



United States
Department of
Agriculture

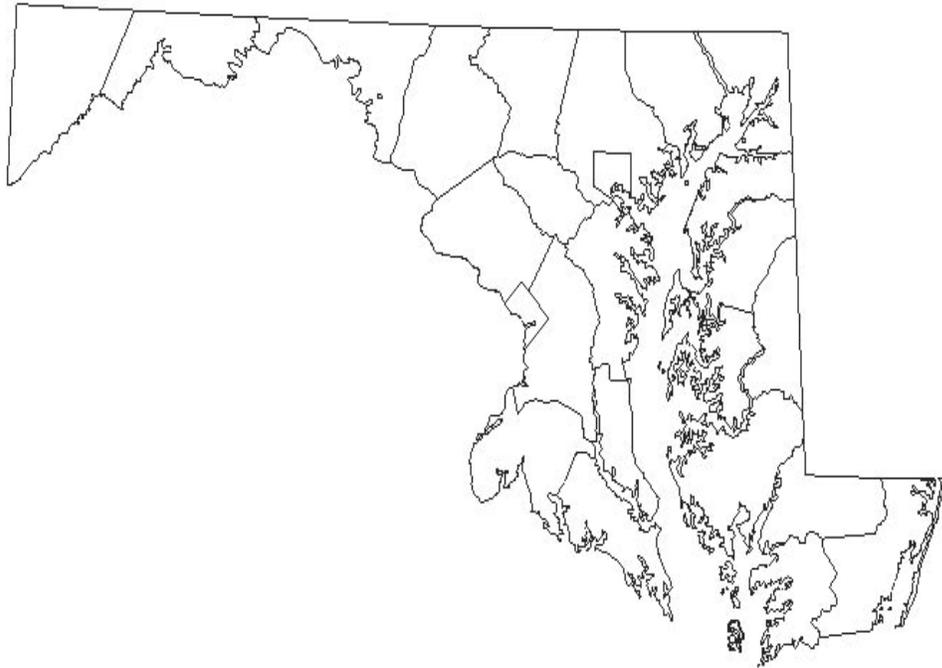
Forest Service

**Northeastern
Research Station**

NE-INF-160-03



Forest Health Monitoring in Maryland 1996-1999



MARYLAND

The National Forest Health Monitoring (FHM) program monitors the long-term status, changes and trends in the health of forest ecosystems and is conducted in cooperation with individual states.

In Maryland, 40 FHM plots were established in 1991 (Fig. 1). Beginning in 1998, 95 plots were added. Each point in Figure 1 represents the status and approximate location of one FHM plot. Each plot is a series of four fixed-area circular plots. Most tree measurements are made on four 1/24-acre subplots. Seedling and sapling measurements are made on four 1/300-acre microplots, located within the subplots.

From 1996 to 1999, all 135 plots in Maryland were visited at least once. This report summarizes the most recent conditions.

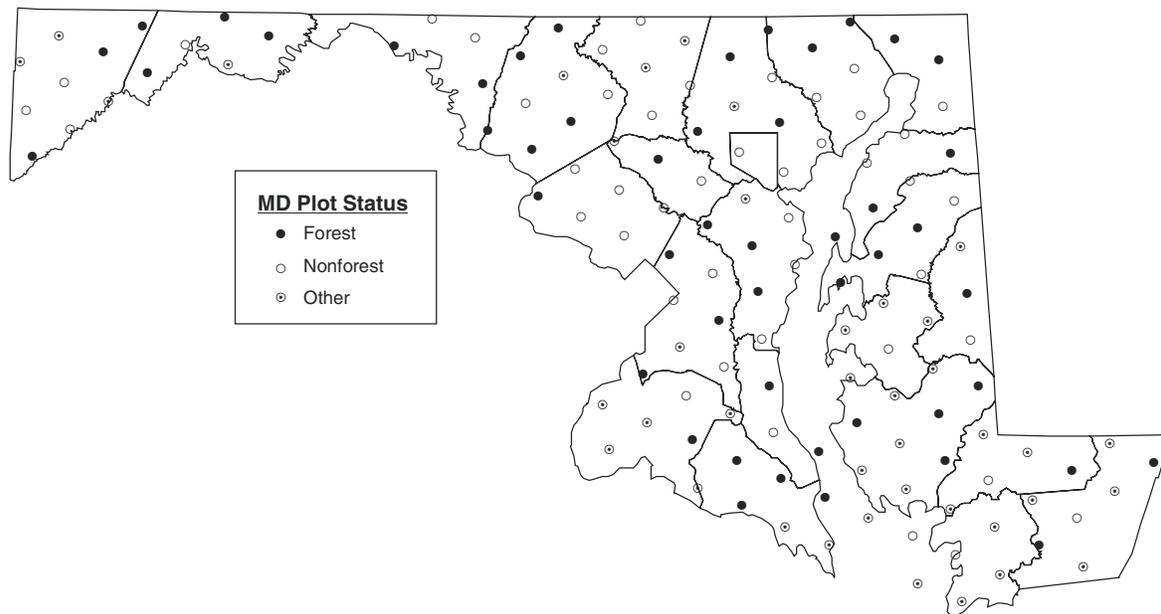


Figure 1. – Current status and approximate locations of Forest Health Monitoring (FHM) plots in Maryland.

Plot Characteristics

- 50 of the 135 plots were at least partially forested.
- 30 percent of the 135-plot area was forested.
- 59 percent of the forested areas were of the oak-hickory forest types. Maple-beech-birch and oak-gum-cypress forest types each accounted for about 13 percent of the forested areas.
- 82 percent of the forested areas were in sawtimber-size stands; 12 percent of the forested areas were in poletimber-size stands.
- 42 percent of the forested areas were in stands that were more than 60 years old; 41 percent of the areas were in stands that were 41 to 60 years old.

Plot Structure (Table 1)

Seedlings

- Red maple and yellow-poplar seedlings (12 inches tall, less than 1 inch diameter) were most abundant, each species accounting for about 12 percent of the 1,079 seedlings counted.
- The five most abundant species groups collectively accounted for 40 percent of the seedlings. They were red maple, yellow-poplar, pawpaw, American beech, and other (non-select) white oak.

Saplings

- Red maple saplings (1 to 4.9 inches diameter at breast height, d.b.h.) were the most abundant, accounting for over 25 percent of the 231 saplings counted.
- The five most abundant species groups collectively accounted for 58 percent of the saplings. They were red maple, tupelo/blackgum, sweetgum, dogwood, and American holly.

Trees

- Red maple trees (5 inches d.b.h. or greater) were the most abundant, accounting for 16 percent of the 965 trees counted.
- The six most common species groups collectively accounted for 59 percent of the trees. They were red maple, yellow-poplar, sweetgum, southern yellow pine, other (non-select) white oak, and tupelo/blackgum.

Table 1. -- Numbers of trees by size class, and species groups, Maryland, 1996-99. Rankings of species quantity appear as superscripts beside numbers.

Species	Size Class		
	Seedlings	Saplings	Trees
Southern yellow pine	5	5	92 ⁴
American beech	51 ⁴	5	28
Black cherry	40	12 ⁵	47
Dogwood	16	13 ⁴	6
Red maple	130 ¹	59 ¹	159 ¹
Other white oak	50 ⁵	5	52 ⁵
Pawpaw	77 ³	4	-
Sweetgum	47	21 ³	103 ³
Tupelo/Blackgum	26	26 ²	52 ⁵
Yellow-poplar	126 ²	9	112 ²
All softwoods	7	5	102
All hardwoods	1,072	226	863
All trees	1,079	231	965

Tree Condition

Crown Dieback (Table 2; Fig. 2)

Crown dieback refers to recent mortality of branches with fine twigs and is measured as a percentage of the tree crown. Low dieback ratings (5 percent or less) are considered to be an indicator of good health. High dieback ratings indicate poor health.

- 96 percent of the trees had low dieback ratings; average dieback was 2 percent.
- Less than 1 percent of the trees had high dieback ratings (more than 20 percent affected crown).

Table 2. -- Mean plot values and percentage of trees with ratings of specified values, by crown variable, Maryland, 1996-99. (plot means based on 49 forested plots; percentage of trees based on 965 live trees 5 in. or more in d.b.h.)

		Value
<u>Crown Dieback</u>		
	Plot Mean	1.8%
	Trees with $\leq 5\%$ dieback	96
<u>Foliage Transparency</u>		
	Plot Mean	15.9%
	Trees with $\leq 30\%$ transparency	98
<u>Crown Density</u>		
	Plot Mean	50.9%
	Trees with $>30\%$ density	94

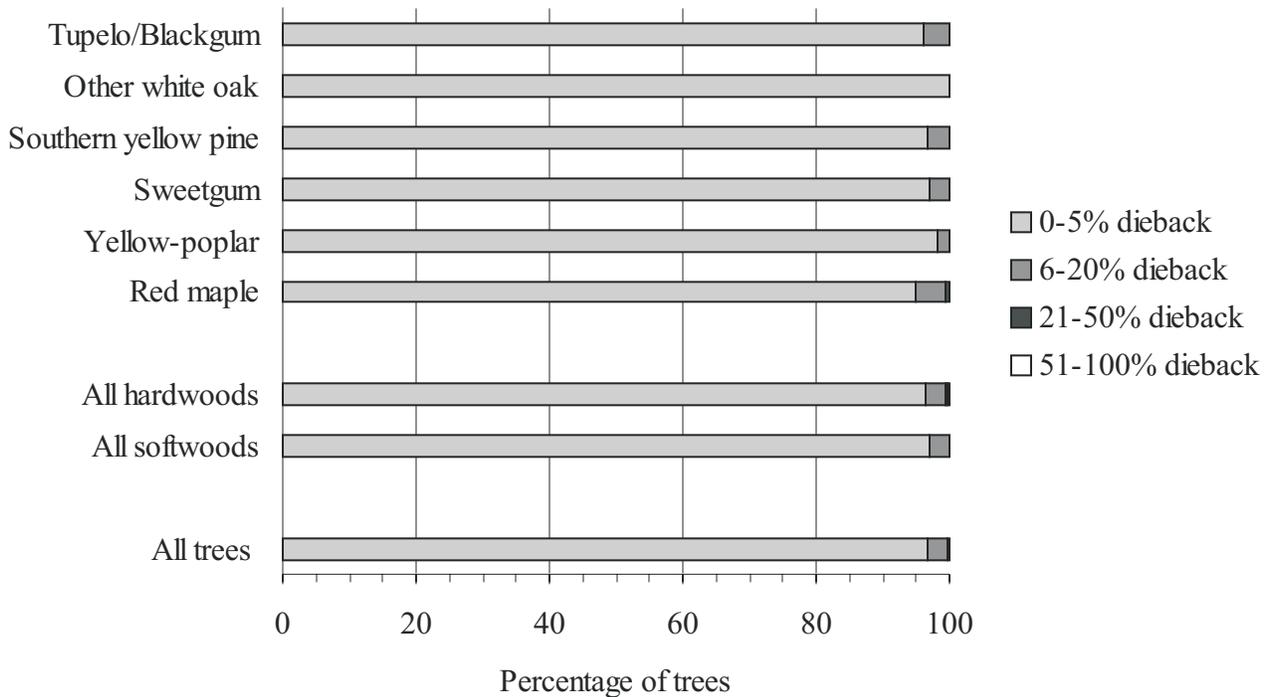


Figure 2. – Distribution of crown dieback ratings for trees in Maryland, 1996-99.

Foliage Transparency (Table 2; Fig. 3)

Foliage transparency is the amount of skylight visible through the live, normally foliated portion of the crown. Foliage transparency estimates the crown condition in relation to a typical tree for the site where it is found. Low transparency ratings (little visible skylight) indicate a full and generally healthy crown; high transparency ratings indicate a sparse crown. Transparency ratings of 30 percent or less are considered normal for most trees.

- 98 percent of all trees and 92 percent of common species had normal transparency ratings; average transparency was 16 percent.
- Transparency ratings were high (more than 30 percent) on 5 percent of the southern yellow pines.

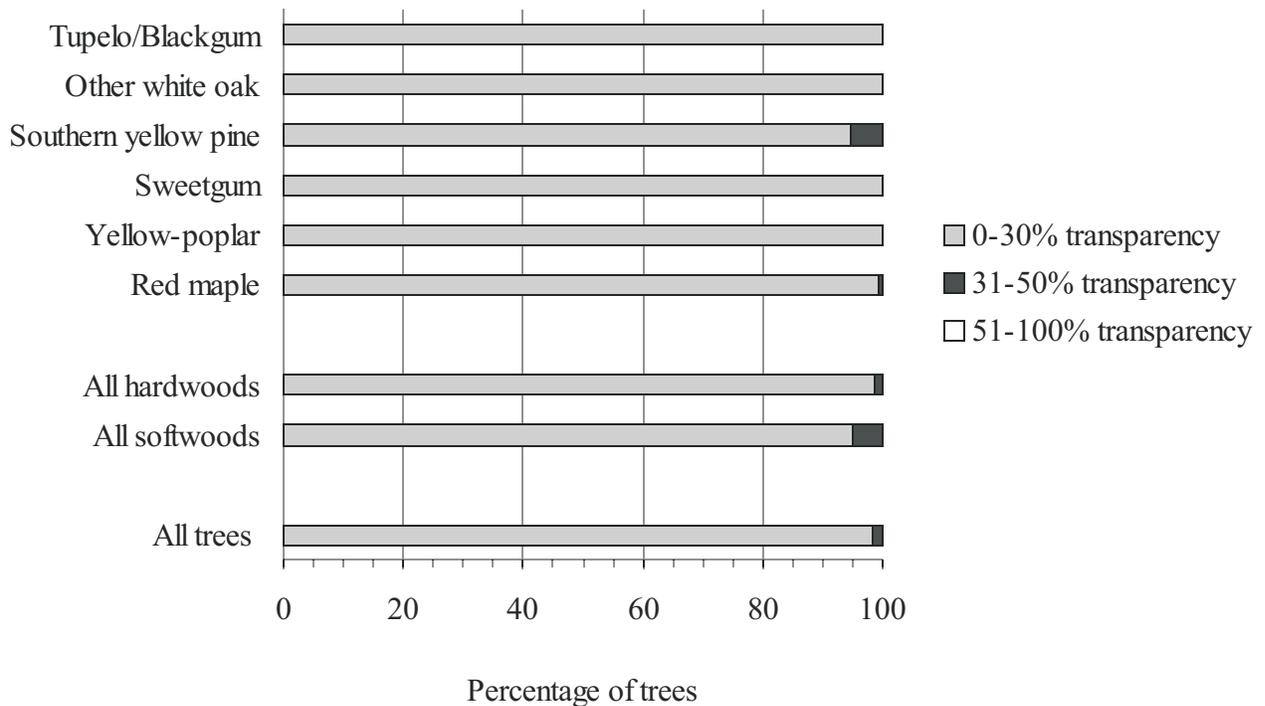


Figure 3. – Distribution of foliage transparency ratings for trees in Maryland, 1996-99.

Crown Density (Table 2; Fig. 4)

Crown density is the percentage of crown area where sunlight is blocked by crown branches, foliage, and reproductive structures. Crown density estimates crown condition relative to a typical tree for the site. Density also serves as an indicator of future growth. High density ratings (greater than 30 percent) indicate a full, healthy, crown.

- 94 percent of trees had high density ratings; average crown density was 51 percent.
- Only 2 percent of other (non-select) white oak trees had low density ratings.

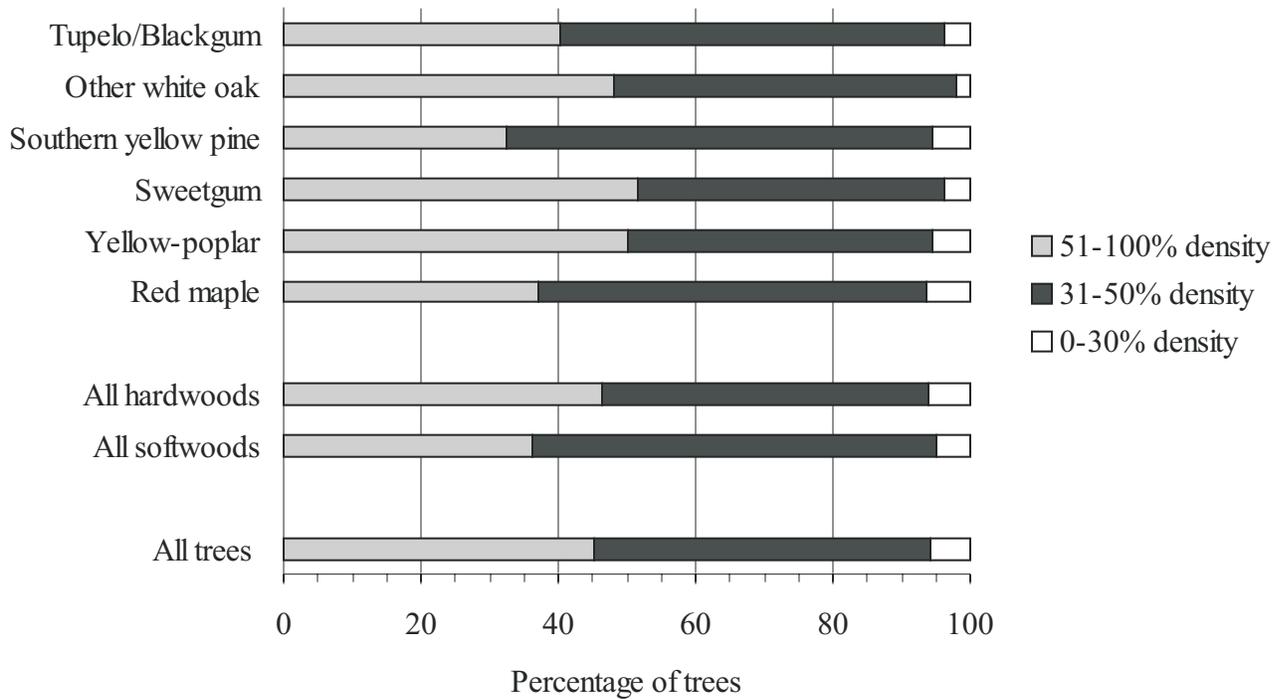


Figure 4. – Distribution of crown density ratings for trees in Maryland, 1996-99.

Tree Damage

Signs and symptoms of damage were recorded if the damage could kill the tree or affect its long-term survival. The 11 categories of damage used in this report were: cankers and galls, decay, open wounds, resinosis and gummosis, cracks and seams, vines, dead or broken tops, broken branches, other bole and root damage, other crown damage, and other damage (not otherwise defined).

- 72 percent of trees had no significant damage, 21 percent had one damage, and 7 percent of the trees had two or more damages.
- 55 percent of 356 damages were decay; 20 percent were vines in the crowns, and 7 percent were cankers and galls.
- 53 percent of red maple had no significant damages. Of the damages present, 70 percent of the damages due to decay and 12 percent were vines.

Summary

Maryland has mature forests dominated by hardwood species. Most trees are healthy, with full crowns (low transparency, high density), little dieback and little damage. Red maple tends to be more damaged than other trees.

For more information regarding the FHM program, contact: Chuck Barnett
Northeastern Research Station, USDA Forest Service, 11 Campus Blvd, Suite
200, Newtown Square, PA 19073, 610-557-4031, cjbarnett@fs.fed.us, or visit
the National FHM website: www.na.fs.fed.us/spfo/fhm

Acknowledgments

The FHM program thanks the landowners of Maryland and the Maryland Department of Natural Resources for their cooperation and assistance.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.