Summary – Criterion 5

Forests in Delaware currently contain nearly twenty million tons of carbon and this amount has increased with maturation of the forests. Urban forests, in addition to removing pollutants, also reduce energy consumption by cooling urban areas in the summer and warming them during the winter. This helps mitigate the effects of global climate change, which is directly related to the S&PF national priority to *Enhance public benefits from trees and forests*. Forest management activities can lead to increased growth rates and increased uptake of carbon in vigorously growing stands. Expanding forested areas in both rural and urban areas—and reducing their permanent loss to development and other land uses—increases carbon sequestration and storage. Maintaining and managing our rural and urban forest resources provides a wide variety of benefits, including carbon sequestration and storage.

Criterion 6: Maintenance and Enhancement of Long-Term Multiple Socioeconomic Benefits to Meet the Needs of Societies

Forests provide a wide variety of social, cultural, and economic goods, services, and other benefits that contribute to meeting the needs of society. Many people and communities are dependent on forest for their livelihood and well-being. Information on the production and consumption of forest products, investment and employment in the forest sector, forest-based recreation and tourism, and other social and cultural forest values illustrate the many benefits forests provide. The markets for forest products are a significant sector of our state's economy. Maintaining and growing these markets is vital not only to Delaware's economy but also sustaining the forest land base—owners need to generate sufficient income from their forests to retain their forests. Furthermore, it is important to develop new markets, such as wood energy, to maintain a robust and diverse forest products economy so it is not overly dependent on a single market. Public investment in forests, forest markets, and forest research is also necessary to ensure a sustainable land base and the best information is available to landowners and decision-makers. Addressing all of these issues is necessary to help ensure that Delaware's forests will continue to meet society's needs in the future.

INDICATOR 12

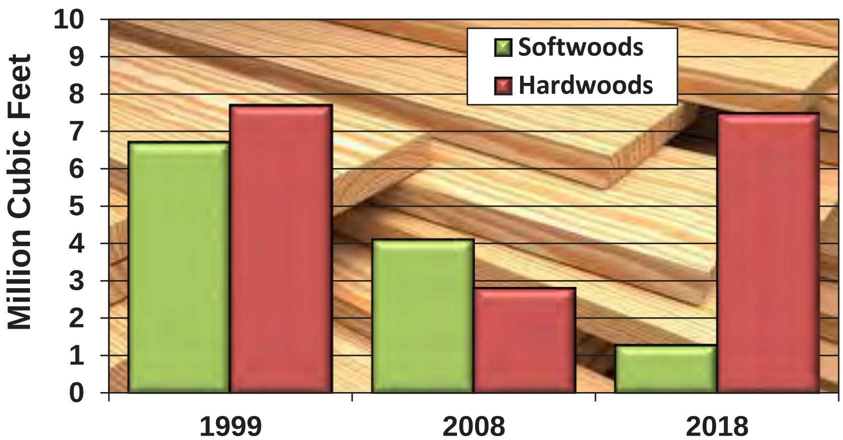
Wood and wood products production, consumption, and trade

Wood products have always been a critical component of Delaware's economy. Lumber remains the primary building material for new houses. Pulp, paper, and other forest products provide many of the household goods often taken for granted. In 1965, the total consumption in the United States of solid wood products, paper, and pulp was 13.3 billion cubic feet. By 2005, consumption of these products had grown to 20.0 billion cubic feet, an increase of 50%. This total dropped to 13.1 by 2009 but recovered somewhat by 2017 to 17.1 billion cubic feet (USFS Res. Pap FPL-RP-701). Delawarean's appetite for wood and wood products continues to grow—it is important that our state maintain a sufficient forest base and the technology to help meet this demand.

Wood removals and product class

In 1999, approximately 14.4 million cubic feet of growing-stock were removed through timber harvests in Delaware. In 2008 that number dropped to 6.9 million cubic feet and in 2018 removals totaled 8.8 million cubic feet. Volumes of softwoods and hardwoods were nearly equal in 1999, but by 2008 both declined significantly but with softwood removals greater than that of hardwoods (Figure 35). By 2018 hardwood removals returned to the 1999 level but softwoods removals continued to decline.

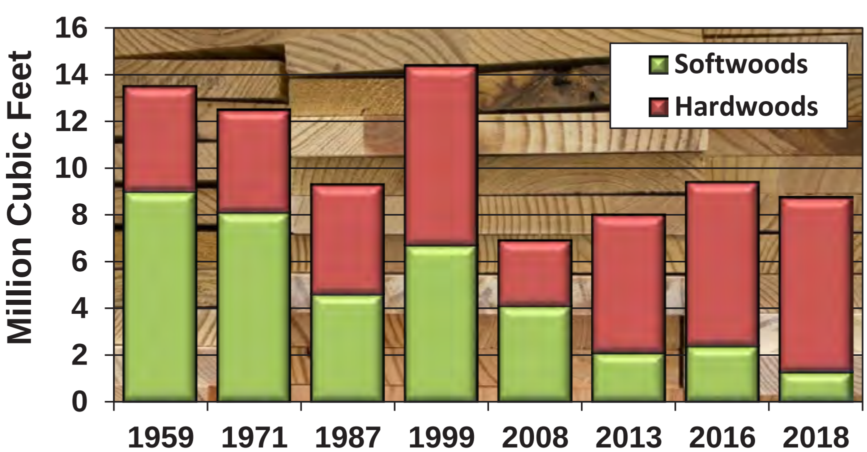
Figure 35. Wood removals in Delaware, 1999, 2008, and 2018.



Source: U.S. Forest Service Forest Inventory and Analysis

Historic removals from 1959 to 1999 did not fluctuate greatly—annual removals ranged from approximately 10 to 14 million cubic feet (Figure 36). This relatively consistent harvest reflects the fact that Delaware's forested acreage remained fairly constant during that time period. The proportion of hardwood to softwood volume has since increased considerably, however, due to the replacement of loblolly pine stands by hardwood stands as well as reduced demand due to the loss of several pine sawmills on the Delmarva Peninsula. Additionally, markets for small and poor-quality hardwood timber, primarily pulpwood and wood chips for the prison in Princess Anne, Maryland, increased over the last two decades.

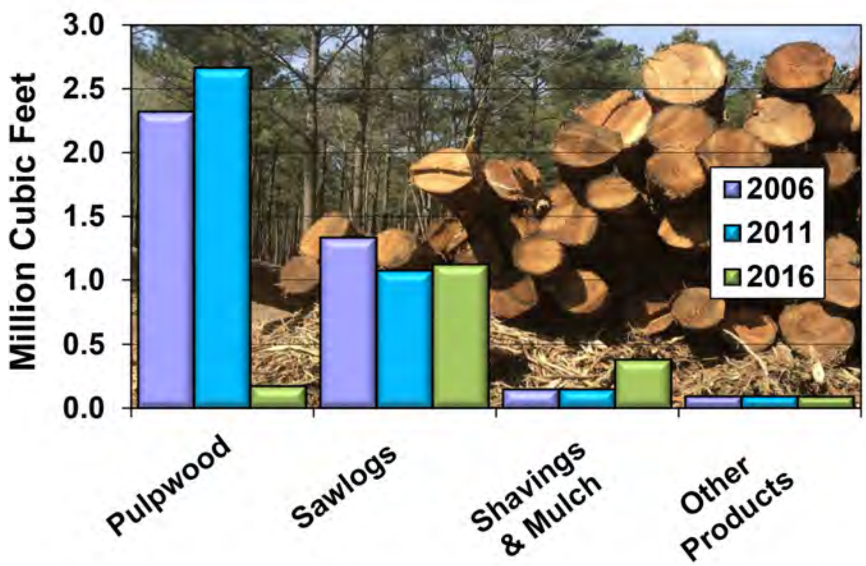
Figure 36. Annual growing-stock removals, 1959–2018.



Source: U.S. Forest Service Forest Inventory and Analysis

Pulpwood and sawlogs accounted for more than 90% of the total volume harvested in 2006 and 2011, but only amounted to 74% in 2016 (Figure 37). Shavings and mulch, which only accounted for 4% of the harvested volume in 2006 and 2011, increased to 22% in 2011. The remaining volume consisted of posts, poles, firewood, and industrial fuelwood. Note the collapse in the demand for pulpwood, once the mainstay of Delaware's timber industry, from 2011 to 2016. Nearly all of these harvests occur on privately-owned forestland—State Forests and a portion of State Wildlife Areas are the only publicly-owned forests that are actively managed for timber production.

Figure 37. Timber harvest by product class, 2006, 2011, and 2016.



Source: U.S. Forest Service Forest Inventory and Analysis

A unique and important market for byproducts from sawmills in Delaware and the Delmarva Peninsula is bedding for the poultry industry.

The Delaware Forest Service (DFS) tracks most of the state's timber harvesting through its notification system required by the state's *Erosion and Sedimentation Law* (Title 3, Chapter 10, Subchapter VI) for all harvests exceeding one acre. In the period (2010–2019) since our last assessment, on average, approximately 2,683 acres of timber are harvested annually—down from 4,567 acres, on average, from 2000 to 2009.

Approximately 37% of this most recent total (974 acres [2,467 prior to 2010—54%]) were clearcut harvests, 33% were selection harvests (867 acres [1,461 prior to 2010—32%]), and the remainder were pine thinning harvests (797 acres [638 prior to 2010]). While the size, quality, and species of trees vary greatly by harvest, and thus the timber harvest revenue varies depending on these factors, the DFS estimates that these harvests return at least $2.5 million each year to landowners. While still significant, the overall timber income has decreased markedly (estimates are at least 33%) because the dramatic decrease in timber prices caused, in large part, by the precipitous drop in lumber prices following the collapse of the real estate market and housing industry and the resulting closure of sawmills.

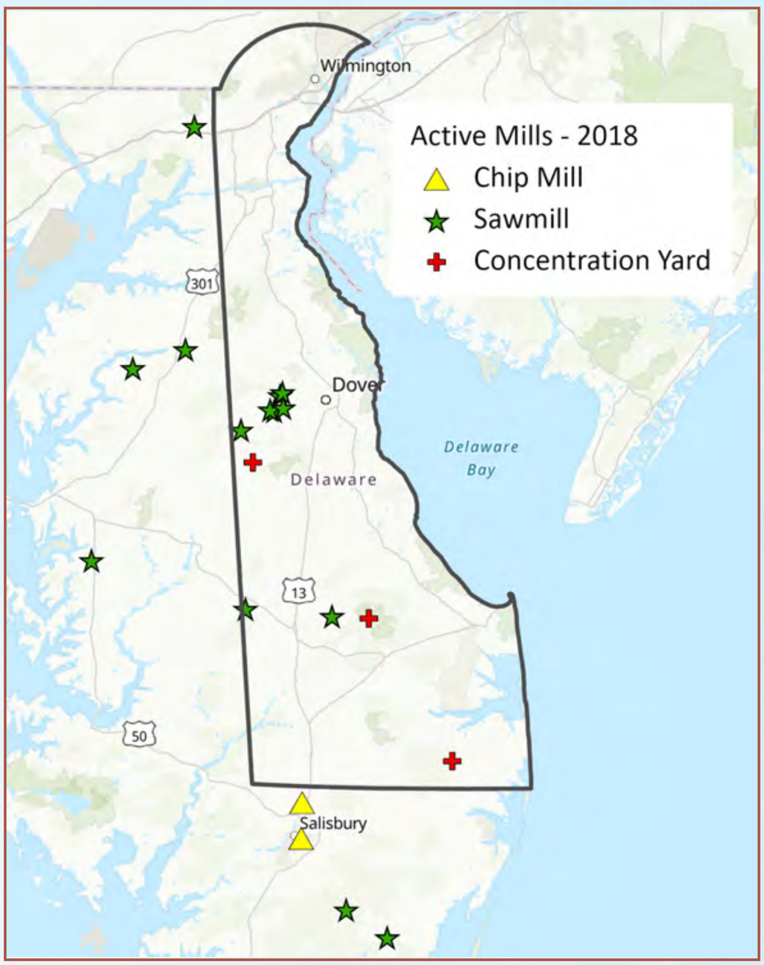
A somewhat unique, and important, market for byproducts from sawmills in Delaware and the entire Delmarva Peninsula is bedding for the poultry industry. Sussex County Delaware produces more chickens (broilers) than any county in the nation. This requires large amounts of bedding material, much of which is supplied as shavings and sawdust (pine is preferred but hardwood sawdust is also used) from the mills.

Mills on Delmarva

It is worth noting that the bulk of the timber harvested in Delaware is processed out of state. There are no major sawmills or other wood processing facilities in the state. Two sawmills process pine sawtimber from Delaware—both are located in Maryland counties adjoining Delaware. Twenty years ago, there were at least eight pine sawmills on the Delmarva Peninsula. Most of the state's hardwood sawtimber is processed by three mills—all located in Maryland—although there are nine small sawmills, including Amish-owned mills, in southern and central Delaware. These nine sawmills specialize in hardwood sawtimber.

There are also two small concentration yards in southern Delaware that purchase some pine and hardwood timber. Pine and hardwood pulpwood is supplied to a single mill in Spring Grove, Pennsylvania, and a pulp/chip products producer located in Maryland. The paper mill has a satellite chip mill located on Maryland's Eastern Shore, and the pulpwood company operates one of the previously mentioned concentration yards in Delaware. Figure 38 shows the locations of these mills and concentration yards.

Figure 38. Delmarva Peninsula mills, 2018.



Source: Delaware Forest Service and Maryland Forest Service

Although difficult to quantify, there is a slow increase in the number of portable sawmills in the area, including small, often solar-powered lumber dry kilns. The impact of these niche operations may grow in coming years and the technical assistance needed by these operators is often quite different from that of traditional larger sawmills.

The bulk of the timber harvested in Delaware is processed out of state. There are no major sawmills or other wood processing facilities in the state.

Conclusions

Over the last 20 years, annual softwood removals have decreased from 6.7 to 1.3 million cubic feet, while annual growth averaged 5.2 million cubic feet. This is encouraging because for the forty years prior to 2000, removals far exceeded growth and this, in the long run, is unsustainable. Annual hardwood harvests rose significantly by 1999 (to 7.7 million cubic feet) and then the following ten years bottomed out at 2.8. However, the last ten years has seen a steady increase in annual hardwood removals. The majority of wood volume harvested in Delaware falls into pulpwood and sawlog product classes and virtually all of this timber is processed out-of-state.

INDICATOR 13

Outdoor recreational participation and facilities

In addition to forest products such as lumber and paper, forests provide many non-extractive benefits. Public recreation is one such benefit. The recreational infrastructure and the degree to which people are using forests for recreation help us understand the importance of recreational opportunities in our forests.

Outdoor recreation

Forests offer a wide variety of outdoor recreational opportunities. Table 13 details public participation in ten outdoor activities. Most of these activities occur in part or entirely within forested areas. Estimates were based on a survey of Delaware households, and the number of participants was calculated using Delaware Population Consortium figures for the number of Delaware households and the average household size (2.61 people/household).

Table 13. Participating individuals in outdoor recreation, 2018.

Activity	*Participation %*	*10 Year Change*	*Number*	*10 Year Change*
Walking or jogging	82	-3	754,100	+13,100
Picknicking	66	+3	607,000	+60,000
Swimming	62	-3	570,200	+3,200
Bicycling	59	-1	542,600	+19,500
Fishing	56	+9	515,000	+105,000
Hiking	55	+9	505,800	+104,800
Camping	44	+13	404,600	+134,600
Canoeing/Kayaking	41	+14	377,100	+142,100
Hunting	28	+13	257,500	+126,500
Horseback riding	22	+5	754,100	+54,300

Source: Statewide Comprehensive Outdoor Recreation Plan, 2018-2023

DE population 2010	891,464
DE population 2020	995,764
10-year increase:	104,300