



Forest Service

**Northeastern
Research Station**

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NEW JERSEY

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 New Jersey, 30 FHM plots were established in 1991 (Fig. 1). Each point in Figure 1 represents the status and approximate location of one FHM plot. Each plot is a set 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.

All plots were visited at least once between 1996 and 1999, and 11 to 13 plots were sampled each year. This report summarizes the most recent conditions.

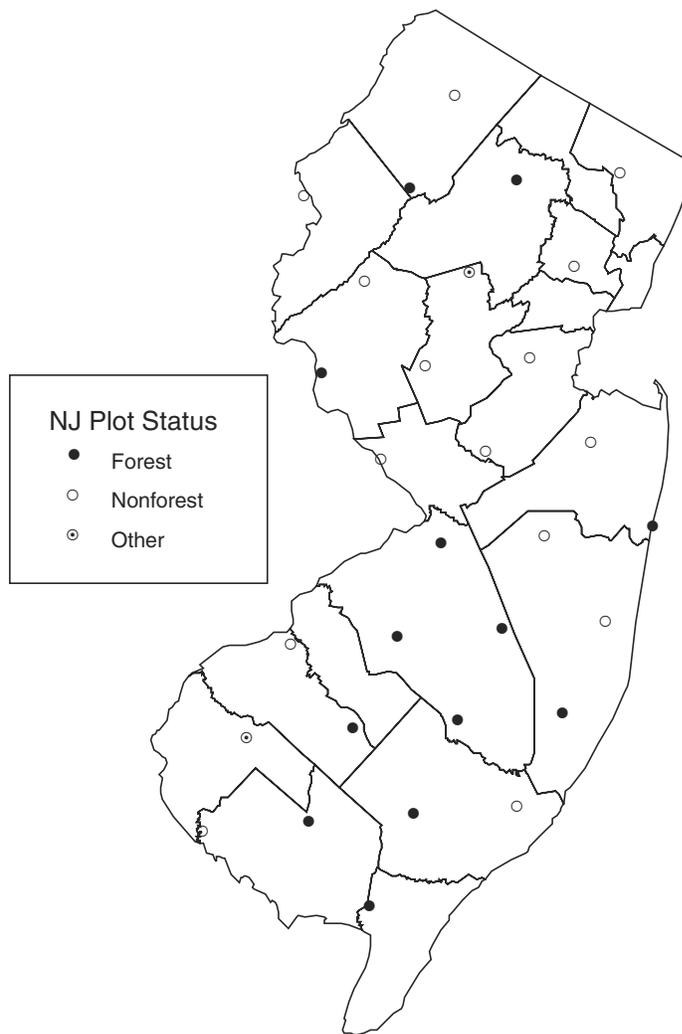


Figure 1.--Current status and approximate locations of Forest Health Monitoring (FHM) plots in New Jersey.

Plot Characteristics

- 13 of the 30 plots were at least partially forested.
- 37 percent of the 30-plot area was forested.
- 29 percent of the forested areas were of the loblolly-shortleaf pine forest types; the second most common groups were the maple-beech-birch and oak-hickory forest type groups, each accounting for about 18 percent of the forested areas. Oak-pine forest types occurred on 11 percent of the forest areas. White-red-jack pine and oak-gum-cypress forest types each occurred on 9 percent of the forested areas.
- 18 percent of the forested areas were in sawtimber-size stands and 76 percent were in poletimber-size stands.
- 62 percent of the forested areas were in stands that were more than 60 years old; 29 percent of the forested areas were in stands that were 41 to 60 years old and 9 percent were in stands 21 to 40 years old.

Plot Structure (Table 1)

Seedlings

- Other red oak seedlings (12 inches tall, less than 1 inch diameter) were most abundant, accounting for about 39 percent of the 285 seedlings counted.
- The five most abundant species groups collectively accounted for over 81 percent of the seedlings. They were other (non-select) red oak, sugar maple, other maple, other (non-select) white oak, and yellow-poplar.

Saplings

- Southern yellow pine saplings (1 to 4.9 inches diameter at breast height, d.b.h.) were the most abundant, accounting for 30 percent of the 57 saplings counted.
- The five most abundant species groups collectively accounted for 82 percent of the saplings. They were southern yellow pine, red maple, other (non-select) red oak, American holly, and select white oak.

Trees

- Southern yellow pine trees (5 inches d.b.h. or greater) were the most abundant, accounting for 33 percent of the 295 trees counted.
- The six most common species groups collectively accounted for 73 percent of the trees. They were southern yellow pine, other (non-select) red oak, select white oak, American holly, red maple, and sassafras.

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

Species	Size Class		
	Seedlings	Saplings	Trees
Southern yellow pine	3	17 ¹	96 ¹
American holly	-	5 ⁴	20 ⁴
Sugar maple	60 ²	-	1
Red maple	1	12 ²	19 ⁵
Other maple	30 ³	-	-
Other red oak	112 ¹	9 ³	35 ²
Select white oak	10	4 ⁵	27 ³
Other white oak	16 ⁴	-	1
Sassafras	6	1	19 ⁵
Yellow-poplar	13 ⁵	-	7
All softwoods	3	17	101
All hardwoods	282	40	194
All trees	285	57	295

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.

- 84 percent of the trees had low dieback ratings; average dieback was 5 percent.
- None 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, New Jersey, 1996-99. (plot averages based on 13 forested plots; percentage of trees based on 295 live trees 5 in. or more in d.b.h.)

	Value
<u>Crown Dieback</u>	
Plot Mean	5.2%
Trees with $\leq 5\%$ dieback	84
<u>Foliage Transparency</u>	
Plot Mean	18.8%
Trees with $\leq 30\%$ transparency	97
<u>Crown Density</u>	
Plot Mean	43.8%
Trees with $>30\%$ density	90

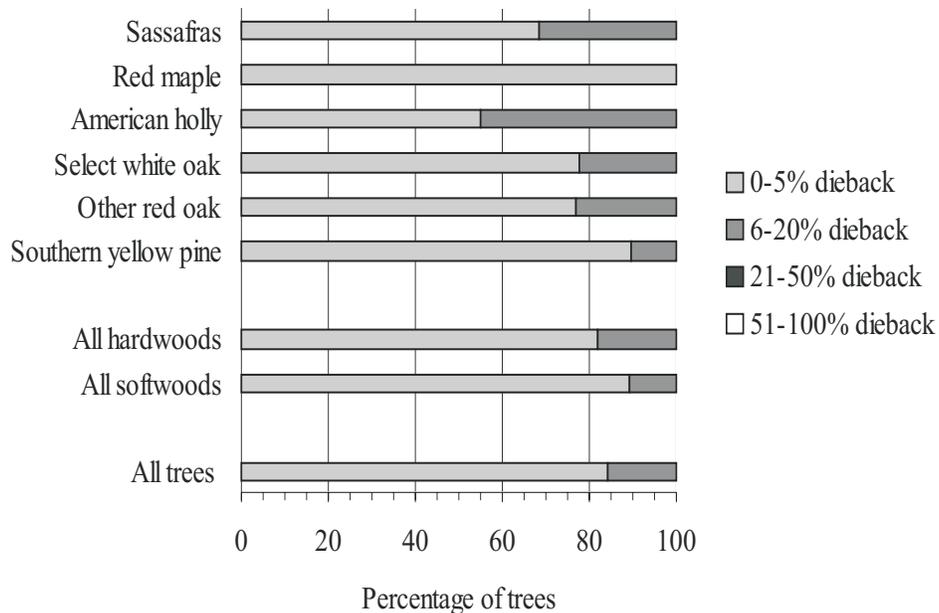


Figure 2.--Distribution of crown dieback ratings for trees in New Jersey, 1996-99.

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.

- 97 percent of all trees had normal transparency ratings; average transparency was 19 percent.
- 7 percent of southern yellow pine had high transparency ratings (more than 30 percent of the crown).

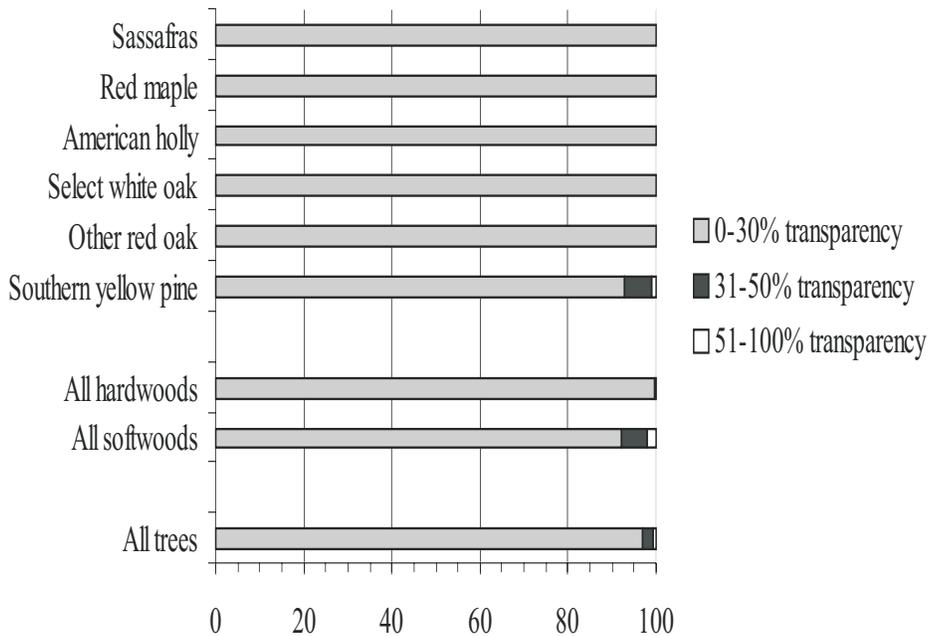


Figure 3.--Distribution of foliage transparency ratings for trees in New Jersey, 1996-99.

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.

- 90 percent of all trees had high density ratings; average crown density was 44 percent.
- 15 percent of southern yellow pine and select white oak had low crown density (30 percent or less).

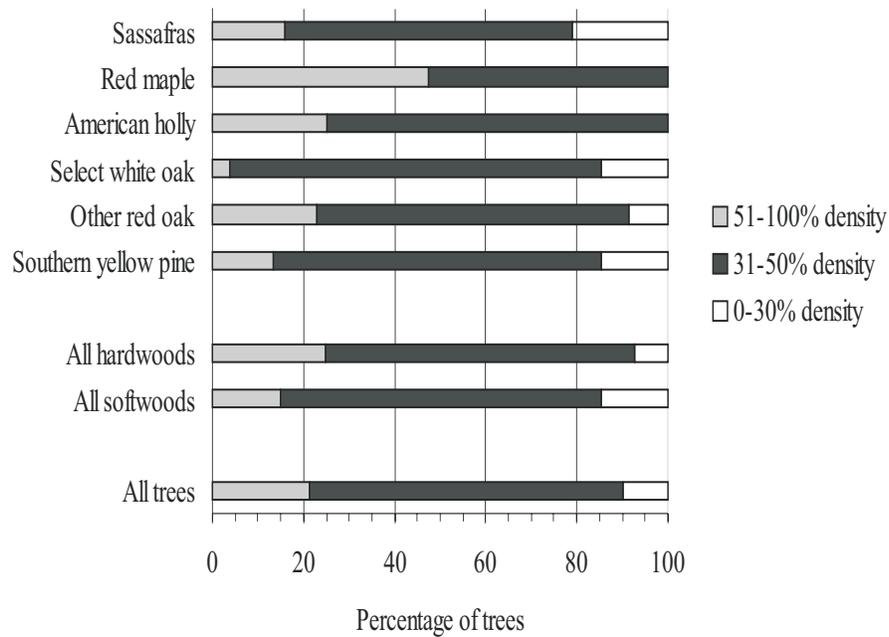


Figure 4.--Distribution of crown density ratings for trees in New Jersey, 1996-99.

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).

- 85 percent of trees had no significant damage, 13 percent had one damage, and 2 percent of the trees had two or more damages.
- 65 percent of 54 damages were decay; 18 percent were dead or broken tops; and 6 percent were vines in the crown.
- Decay was 76 percent of all damage on hardwoods and 30 percent of all damage on softwoods.
- 30 percent of select white oak had at least one damage compared to 15 percent for all trees. More than two-thirds of the damages were decay.

Summary

New Jersey has mature forests, dominated by hardwoods but with significant softwood component, particularly Southern yellow pine. Most of the trees are healthy, with full crowns (low transparency, high density), little dieback and little damage. Southern yellow pine had more trees with thinner crowns. Decay is a bigger problem for hardwoods than for softwoods.

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

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