2017 from the 2016 contribution estimates as the closing of the Verso mill in western Kentucky is projected to be fully accounted for in the 2017 data.

Figures 4,5 and Table 1 Sources: IMPLAN Data for Kentucky and the Kentucky Forest Products Industry Directory

Table 1. Kentucky Forest Sector Economic Contribution in 2017

Forest Sub-sector	Millions	% Change from 2016
Logging	$255	+5.3%
Primary Wood Mfg.	$1,106	+5.3%
Secondary Wood Mfg.	$2,081	+0.62%
Pulp and Paper	$664	-15.0%
Paper Converters	$3,767	0.0%
Wood Residue	$480	-1.84%

Timber Output and Prices

An estimated 762 million board feet of Kentucky hardwood logs were harvested in 2017, which was less than half the volume grown. However, there is an increasing concern over the sustainable supply of high quality logs of some species such as white oak used for bourbon barrels, veneer and high quality lumber. Table 2 provides delivered log prices collected by the Kentucky Division of Forestry. Prices for higher quality logs for many species remained relatively stable in 2017. However, medium and low-grade logs prices of a number of species declined, in some cases significantly, over the past year.

Stave logs are used to produce the staves that go into making barrels for the bourbon and wine industry. Stave logs come primarily from high quality white oak logs. The booming bourbon industry has helped drive the price of stave logs to over $1,300/MBF (Figure 6). This upward trend was projected and is expected to continue into the foreseeable future.

Railroad tie logs are another important timber product in Kentucky as nearly every acre contains at least some tie logs. 2017 continued a trend started in 2016 of oak tie logs performing better, averaging $403/MBF in the third quarter of 2017 with non-oak tie logs averaging $333/MBF (Figure 7).

Table 2. Kentucky Delivered Log Prices in 2017 in $/MBF and change from 2016

	Log Quality		
Species	**High**	**Medium**	**Low**
Walnut	$2,140 (30.7%)	$994 (7.4%)	$402 (-17.3%)
White Oak	$1,211 (27.42%)	$590 (-8.86%)	$314 (-23.0%)
Red Oak	$812 (4.0%)	$502 (-2.7%)	$222 (-39.0%)
Sugar Maple	$754 (0.5%)	$454 (-24.9%)	$268 (-39.4%)
Ash	$579 (7.6%)	$419 (-0.9%)	$204 (-17.0%)
Yellow-poplar	$533 (-0.23%)	$360 (-3.49%)	$190 (-30.9%)
Hickory	$434 (-6.2%)	$332 (-11.3%)	$170 (-28.2%)
Red Maple	$419 (-9.4%)	$304 (-10.6%)	$190 (-21.6%)

Figure 6. Delivered Stave Logs Prices in Kentucky 2010-2017 by Quarter ($/MBF)

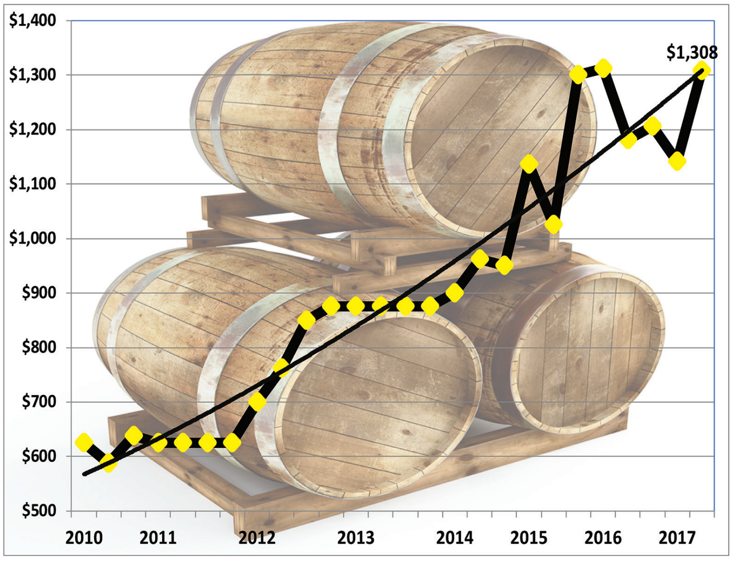


Figure 7. Delivered Tie Logs Prices in Kentucky 2010-2017 by Quarter ($/MBF)

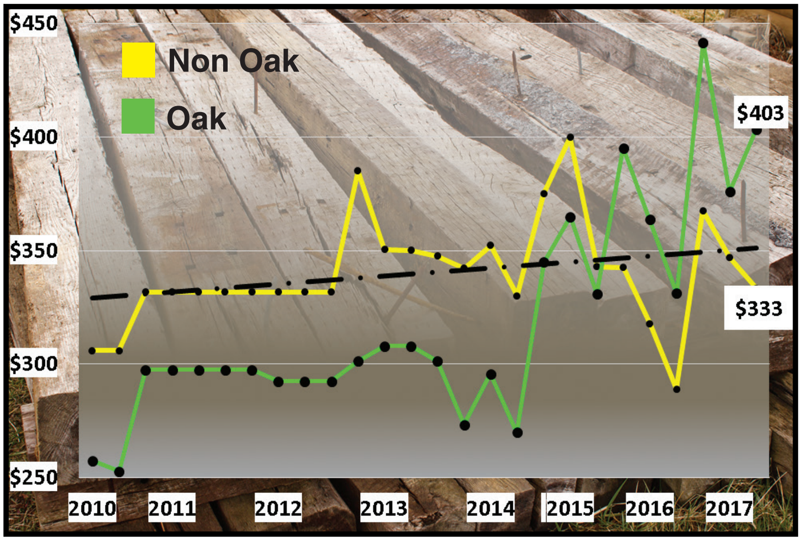


Figure 6, 7, and Table 2 Sources: Kentucky Division of Forestry's Delivered Log Price Data *(MBF = 1,000 board feet)*

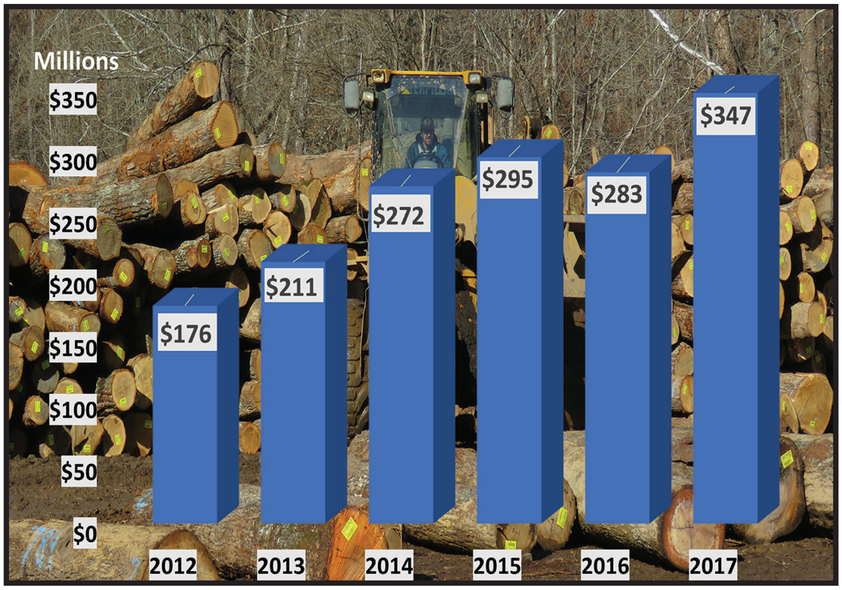
Exports

Kentucky's wood related exports grew substantially in 2017 to more than $347 million which is an increase of over 20 percent compared to 2016. With a minor exception in 2016, Kentucky's wood related exports have steadily increased since 2012 (Figure 8).

Kentucky oak continues to be in high demand around the world. More than 60 percent of all Kentucky wood related exports are oak, the majority of which is white oak for wood casks (barrels) and lumber. Railroad ties were another important export in 2017 at more than $26 million (Figure 9).

Asia imported more than $138 million in Kentucky wood related exports in 2017 followed by the European Union with over $112 million. The third region with the most Kentucky wood related imports was North America (Canada and Mexico) at $76 million. All other regions combined imported over $19 million in Kentucky wood related products (Figure 10).

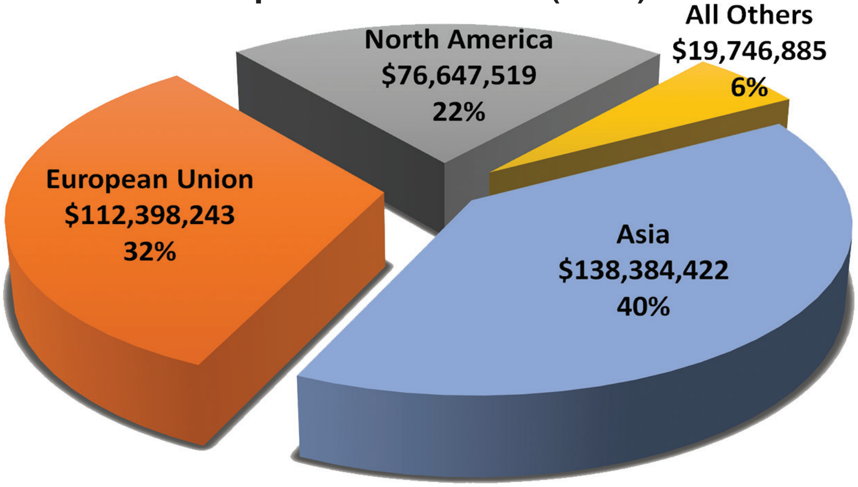
Figure 8. Kentucky Wood Related Exports (2012-2017)



Source above and below: U.S. Department of Agriculture Foreign Agricultural Services

Figure 9. Top 5 Kentucky Wood Related Exports (2017)

Figure 10. Kentucky Wood Related Export Destinations (2017)



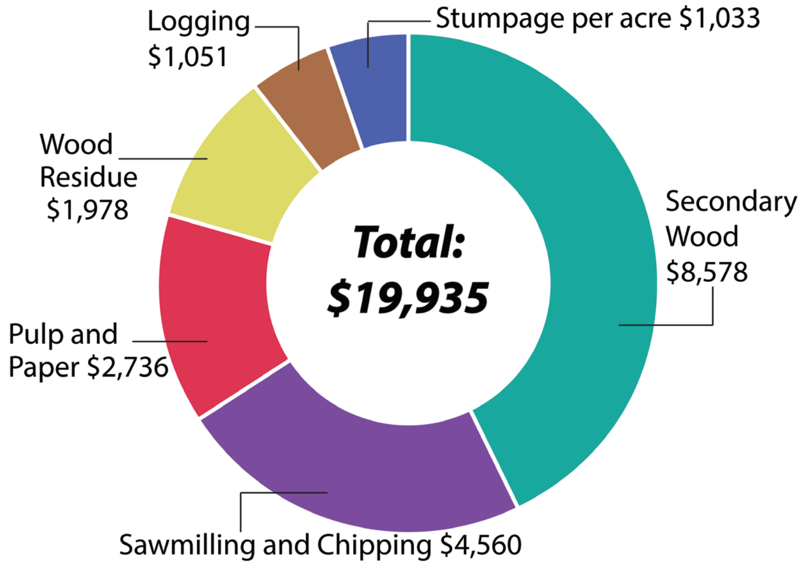
Log Exports: A growing concern?

Over the last few years, Kentucky and many other states have seen an increase in the amount of unprocessed logs leaving their borders. For many reasons, these export markets are often able to offer higher prices than sawmills in Kentucky. While the higher prices may be welcomed by Kentucky woodland owners, loggers, and log brokers it has the potential to erode Kentucky's sawmilling capacity as well as other parts of the forest sector. Tightly coupled with our sawmills is the secondary wood sub-sector which generates more than $2 billion annually and directly employs over 11,000.

Economic Contribution of One Harvested Acre to Kentucky

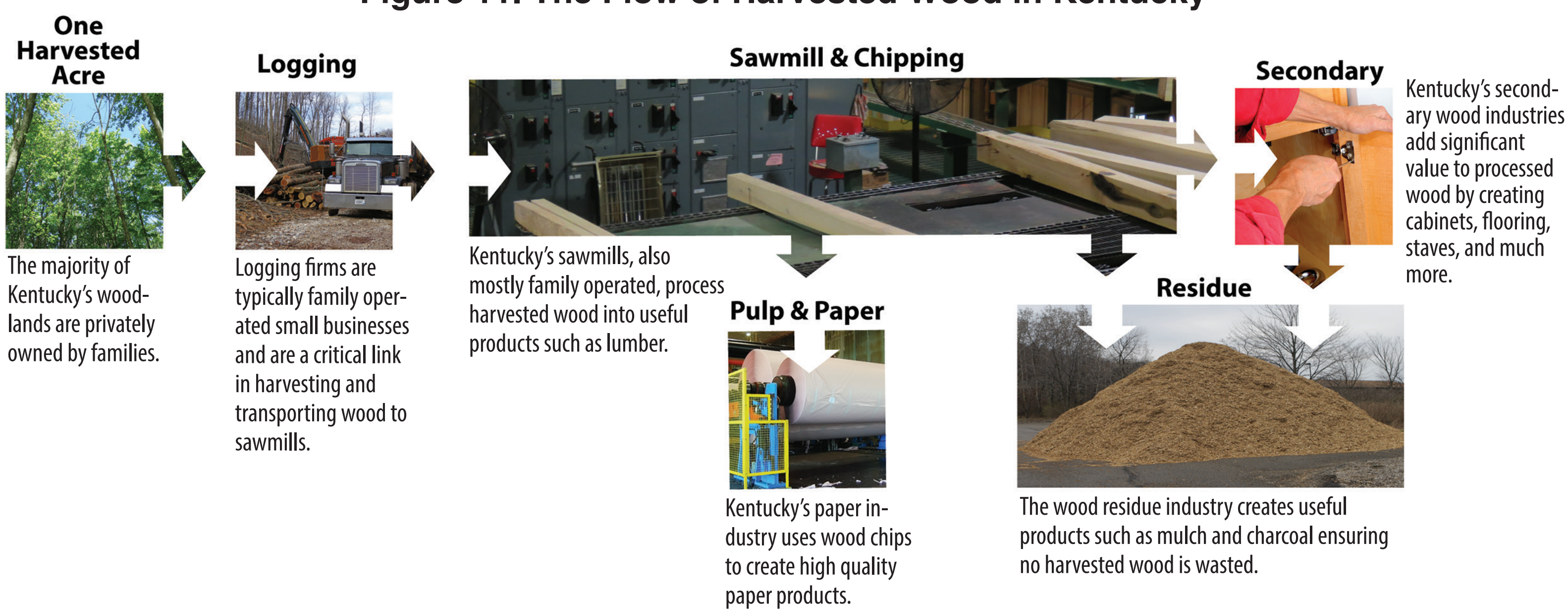
Kentucky's forests directly provide the wood resources for a significant portion of the forest sector's economic contribution. In total, each acre of harvested timber contributes an estimated $19,935 to Kentucky's economy. This contribution starts with the woodland owner that gets, on average, $1,033 per acre for timber sold. This is based on the statewide average of 3,563 board feet of timber harvested per acre at $0.29 per board foot. The wood then moves through a logger and to a mill for processing into primary products like lumber, cross ties or paper. Products from these industries move to secondary industries, like cabinet makers or industries that convert paper to a final product. Finally, mill "waste" such as sawdust, chips, and bark are also sold or used in a number of industries. Each step along the way, from the woodlands to the final wood using industry, contributes to the economy. Figure 11 shows the wood supply chain for the majority of harvested wood in Kentucky. Figure 12 shows the relative economic importance of each step. The most value is added by the secondary industry. Thus, ensuring that our raw material is processed into a final product in the state is extremely important to our economy. While woodland owners and logging are individually the smallest direct contributors, without woodlands and logging, the vast majority of our wood using industries would collapse.

Figure 12. The VALUE of a Harvested Woodland Acre to Kentucky



Source: IMPLAN Data for Kentucky and the Kentucky Forest Products Industry Directory

Figure 11. The Flow of Harvested Wood in Kentucky



This conceptional model traces the flow of harvested wood through numerous forest industries in Kentucky. Woodland owners grow, manage, and protect their woodlands and are the foundation of the Kentucky forest sector. Logging firms harvest and transport the wood to sawmills that convert the wood into products utilized by other wood industries such as cabinet and flooring manufacturers, paper makers, and residue users. Nearly all of the wood harvested in Kentucky is transformed into useful products and energy.

Growing Our Economy
+ Protecting Our Environment
= Supporting Our Forests

While the economic contribution of Kentucky's forests (or woodlands) is very visible in terms of jobs and economic activity there are countless other benefits that often go overlooked. Home to more than 100 tree species and thousands of other species of plants, animals, insects, fungi and microorganisms, Kentucky's woodlands support some of the greatest biodiversity in North America. Our woodlands help to filter out pollutants and sediments before they reach our water supplies, protecting Kentucky's extensive running waters and lakes. Woodlands help to clean air by sequestering carbon and other pollutants while also providing oxygen. Kentucky's woodlands provide the scenic backdrop for countless tourism and outdoor recreational opportunities including hiking, camping, hunting, bird watching, nature photography, and more. These important values along with the forests economic contribution indicates the importance of our forests and the care they should be afforded.

Approximately 88% of Kentucky's 12.5 million acres of forests are privately owned—mostly by families. According to the 2012 USDA Census of Agriculture, many farmers are also woodland owners—59 percent of Kentucky farms include 2.7 million acres of woodlands representing over 21 percent of Kentucky's woodlands. Supporting our forests grows our economy and protects our environment which is critical to the more than 370,000 forest owners with more than 10 acres of woodlands and the more than 26,000 fellow citizens directly employed by Kentucky's wood using industries.

5 Steps to Supporting Kentucky's Forests and Our Economy:

1. *Assess current and future threats to Kentucky's forests.* This requires an active monitoring and inventory system to quickly document, analyze, and address current and emerging threats. The Kentucky Division of Forestry and the US Forest Service are the key agencies tasked with actively monitoring and inventorying Kentucky's forests.
2. *Raise the awareness of the value of forests and the threats to them.* The University of Kentucky Cooperative Extension Service plays a prominent role in raising this awareness and educating woodland owners to manage their forests and proactively address looming woodland health threats.
3. *Promote and support forest management.* Kentucky's woodland owners often need technical assistance to manage their property along with incentive programs to help offset the long harvest intervals associated with hardwood trees. The Kentucky Division of Forestry is the key entity that assists woodland owners in managing their property and accessing federal cost-share assistance.
4. *Continue promoting best management practices in timber harvesting operations.* A professional, trained logging force is essential to protecting water quality and enhancing future forest conditions. The Kentucky Master Logger Program trains loggers to implement best management practices in timber harvesting operations.
5. *Ensure traditional and emerging economic forest-related opportunities for woodland owners and forest industry are available.* These opportunities will economically benefit the owners as well as the Commonwealth.

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