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Forest Service

**Northeastern
Research Station**

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**West Virginia Bureau
of Commerce
Division of Forestry**

THE MOUNTAIN STATE'S FORESTS— TRENDS IN THE RESOURCE

Photo courtesy of Gary Lake

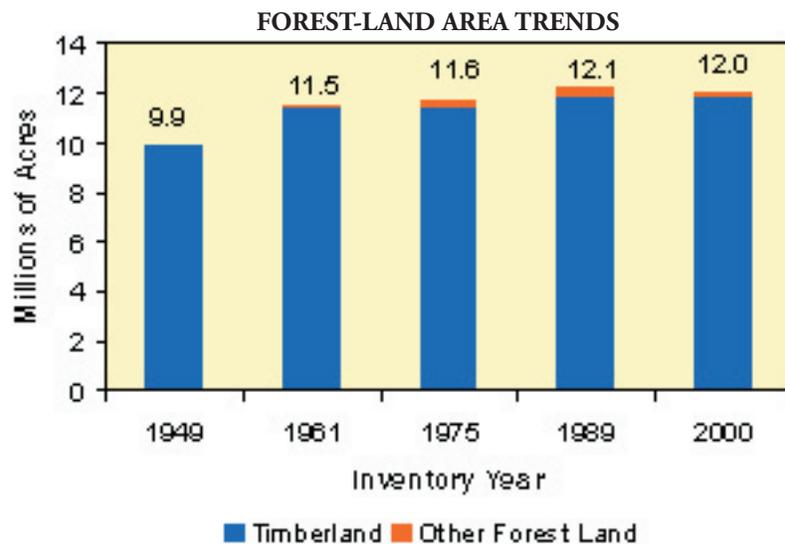


WEST VIRGINIA'S FORESTS

Forests protect watersheds, provide opportunities for recreation and settings for aesthetic enjoyment, serve as habitat for wildlife, and produce wood and other forest products. They have played a major role in the history and culture of West Virginia. Highlighted in this brochure are significant trends in West Virginia's forests over the last half century. Data are summarized from reports published by the USDA Forest Service, which periodically inventories the forests of all 50 states. In cooperation with the West Virginia Division of Forestry, the Northeastern Research Station completed the fifth statewide inventory of West Virginia's forest resource in 2000.

FOREST-LAND AREA REMAINED STABLE

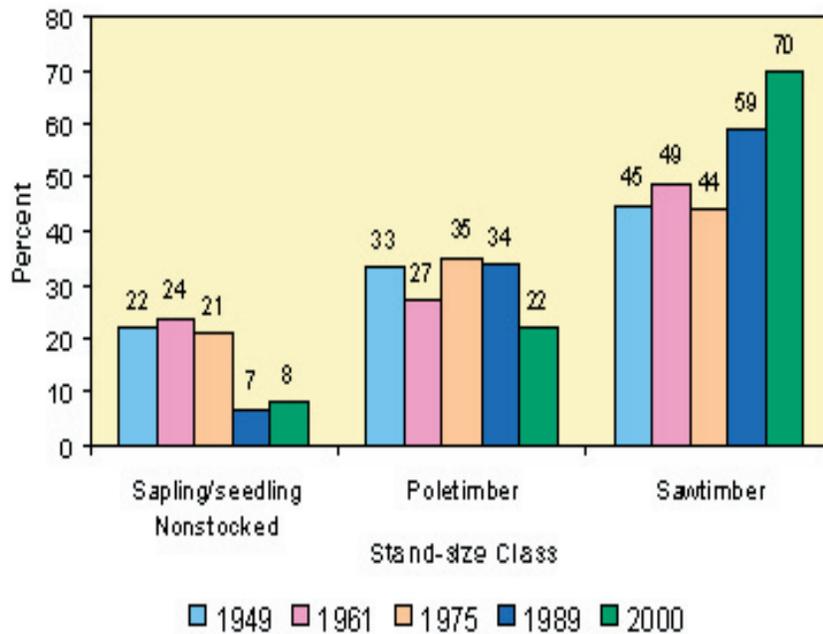
Forests cover 12 million acres of West Virginia. Since the 1960's, there has been a small increase in forest land area in the State. These increases occurred because new forest land coming from overgrown fields and pastures more than offset losses to road building, mining, and development for other nonforest uses. The slight decrease in forest land in 2000, though not statistically significant, may signal that the area of forest land has peaked in West Virginia, which remains the third most heavily forested state in the Nation with 78 percent of its area in forest.



Forest land is categorized by the Forest Service as timberland or “other” forest land. These categories aid in understanding the availability of forest resources and forest management planning. Ninety-eight percent of West Virginia's forest land is classified as timberland. These are forests that are potentially available for the production of timber products, though many owners hold forest land for reasons other than timber production. There are 11.8 million acres of timberland in West Virginia.

The “other” category of forest land includes reserved lands and unproductive forests. Harvesting for timber products on these lands is administratively restricted or economically impractical. Examples include natural areas on National Forests, wildlife preserves, and wetlands where growing conditions are poor. This category covers 210,000 acres in West Virginia.

**PERCENTAGE OF TIMBERLAND
BY STAND-SIZE CLASS**



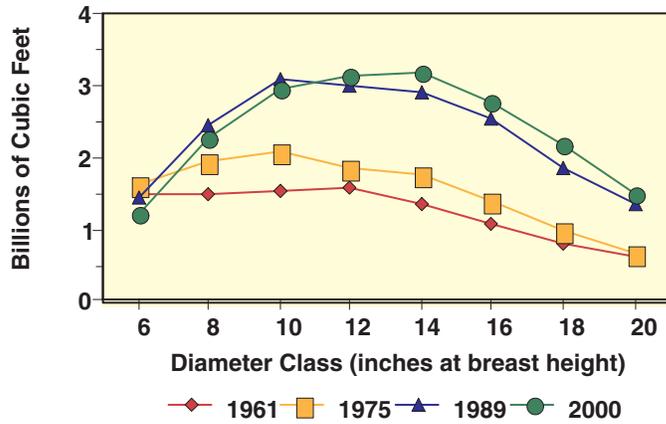
In West Virginia, 22 percent of the forest stands are of poletimber size. Trees in these stands are not sufficiently mature to produce large amounts of nuts and seeds, and their present value for use in commercial products is very limited.

Stands classified as sapling-seedling and nonstocked decreased from early inventories to 8 percent in 2000. Typically found in such stands are early successional, pioneer tree species as well as a variety of herb and shrub plants that need full sunlight to survive. These stands provide unique nesting and feeding habitat for wildlife. Besides offering diverse habitat for wildlife and providing a steady flow of wood products, forests that contain all stand sizes might be more resistant to devastating outbreaks of insects and diseases.

THE VOLUME OF TREES HAS INCREASED

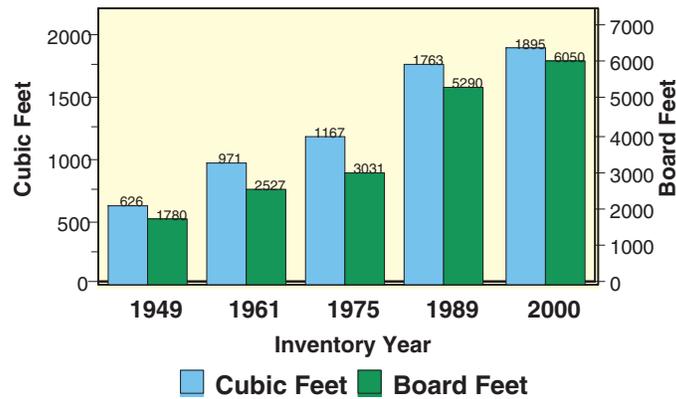
The volume of wood in West Virginia's forests has continued to increase. Foresters calculate the growing-stock volume in the bole of trees between a 1-foot stump and a 4-inch top diameter in terms of cubic feet of wood; the portion of volume that can be sawn into lumber is calculated in board feet. During the most recent inventory period, growing-stock volume increased by 6.5 percent to 22.4 billion cubic feet, and the portion suitable for sawlogs increased by 14 percent to 71.4 billion board feet. Ninety-four percent of the volume is in hardwood species. The hardwood sawlog volume in West Virginia ranks second nationally—only Pennsylvania has more. The increase in board-foot volume was larger because volume increases were concentrated on larger, sawtimber-size trees. The volume of trees in the 6-, 8-, and 10-inch diameter classes decreased, while volume increased in all diameter classes larger than 10 inches.

GROWING-STOCK VOLUME BY DIAMETER CLASS



Average growing-stock volume per acre is now triple that in 1949, increasing from 626 cubic feet in 1949 to 1,895 cubic feet in 2000. The increases in tree size and volume represent a tremendous increase in the value of the forest resource for timber products. During this latest period, on average there were 146 trees per acre 5 inches or larger in diameter (at 4-1/2 feet above the ground) with an average diameter of 9.7 inches.

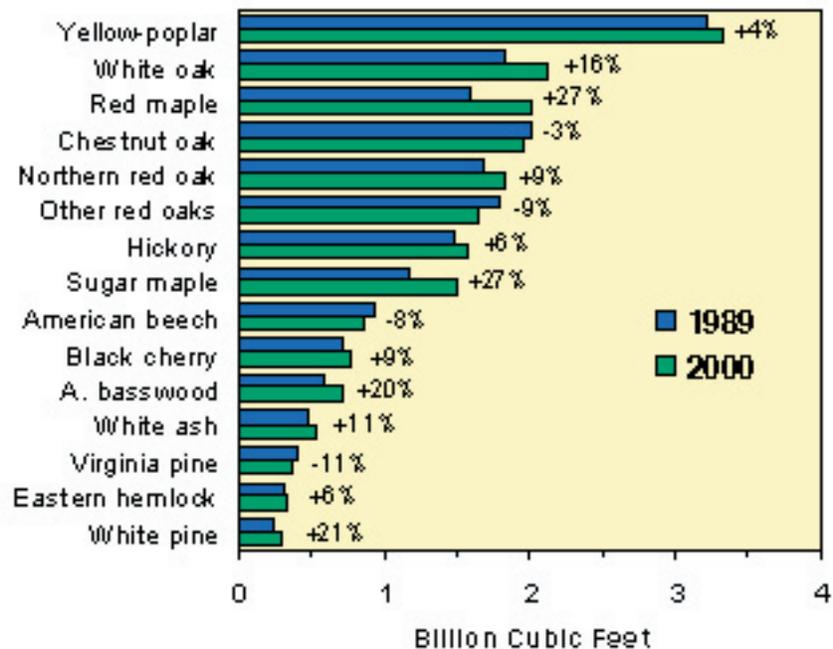
AVERAGE VOLUME PER ACRE



YELLOW-POPLAR LEADS IN VOLUME

West Virginia's forests contain a rich mix of tree species. The 2000 inventory encountered over 100 different tree species, though many are uncommon. The 15 most common species and species groups account for nearly 84 percent of total cubic-foot volume. Yellow-poplar leads in volume followed by white oak and red maple. Red maple and sugar maple had the largest increase in volume, (27 percent each). Mortality caused by the gypsy moth caterpillar contributed to declines in the chestnut oak and the other red oak (mostly black and scarlet oak) species groups. The decline in American beech likely was caused by beech bark disease. Virginia pine is adapted to grow in forests in which wildfires are frequent. This pioneer species declines in importance as fires are controlled and the shady conditions of a mature forest prevail.

CHANGE IN VOLUME OF TOP SPECIES

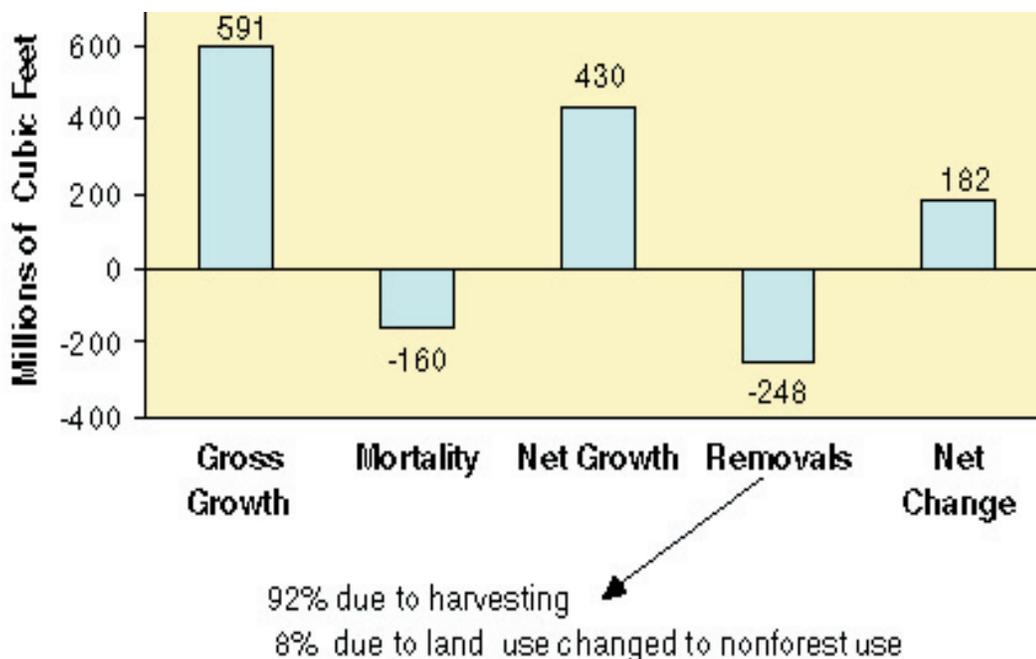


GROWTH EXCEEDS REMOVALS

During the last 50 years in West Virginia, the growth of trees has outpaced removals. The most recent inventory revealed that since 1989, on an annual basis, net growth of trees averaged 430 million cubic feet while removals averaged 248 million cubic feet. This surplus of growth has meant an annual net increase of 182 million cubic feet of wood on the State's timberland. Ninety-two percent of removals are attributed to harvesting and 8 percent to timberland converted to nonforest use. Oaks accounted for nearly 50 percent of the total volume removed. Today, the sawlog component of annual removals is nearly 1 billion board feet or twice the amount in 1989.

Fire, wind, insects, and diseases are among the factors that contribute to tree mortality. In West Virginia, average annual mortality was 160 million cubic feet or 0.7 percent of the inventory volume. This rate is similar to those for neighboring states and is considered normal. Species with high rates of mortality were Virginia pine 4.0 percent, American beech (1.3), and chestnut oak (0.8). Today, on average, there are 14 standing dead trees per acre that are 5 inches or larger in diameter; 83 percent of these are 5 to 12 inches in diameter.

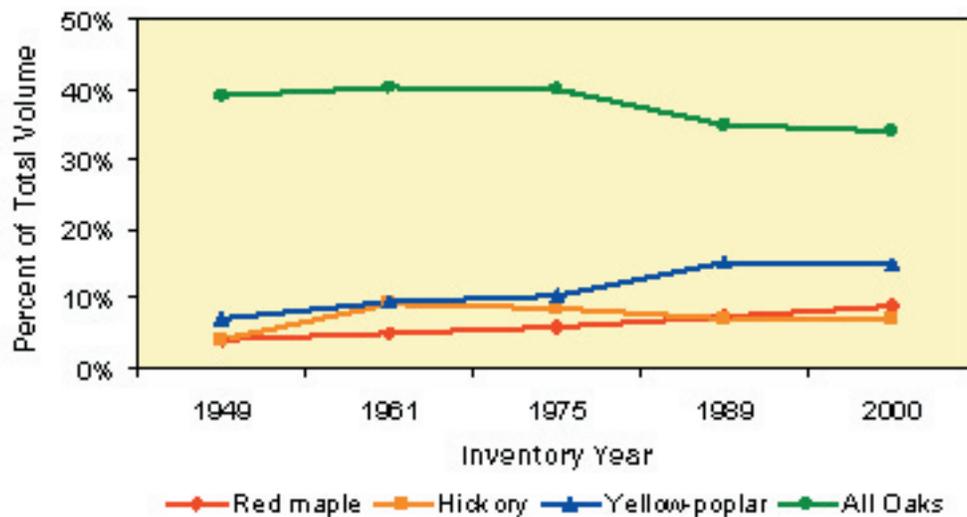
AVERAGE ANNUAL CHANGE IN VOLUME
ON TIMBERLAND 1989-2000



FOREST COMPOSITION IS CHANGING

Over long periods of time, the composition of forests changes because of the effects of mortality, harvesting, and general maturation. Combined oak species in West Virginia now represent 34 percent of total volume compared to 39 percent in 1949. During this period, the portion of total volume in yellow-poplar increased from 7 to 15 percent, and red maple increased from 4 to 9 percent. The decrease in the proportion of oak has been attributed to the high mortality of this species following gypsy moth infestations and selective harvesting of oak over other species. Deer browsing also has contributed to the reduced oak component throughout the forests of the Northeastern United States. Long-term changes in forest composition affect the value of the forest for timber products and can alter wildlife habitats. The decline in the oak component of forests in Pennsylvania and Maryland has been greater than that found in West Virginia.

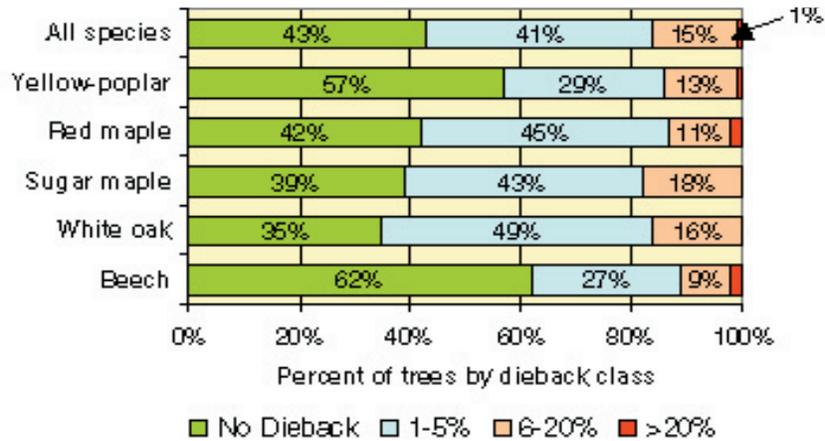
CHANGE IN FOREST COMPOSITION



FOREST HEALTH

Scientists with the Forest Service's Forest Health Monitoring (FHM) Program are studying numerous indicators that reflect forest conditions. One of these is crown dieback, or the percentage of branch tips that are dead. Dieback can be a sign that a tree is being attacked by an insect or disease, or has other health problems. As trees grow and stands become more crowded, dieback can occur among weaker, less competitive trees. Fortunately, few forest trees in West Virginia had a significant amount of crown dieback: 84 percent had 0 to 5 percent and only 1 percent had more than 20 percent. Differences in dieback among species might indicate differences in tree vigor, though some variation should be expected among those with different growth characteristics. Over time, observations of dieback and similar attributes will allow FHM researchers to identify trends and better evaluate forest conditions in West Virginia and elsewhere.

DIEBACK OF TREES MEASURED, 1999-2002



CONCERNS AND OBSERVATIONS

Unlike coal, oil, gas, and other natural resources, forests are renewable. West Virginia's forests were heavily cut between 1880 and 1920 and again during World War II. Inventory data from 1949 to the present record the remarkable widescale recovery of West Virginia's forests. The Mountain State's forests are maturing, as indicated by the increases in the size and volume of trees. And these improvements have occurred despite a nearly doubling of the timber harvest since 1989. Evaluations of forest conditions show that the health of the West Virginia's forests is good despite concerns related to introduced forest insects and diseases such as the gypsy moth and beech bark disease. Today, West Virginia's forests are playing an increasingly important role in the State's growing economy.

The steady improvement of West Virginia's forests will become more difficult to maintain in the future. Forests are under increasing pressure not just to produce timber products, but also from increasing demand for recreation, vacation homes, mining, and other development. Our challenge is to manage West Virginia's forests to meet present demand without jeopardizing the long-term sustainability and health of this valuable resource.

For more information contact: Forest Inventory & Analysis (610) 557-4051, or write: USDA Forest Service, FIA Unit, 11 Campus Boulevard, Suite 200, Newtown Square, PA 19073-3294. Website <http://www.fs.fed.us/ne/fia/>

Or write: West Virginia Bureau of Commerce, Division of Forestry, 1900 Kanawha Boulevard, East, Charleston, WV 25305; or call (304) 558-2788; website: <http://www.wvforestry.com>

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