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# TRENDS IN MARYLAND'S FORESTS

Forest Service

Northeastern  
Research Station

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of Natural Resources  
Forest Service

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# MARYLAND'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. The forests of Maryland contribute greatly to the quality of life of the State's residents, making the Old Line State a better place in which to live. Data in this brochure are from reports published by the USDA Forest Service, which periodically inventories the forests of all 50 states. In cooperation with the Maryland Department of Natural Resources, the Northeastern Research Station completed the fifth statewide inventory of Maryland's forest resource in 1999.

## DECLINES IN FOREST-LAND AREA CONTINUE

Forests cover 41 percent of Maryland, or 2.6 million acres. This amount of forest cover is remarkable in a state that has seen tremendous population growth and economic development in recent years. There are three reasons for this high percentage of forested land. First, most of the population has been concentrated in and around Baltimore and Washington D.C., and a few other cities, leaving much of the state fairly rural. Second, there has been a sizable decrease in the amount of land used for farming. Land in farms is now half of what it was in 1950 a loss of 2.1 million acres. Although much of the lost farmland has been developed, some of it has been abandoned and has reverted to forest land through natural regeneration and tree planting. These new forests have offset much of the losses in forest land due to development. Third, Maryland forests have been conserved and protected by various public programs such as Program Open Space, the Forest Conservation Act (FCA), and the Smart Growth and Rural Legacy Programs. If future growth is managed wisely, some of the negative impacts of urban sprawl will be minimized. Yet, despite these efforts, declines in forestland area have occurred and are likely to continue in the future, as development pressures increase on forest as well as farmland.

### TRENDS IN FOREST-LAND AREA

(Thousands of acres at each inventory)

	Inventory date				
	1950	1964	1976	1986	1999
Timberland	2,897	2,885	2,543.7	2,522.2	2,371.9
Noncommercial forest land	23	78	109.5	123.2	193.9
Total forest land	2,920	2,963	2,653.2	2,645.3	2,565.8
Percent forested	46.2%	46.9%	41.9%	42.3%	41.0%
Estimated total land area*	6,324	6,319	6,330.2	6,255.8	6,255.8

\*Estimates of the total land area have changed because of new measurement techniques and refinements in the classification of small bodies of water.

The 1999 forest inventory reported that forest land in Maryland decreased by 79,500 acres since the previous inventory in 1986. The area in forest has been declining since the 1960's.

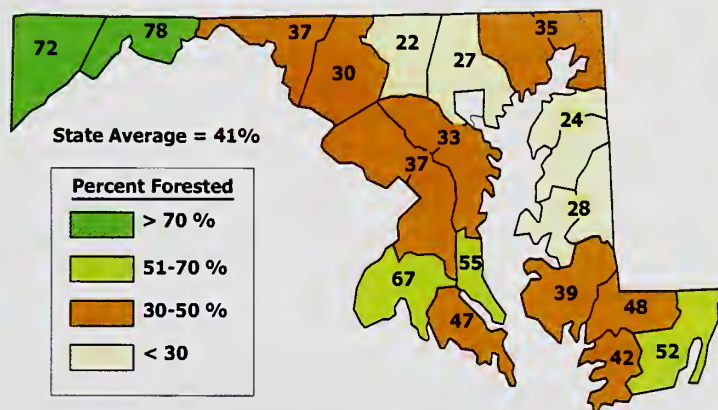
Forest land is categorized by the Forest Service as either timberland or noncommercial forest land. These categories aid in understanding the availability of forest resources and forest management planning. Ninety-two percent of forest land (2,371,900 acres) is classified as timberland that is potentially available for harvesting, though some of this is in areas not

generally thought of as producing timber. The amount of area in timberland has been declining steadily since 1950.

The noncommercial forest land category includes reserved forest lands and unproductive forests. Harvesting for timber products on these lands is administratively restricted or economically impractical. Examples include parks, wildlife preserves, and wetlands with poor growing conditions. Most noncommercial forest land is owned by public agencies and has steadily increased in area from 23,000 acres in 1950 to 193,900 acres in 1999. Nearly all of this increase is due to the reclassification of timberland into this category.

Forest land is not distributed evenly across the state. Allegany County is the most heavily forested county (78 percent); Kent and Queen Annes are the least forested, together averaging only 24 percent.

### PERCENTAGE OF LAND IN FOREST, BY COUNTY, 1999



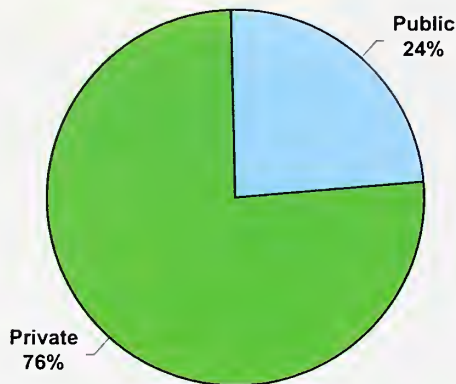
Values on county boundaries denote an average for the two counties.

## PEOPLE AND FORESTS

The size of the population and how people live on the land are significant forces in shaping the forest. The Nation's fifth most densely populated state with 5.3 million people, Maryland has seen its population more than double since 1950. As mentioned earlier, despite the State's high degree of urbanization, large areas of natural vegetation remain in Maryland in part because the population is not equally distributed. However, this is changing as development increases throughout the state.

Seventy-six percent of the State's forest land is owned by an estimated 130,600 private individuals and enterprises; federal, state, and other public owners hold the remaining 24 percent.

## OWNERSHIP OF FOREST LAND IN MARYLAND



Wildlife biologists have discovered that breaking up large tracts of continuous forest into many smaller patches to accommodate roads, housing construction, and other development activities has a detrimental effect on many species of birds and other wildlife. In Maryland, the number of landowners who hold fewer than 10 acres of timberland increased by 62 percent from 1977 to 1989. These small holdings account for 11 percent of the State's private timberland. Unlike owners of large tracts, owners of small woodlots are less likely to manage their forests or allow access to their land for activities such as hunting and fishing.

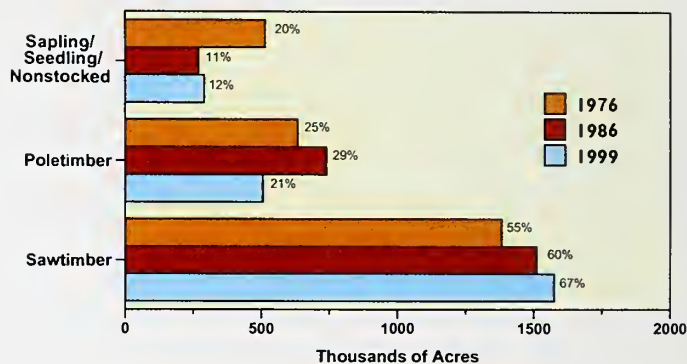
## FORESTS ARE MATURING WITH FEWER STANDS OF YOUNG TREES

Timberland is classified by the size of the trees growing on it. In Maryland, stands in which most of the stocking is in large trees suitable for sawlogs have increased in acreage since the last forest inventory of the State. These stands, which today grow on two-thirds of the timberland have many attributes that benefit wildlife: an understory with herbaceous plants and shrubs that provides food and cover, bole cavities and bark flaps for nesting and feeding sites, respectively, and large, dead trees, both standing and on the forest floor. Also, people enjoy activities such as hiking and camping in stands dominated by large trees because they find them attractive and aesthetically pleasing. Such benefits from these stands should increase as they continue to mature.

In Maryland, about 20 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 often form dense overstories that inhibit the growth of understory vegetation.

Stands classified as sapling-seedling and nonstocked decreased from 20 percent of timberland in 1976 to 12 percent in 1999. Typically found in such stands are early successional, pioneer tree species as well as a variety of herbaceous and shrub plants that need full sunlight to survive. These stands provide unique nesting and feeding opportunities for wildlife. Besides offering diverse habitat for wildlife and providing a steady flow of wood products, forests that contain all stand-size classes might be more resistant to devastating outbreaks of insects and diseases.

## TIMBERLAND AREA BY STAND-SIZE CLASS AND PERCENT OF TOTAL BY INVENTORY YEAR



## THE VOLUME OF TREES HAS INCREASED

Maryland's forests now contain more large trees with increased volume. Foresters calculate the volume in the boles of trees between a 1-foot stump and a 4-inch top diameter in terms of cubic feet of wood. Average tree volume per acre increased from 964 cubic feet in 1950 to 2,194 cubic feet in 1999. During the most recent inventory period, growing-stock volume increased by 7 percent, with the portion suitable for sawlogs increasing by 14 percent to 16.2 billion board feet. Also during this period, the average number of trees per acre that are 5 inches or more in diameter (at 4-1/2 feet above the ground) has remained unchanged at 159, though average diameter has increased from 9.3 to 9.6 inches.

## AVERAGE VOLUME PER ACRE

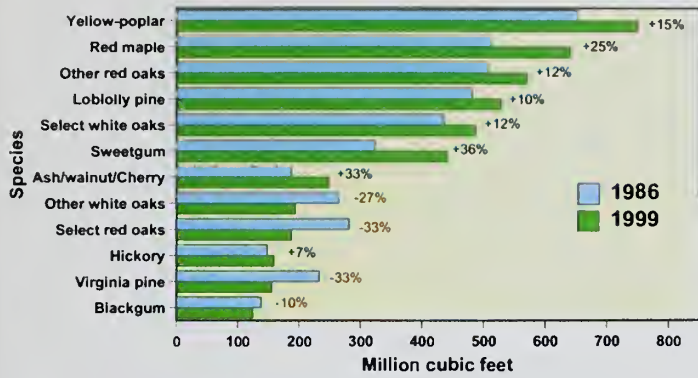


\* 80 cubic feet of solid wood is equal to approximately 1 cord

## YELLOW-POPLAR LEADS IN VOLUME

Maryland's forests contain a rich mix of species. The 1999 inventory identified 94 tree species, though many of these are uncommon. The 12 most common species and species groups (listed in the following chart) account for 88 percent of total cubic-foot volume. Yellow-poplar leads in volume followed closely by red maple.

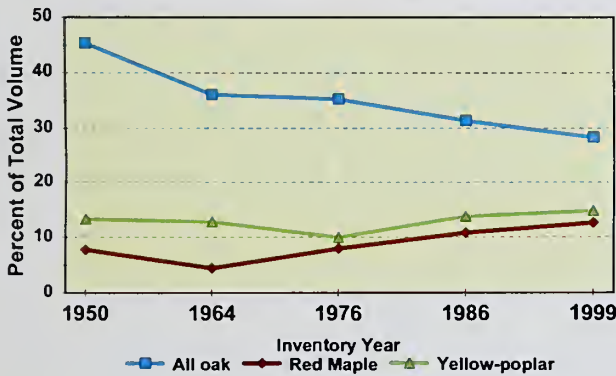
## CHANGE IN VOLUME OF TOP SPECIES



## FOREST COMPOSITION IS CHANGING

Combined oak species represent 28 percent of total volume, down from 45 percent in 1950. The portion of total volume in red maple increased from 8 to 13 percent from 1950 to 1999. The decrease in the proportion of oak has been attributed to many factors, among them; the high mortality of oak species following gypsy moth infestations, deficits in oak reproduction due to deer browsing, and selective harvests of oak over other species.

### CHANGE IN FOREST COMPOSITION



## GROWTH EXCEEDS REMOVAL

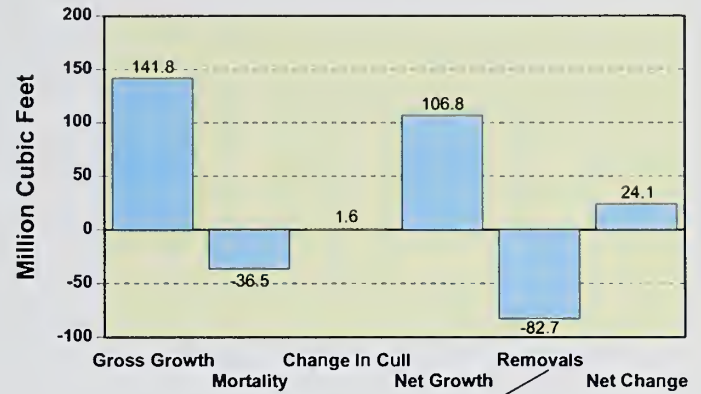
During the last 50 years in Maryland, the growth of trees has outpaced removals by a wide margin. The most recent inventory revealed that since 1986, on an annual basis, the net growth of trees averaged 108 million cubic feet while removals averaged 82.7 million cubic feet. This surplus of growth has meant an annual net increase of 0.2 percent in the volume of wood on the State's timberland. Sixty-three percent of removals are attributed to harvesting; 28 percent is attributed to volume on timberland reclassified to noncommercial forest land; and 9 percent to the volume of wood on timberland converted to nonforest uses. Oaks accounted for 36 percent of the total volume removed.

Fire, wind, insects, and diseases are among the factors that contribute to tree mortality. In Maryland, average annual mortality was 36.5 million cubic feet or 0.7 percent of the inventory volume. This rate is similar to those for neighboring states and is considered normal. Today, on average, there are 15 standing dead trees per acre of timberland; 80 percent of these are 5 to 12 inches in diameter.

## COMPONENTS OF VOLUME CHANGE, 1987-99

$$\text{Gross Growth} - \text{Mortality} \pm \text{Change in cull} = \text{Net Growth}$$

$$\text{Net Growth} - \text{Removals} = \text{Net Change}$$

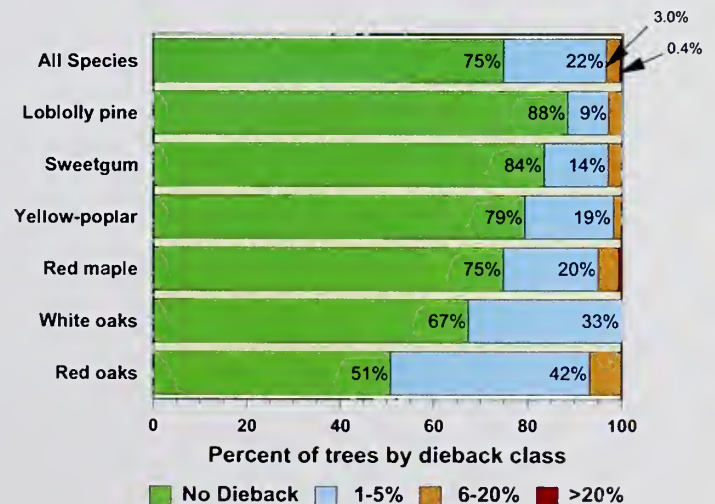


63% due to harvest  
28% due to land use changed to noncommercial  
9% due to land use changed to nonforest

## FOREST HEALTH

The USDA Forest Service's Forest Health Monitoring (FHM) Program looks at a wide set of indicators that reflect forest conditions. One of these measures is crown dieback, or the percentage of branch tips that are dead. Dieback can be a sign that the tree is being attacked by an insect or disease, or has other health problems. Also, as trees grow and stands become more crowded, the weaker, less competitive trees experience dieback. Fortunately, few forest trees in Maryland had a significant amount of crown dieback: 97 percent had little (1 to 5 percent) or no dieback and only 0.4 percent had dieback greater than 20 percent. Differences in dieback among species might indicate differences in tree vigor, though some variation should be expected among species 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 Maryland and elsewhere.

### DIEBACK OF TREES MEASURE, 1996-99



## CONCERNS AND OBSERVATIONS

The period from 1950 to the present has been remarkable for the wide-scale growth of Maryland's forests and for the amount of land that has remained in forest despite increasing economic development. The State's forests are maturing, as shown by the increases in stand size and volume of trees per acre. Overall evaluations of forest conditions show that the health of Maryland's forests is good despite concerns related to introduced forest insect pests such as gypsy moth and invasive, exotic plants such as Norway maple and tree-of-heaven (*Ailanthus*).

Forest values often are difficult to discern and the adverse effects of degradation are seldom immediately evident. As the dynamics of forests are better understood, the importance of Maryland's forests to its inhabitants will only increase. The challenge for the future is to protect this valuable forest resource from the pressures of a growing population and from introduced pests and diseases, and invasive plants, while ensuring the continued delivery of the many goods and services that Maryland residents have come to expect from the State's forest land.

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: Maryland Department of Natural Resources Forest Service, Tawes State Office Building, 580 Taylor Ave., Annapolis, Maryland 21401-2397 ; or call (410) 260-8531. Website: <http://www.dnr.state.md.us/forests/>

Brochure written by Richard H. Widmann, USDA, FIA Unit, Newtown Square, PA 19073-3294

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