



Timber Harvest Levels and Pressure on Shortleaf Pine in Missouri

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Harvest pressure on Missouri's shortleaf pine (*Pinus echinata*) forests is evaluated using Timber Product Output (TPO) and Forest Inventory and Analysis (FIA) data. The TPO survey consists of a census of all primary mills and is a snapshot of timber use. TPO data show that annual shortleaf pine harvest in Missouri varied between 4.0 and 8.9 million cubic feet from 1969 to 2009. FIA field plots are another method used to estimate shortleaf pine growth and removals on an annual basis. From 1999 to 2003, FIA data estimated an annual harvest of shortleaf pine to be 7.6 million cubic feet; from 2004 to 2008, annual harvests were 3.4 million cubic feet and from 2009 to 2013, annual harvests were 11.1 million cubic feet. FIA data also show annual harvests remove between 13% and 62% of net growth of shortleaf pine growing stock. With growth exceeding harvest removal, shortleaf pine utilization is sustainable.

USFS Forest Inventory and Analysis

FIA data from the 1999–2003, 2004–2008 and 2009–2013 inventories were used to analyze the inventory of shortleaf pine in Missouri during these years.¹ The inventories demonstrated wide variation in shortleaf pine growth, as well as harvest removals of the species (Table 1). This is due, at least in part, to the small number of randomly located plots and the even smaller number of those plots on which a shortleaf pine harvest had taken place.

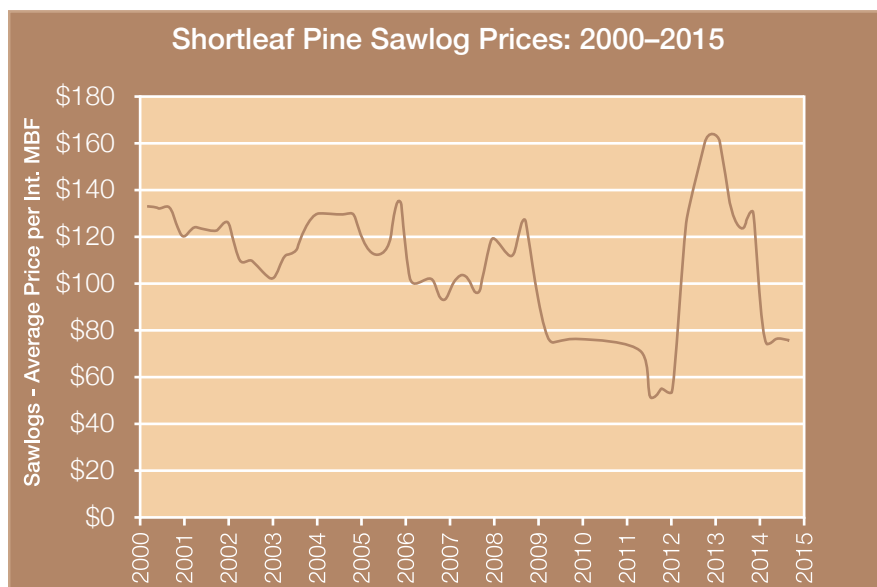


Figure 1: Shortleaf pine prices for sawlogs [Int-MBF] in Missouri from years 2000–2015.

Timber Product Output Data

The TPO survey is an on-going cooperative effort between the Missouri Department of Conservation (MDC) and the USDA Forest Service's Northern Research Station (NRS).² MDC foresters visit all primary wood-using mills within the State every three years. They use questionnaires designed to determine the size and composition of the resources that are utilized by the State's primary wood-using industry. Survey questions and reports refer to wood-use during the previous calendar year. Follow-up visits are made as needed in an effort to achieve a 100-percent response. Timber removals by source of material and harvest residues generated during logging are estimated using factors developed from logging utilization studies previously conducted by NRS. Table 2 displays total industrial roundwood and shortleaf industrial roundwood production in Missouri using TPO survey data.

Missouri Timber Price Data

The MDC surveys Missouri foresters, loggers, and members of the forest industry on a quarterly basis to determine current price trends in the State.



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Table 1: Average net annual growth and average annual harvest of shortleaf pine in Missouri forests by survey year (in 1,000 cubic feet).¹

Survey Year	Volume	Growth	Harvest	% of Growth
1989	618,327	17,975	na	na
2003	751,476	18,480	7,604	41.1
2008	861,242	25,553	3,428	13.4
2013	902,794	17,919	11,118	62.0

Survey response is voluntary and confidential; MDC has no statutory or regulatory power to require foresters to report sales. For this reason, most reported sales tend to be reported by professional foresters and the results must be interpreted with that caveat in mind. It is inferred that forester-assisted sales, which tend to be inventoried, marked, and bid out, represent the upper range of prices paid for stumpage. The MDC publishes the survey results quarterly as Missouri Timber Price Trends and makes the publication available to landowners and the forest industry in paper and on the web. Foresters turning in reports are free to lump species together in sale reports, and often do. Consequently, detailed price data for shortleaf pine is not available for all reporting periods. Stumpage prices for shortleaf pine sawlogs ranged between \$90 and \$155 per International ¼” million board feet (Int-MBF), according to sales reports collected for Missouri Timber Price Trends.²

Figure 1 shows prices for shortleaf pine sawlogs in Missouri from years 2000 to 2015 based on reports received for the Missouri Timber Price Trends publication. These reports are voluntary and come from sales assisted by a professional forester. As such, the price trends shown tend towards the price for a well planned sale that is bid out to multiple loggers.

Results and Discussion

Shortleaf pine accounted for approximately 4% of the total roundwood utilized in Missouri and harvest was reported to have removed between 13% and 62% of net growth in recent inventories. In addition, FIA plot data can be analyzed to show growth and harvest removals by public and private ownerships, with capabilities to display acreage in each ownership category.

Although 83 percent of timberland in Missouri is privately owned and 85 percent of all stock volume occurs on that private land, only about 50% of shortleaf pine growth occurs on private land. Approximately 48% of all growth is harvested on private land and 5% is harvested on public land. Shortleaf pine continues to grow faster than it is being harvested in Missouri, a clear indicator of sustained yield.

Many factors contribute to forest utilization, including markets, availability, and operability. The lower rate of utilization (as a percentage of growth) of shortleaf pine on public lands may indicate that public land managers could play a valuable role in helping develop and improve markets for shortleaf pine. Conversely, higher rates of utilization on private lands may suggest that private landowners may be willing to take advantage of such markets for shortleaf pine. This gap demonstrates that the full economic benefits of shortleaf are not yet being realized by landowners or as part of land management plans.

Table 2: Total and shortleaf industrial roundwood production by year in Missouri*.

Survey Year	All Roundwood (1,000 cubic feet)	Shortleaf Pine Roundwood (1,000 cubic feet)	Shortleaf Pine (% Total)
1991	121,392	8,865	7.3
1994	132,593	8,127	6.1
1997	139,643	8,723	6.2
2000	128,974	5,239	4.1
2003	128,106	4,560	3.6
2006	125,033	4,940	3.9
2009	102,624	4,272	4.1

Table 3: Growth, harvest and percent of growth harvested by ownership type (% of cubic foot volume)¹

Survey Year	Growth		Harvest		Harvest as of % of Growth	
	<i>Private</i>	<i>Public</i>	<i>Private</i>	<i>Public</i>	<i>Private</i>	<i>Public</i>
2008	52%	48%	81%	19%	21%	5%
2013	57%	43%	66%	34%	72%	48%

References

¹Forest Inventory Data Online (FIDO) <http://apps.fs.fed.us/fia/fido/index.html>

³Missouri Timber Price Trends <http://mdc.mo.gov/your-property/professional-forest-management/timber-management-and-harvest/timber-price-trends>

²Piva, Ronald J.; Treiman, Thomas B. 2012. Missouri timber industry: an assessment of timber product output and use, 2009. Resour. Bull. NRS-74. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 88 p. http://www.nrs.fs.fed.us/pubs/rb/rb_nrs74.pdf



Shortleaf pine (*Pinus echinata*) forests and associated habitats contain extraordinary cultural, ecological, and economic value by providing wildlife habitat, recreational opportunities, enhanced water quality, and high value wood products. Despite these values and services, shortleaf pine has significantly declined across much of its 22-state range. These fact sheets provide tools and resources necessary for the restoration of shortleaf pine.