Kentucky Forestry
Economic Impact Report 2015

UK
UNIVERSITY OF
KENTUCKY

College of Agriculture,
Food and Environment
Forestry Extension

Table of Contents

About the Data

Numerous sources were used to develop this report including IMPLAN data from 2014 used to estimate both direct and total 2015 economic contributions. Direct economic impact refers to the economic activity directly associated with an industry sector. Total economic impact refers to the complete economic activity associated with an industry sector and includes direct, indirect, and induced effects. The IMPLAN data was adjusted to provide current year's 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 such as the USDA Forest Service's Timber Product Output data allowing reasonable estimates of current year's outputs. 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. Data from USDA NASS Census of Agriculture, RISI, the Kentucky Master Logger Program, and Kentucky Forest Industries Association members also provided value data used in this report.

List of Table and Figures:

All photos courtesy: Thomas Barnes, Billy Thomas, and Renee' Williams

Kentucky Forestry Economic Impact Report 2015

Authors
Jeff Stringer, Billy Thomas, Bobby Ammerman, Alison Davis[1]

Abstract
Forests cover nearly one-half of Kentucky and provide a wide range of both economic and non-economic benefits to the Commonwealth. The primary economic contributor is derived from the utilization of timber and wood resources. Analysis of Kentucky's forest and wood industries in 2015 indicated an estimated direct economic impact of $9.1 billion (up 9 percent from 2014). These industries employed over 28,000 individuals. Total economic impacts in 2015 were estimated above $14 billion for the first time ($14.6 billion) with a total employment of 62,445. This increase in both direct and total impacts has been on-going since 2012 with a $2.7 billion increase over this period as the wood industry has continued to recover from the recent recession. The economic impact was generated from forests located in all 120 counties of the Commonwealth providing resources harvested by over 1,200 logging firms and processed at 713 facilities located in 109 counties. These industries include sawmills, pulp and paper mills, and a wide variety of secondary producers such as cabinet, barrel, and flooring manufacturers. The 2015 sawlog production estimate of 762 million board feet indicates that Kentucky remains one of the leading producers of hardwood forest products in the U.S. Analysis shows that each acre of woodland harvested in 2015 was responsible for producing $23,965 in direct revenues and a total economic contribution of $39,743. Delivered log prices remained stable in 2015 while increased prices were paid for stave logs used for barrel production continuing a recent trend. This report highlights the importance of the economic contribution of the forestry sector to both rural and urban Kentucky in 2015.

Acknowledgments
The authors thank Kentucky Division of Forestry (KDF) personnel, particularly Stewart West, for providing necessary and invaluable information to this report; Chris Oswalt with USDA Forest Service's FIA unit in Knoxville; Mark Schuster, KDF coordinator of the Kentucky Master Logger Program; members of the Kentucky Forest Industries Association; and Terrell Baker with the University of Kentucky Department of Forestry. Special thanks go to Reneé Williams, Information Specialist with the University of Kentucky, Department of Forestry Extension for publication graphics and layout.

[1]Extension Professor of Hardwood Silviculture and Forest Operations; Extension Associate for Family Forest Education; and Extension Associate Secondary Forest Industry, University of Kentucky, Department of Forestry Extension; and Extension Professor, University of Kentucky, Department of Agricultural Economics, respectively.

Overall Impact

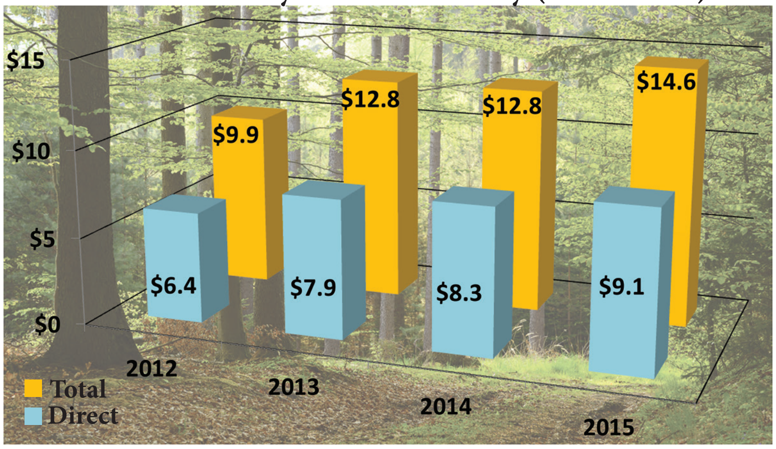
Direct Impact: $9.1 billion
Total Impact: $14.6 billion

In 2015, the forest industry was estimated to have provided $9.1 billion in direct economic contributions, an increase of 9 percent over 2014 and a five-year high for the sector (Figure 1). The total economic impact of the Forestry Sector that includes direct, indirect, and induced economic activity surpassed $14.5 billion. Direct employment in the forestry sector was relatively stable with a minor increase in 2015 to 28,408 compared to 28,202 in 2014. The sector generated a total employment of 62,455 with an earned income of approximately $1.5 billion.

Direct Employment: 28,408
Total Employment: 62,455
Earned Income: $1.5 billion

The number of facilities increased slightly to 713, as 10 new facilities came online in 2015, in 109 counties. Since the recession that started in 2008, the overall forestry sector has been steadily gaining ground with increases through 2015. The sector has experienced an average annual increase of 9 percent since 2012 adding over $4.5 billion in total impact to Kentucky over this time.

Figure 1. Annual Direct and Total Economic Impact of the Kentucky Forest Industry (2012-2015)



Source: Kentucky Forestry Economic Impact Reports. www.ukforestry.org

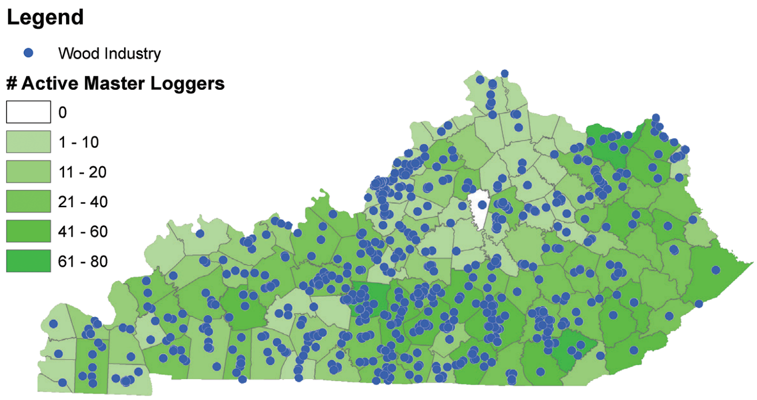
Both sawmills and logging are estimated to show increases in direct revenues in 2015; combined they are responsible for $1.3 billion in direct revenues, an increase over the $987 million in 2014. Secondary manufacturing slipped in 2015 to $1.8 billion compared to $2 billion in 2014. Kentucky's pulp and paper sub-sector was estimated to decline in 2015 to $1 billion. The decrease is due in large part to the idling of the Verso facility, one of Kentucky's two pulp and paper facilities, in November 2015. Analysis indicated that paper converters increased significantly in 2015 to an estimated $4.2 billion compared to $3.5 billion in 2014.

Wood related exports increased in 2015 with $295 million shipped compared to $272 million in 2014. While Asia significantly increased its imports of Kentucky wood products in 2015, Europe is still the leading export purchaser. In 2015 wooden barrels, both new and used, led exports. While the majority of this export was to Europe, white oak lumber, the second leading export, found its way to both Asia and Europe.

Economic Impact of Forest and Wood Industries

Kentucky forest industries include 713 wood manufacturing facilities across the Commonwealth (Figure 2). The occurrence of these facilities in 109 out of 120 counties, indicates broad distribution of the $14.6 billion and highlights the importance of this sector to rural communities. However, as indicated by the clustering of industries in urban areas, forest industry is also an important economic force in many of our metropolitan areas.

Figure 2. Kentucky Wood Industries and Master Logger Distribution 2015



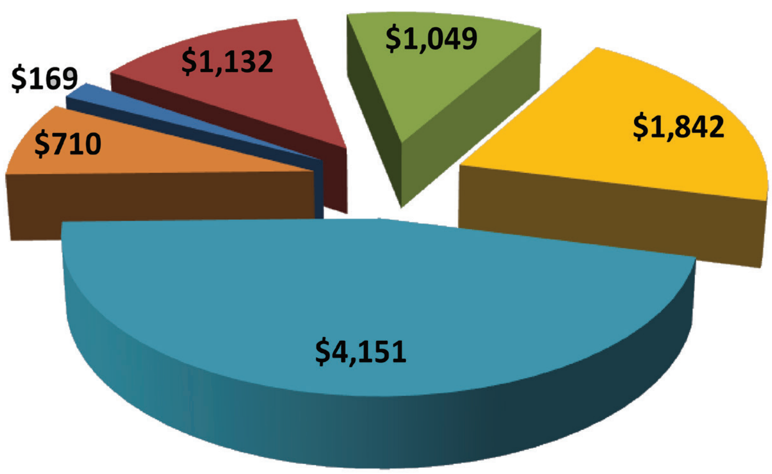
Source: Kentucky Master Logger Database and Kentucky Forest Products Industry Directory

Forestry Sub-sectors

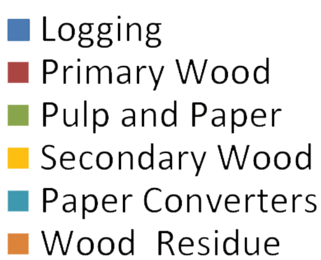
Logging: Logging firms had a direct economic impact of $169 million in 2015, an increase of 27 percent over 2014 (Figures 3). While this is the smallest sub-sector it arguably has the largest impact providing the raw material for many of our forest industries.

Solid wood manufacturing: Solid wood manufacturing includes both primary wood manufacturing (ex. lumber mills) and secondary wood manufacturing (ex. cabinet manufacturing). In 2015 primary manufacturing increased significantly, over 32 percent, compared to 2014. However, secondary manufacturing slipped to $1.84 billion from $2.04 billion in 2014, a 10 percent loss, with a reduction of approximately 1,000 employees (Figures 4). The reduction in secondary industry production is important as this sub-sector provides considerable indirect and induced impacts (almost equal to the direct contribution) to Kentucky's economy.

Figure 3. Direct Economic Impact by Kentucky Forestry Sub-Sectors in Millions



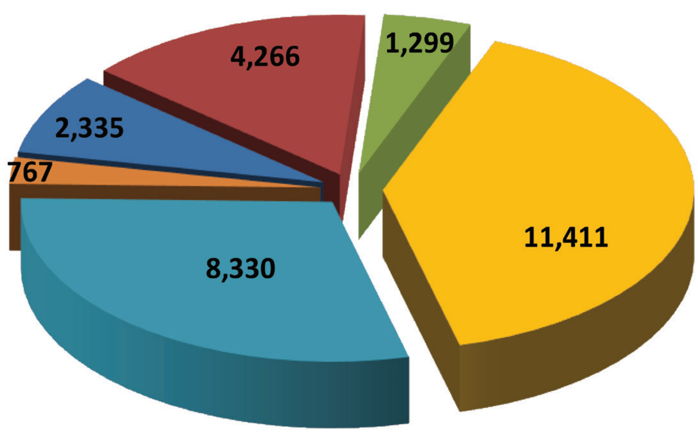
Paper: Paper represented a sizable portion of the forestry sector at an estimated $5.2 billion overall including pulp and paper manufacturing and paper converters. The latter are industries that manufacture finished paper products. The entirety of this increase was in paper converters as pulp and paper decreased almost 13 percent in 2015 largely as a result of the Verso mill idling in November 2015.



Figures 3 and 4 source: IMPLAN Data for Kentucky and the Kentucky Forest Products Industry Directory

Wood residue: Wood residues from both sawmilling and secondary manufacturers, including bark and wood mulch, increased in 2015, providing a direct contribution of over $710 million, up 34 percent over 2014.

Figure 4. Direct Employment by Kentucky Forestry Sub-Sectors

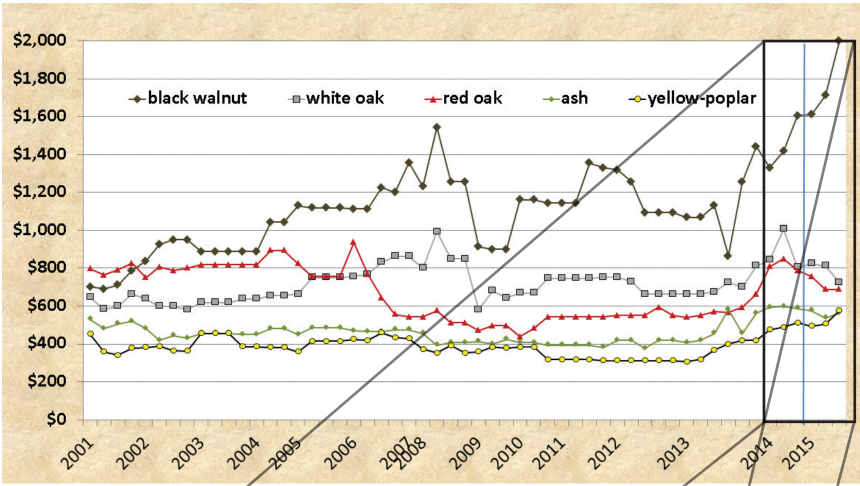


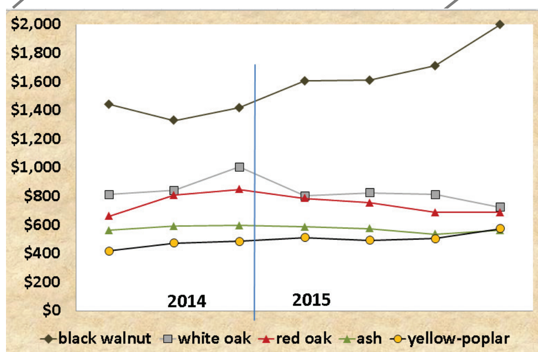
Sub-sectors outlook: Most economic forecasting indicates overall stability in 2016 for the sub-sectors with the exception of pulp and paper and logging. The idling of one of the two pulp and paper facilities in Kentucky in November 2015 may result in a 30 to 40 percent reduction of this sub-sector in 2016 if the plant does not re-open. Likewise, logging may be volatile owing to the reduction in this market for western Kentucky loggers.

Timber Output and Prices

Timber product output held steady in 2015 compared to 2014 with sawlog production at 762 million board feet. While the overall strength of the forestry sector increased in 2015, the year resulted in mixed pricing trends for delivered sawlogs that varied significantly by species (Figure 5). Two species, yellow-poplar and black walnut, exhibited increases in delivered mill prices in 2015. Yellow-poplar increased more than 6 percent and black walnut increased 22 percent, the latter continuing a significant upturn since the end of 2013. Other important species such as white oak, red oak, and ash exhibited decreases in 2015. Red oak lost 13 percent of its delivered log value

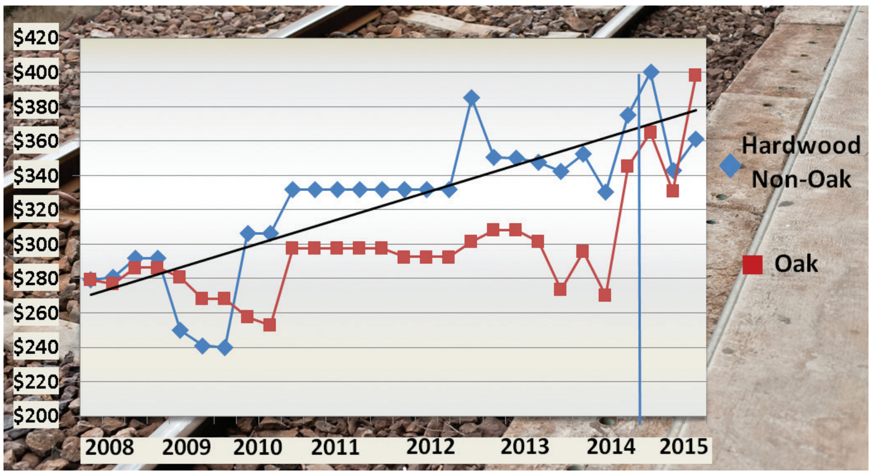
Figure 5. Delivered Grade 1 Sawlogs Prices for Major Species in Kentucky





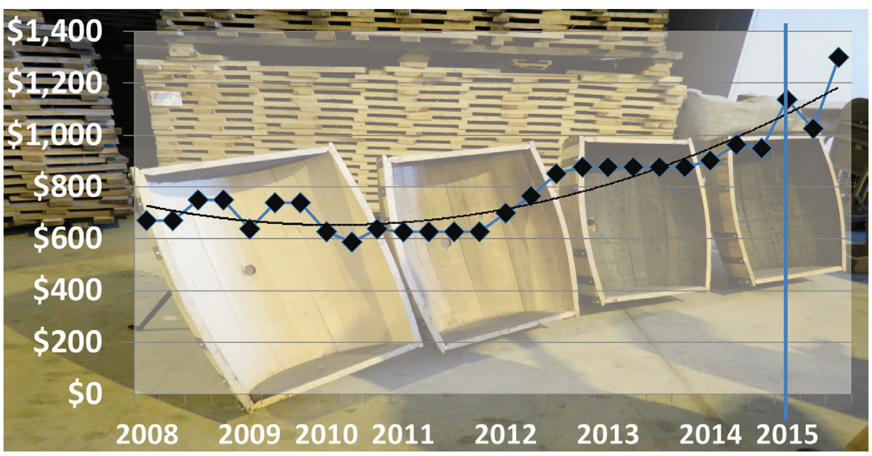
Source: Kentucky Division of Forestry's Delivered Log Price Data comparison between the 4th quarters of 2014 and 2015.

Figure 6. Delivered Tie Logs Prices in Kentucky 2008-2015 by Quarter ($/MBF)



Sources above and below: Kentucky Division of Forestry's Delivered Log Price Data

Figure 7. Delivered Stave Logs Prices in Kentucky 2008-2015 by Quarter ($/MBF)



for the highest grade logs while white oak decreased 11 percent in value. Delivered price for higher quality ash logs (grade 1) remained stable in 2015; however, lower quality ash logs lost significant value in 2015. Hickory had increased significantly in value in 2014 (greater than 30 percent for all grades), but all grades plateaued in 2015. Tie logs, used for the production of railroad cross ties increased compared to 2014 with oak tie logs reaching almost $400/MBF, outpacing non-oak tie logs, the first time this has happened since 2008 (Figure 6). Stave logs used for the production of barrels also continued an upward trend in delivered log prices in 2015. Stave logs reached $1,300/MBF in the fourth quarter of 2015, a 23 percent increase compared to the fourth quarter of 2014 (Figure 7). This increase corresponds to the increase in projected worldwide whisky sales.

Exports

Kentucky's wood- and paper-related exports exceeded $295 million in 2015 (Table 1). While Asia increased its imports of Kentucky wood products significantly in 2015, Europe remains Kentucky's leading export destination. Oaks continue to dominate Kentucky wood exports, led by wooden casks (barrels) at over $103 million followed by oak lumber (primarily white oak) at over $67 million, accounting for over half of all wood related exports.

Table 1. Top 5 Kentucky Wood, Paper, and Pulp Exports in 2015 in Millions

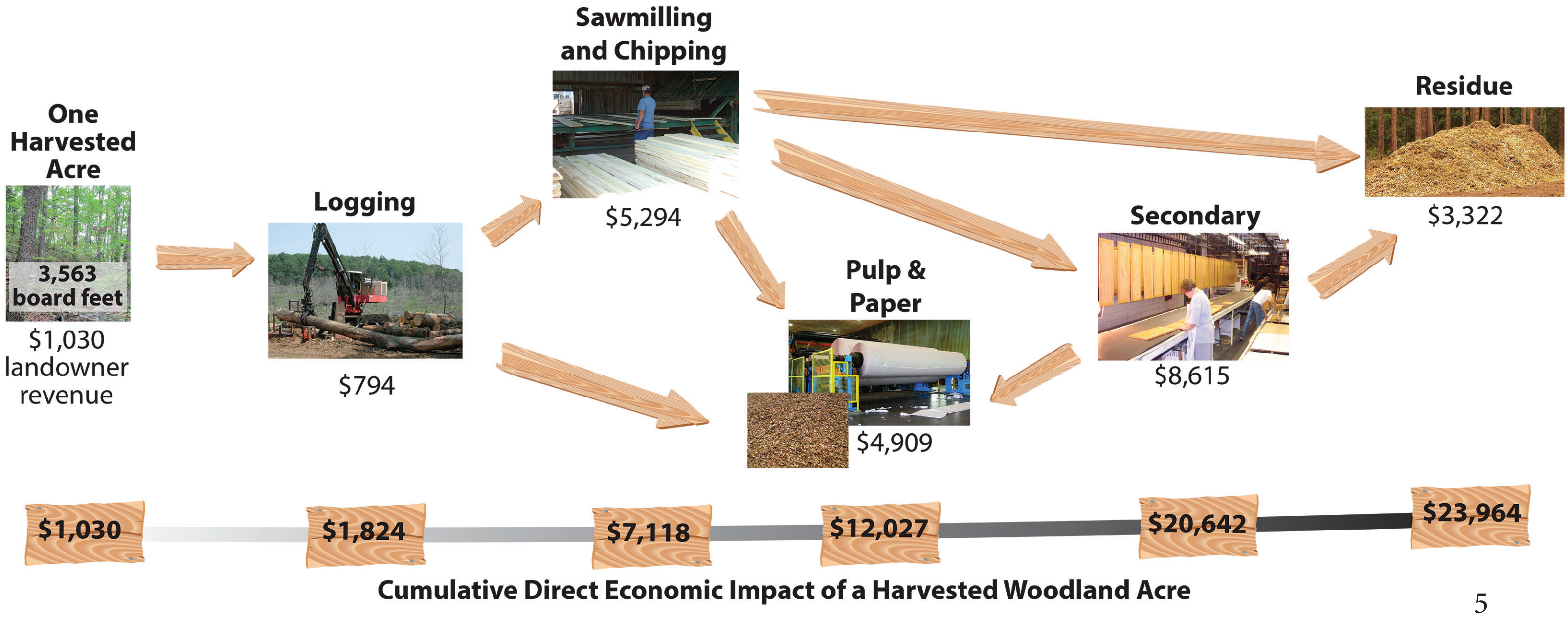
Wooden Casks (Barrels)	$103,287,884
Oak Lumber	$67,927,578
Hardwood Lumber	$25,085,404
Ash Lumber	$15,898,818
Railroad Ties	$12,341,996

Source: U.S. Department of Agriculture Foreign Agricultural Services

The Economic Impact of One Acre of Harvested Timber

Kentucky's forests provide the timber resources for a significant portion of the forestry sector's economic impact. This includes timber revenues for landowners selling timber and revenues from logging, milling, residual products such as bark, and secondary industries that use lumber and other primary products. Therefore, every acre of timber that is harvested yields significant returns, not just for the landowner, but for the Commonwealth as a whole. In Kentucky, on average, a timber harvest yielded 3,563 board feet of timber. In 2015, the average value of standing timber was $0.29 per board foot or $1,030 of revenue for the landowner for each acre harvested (Figure 8). The average harvested acre also provided $794 in direct revenue for the loggers who cut and haul the timber. The majority of our timber is processed at mills in Kentucky resulting in $5,294 in direct revenues for sawmills and $4,909 for pulp and paper mills. By-products such as bark from the mills also are an important revenue generator, yielding $3,322 per acre of timber harvested. Finally, our secondary industries that manufacture finished furniture, furniture parts, flooring, barrels, and a host of other products contributes significant added value to the forest sector yielding $8,615 per acre of harvested timber. In total, one acre of timber harvested results in $23,965 to the Commonwealth in direct revenue and a total of $39,743 including indirect and induced revenues.

Figure 8. 2015 Economic Impact of One Acre of Harvested Timber in Kentucky



Kentucky's Forests: More than Timber

It is important to recognize that Kentucky's forests are predominantly owned by private woodland owners, and their properties form the base of this important industry. While they do receive timber sale income their properties also provide many other benefits free of charge to society. These environmental and cultural benefits include ecosystem services such as: cleaner air and water, carbon sequestration, biodiversity, and wildlife habitat, not to mention providing Kentuckians and thousands of visitors with recreational opportunities, aesthetic beauty, and many other intrinsic values. Accounting for these significant impacts continues to be a challenge; however, a soon to be published paper[1] by researchers at the University of Kentucky Department of Forestry provides insight into some of the economic values of the ecosystem services provided by the reforestation of reclaimed mined land in Eastern Kentucky. The researchers evaluated four ecosystem services provided by reforestation on reclaimed mine sites: carbon sequestration, water quantity and quality, wildlife biodiversity, and cultural value. They found that those ecosystem services on a reforested acre of reclaimed mined land averaged $500 annually (with a range of $47 to $3,164). Clearly, Kentucky's forests, and their owners, provide many environmental benefits beyond the timber resources that support Kentucky's forest and wood industries.

[1](Xiaoshu Li, Andrew Stainback, and Chris Barton: *Valuing the Environmental Benefits from Reforestation on Reclaimed Surface Mines in Appalachia*)

FORESTRY EXTENSION

Department of Forestry
Forestry Extension Office
University of Kentucky
216 Thomas Poe Cooper Bldg.
Lexington, KY 40546-0073
859.257.7597
www.ukforestry.org

FORFS 16-02

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin. Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Nancy Cox, Director of Cooperative Extension Programs, University of Kentucky College of Agriculture, Food, and Environment, Lexington, and Kentucky State University, Frankfort. Copyright © 2016 for materials developed by University of Kentucky Cooperative Extension. This publication may be reproduced in portions or its entirety for educational or nonprofit purposes only. Permitted users shall give credit to the author(s) and include this copyright notice. Publications are also available on the World Wide Web at www.ukforestry.org