

Pennsylvania's Forest Resources, 2006

Research Note NRS-25

This publication provides an overview of forest resource attributes for Pennsylvania based on an annual inventory conducted by the Forest Inventory and Analysis program at the Northern Research Station of the U.S. Forest Service (NRS-FIA). These annual estimates, along with web-posted core tables, will be updated annually. For more information regarding past inventory reports for this state, inventory program information, and sampling/estimation procedures, please refer to the citations at the end of this report.

Table 1.—Annual estimates and uncertainty

	Estimate	Sampling Error (%)
Forest Land Estimates		
Area (1,000 acres)	16,599.6	.7
Number of live trees 1-inch diameter or larger (million trees)	8,431.5	1.6
Dry biomass of live trees 1-inch diameter or larger (1,000 tons)	1,093,691.0	1.0
Net volume in live trees (1,000,000 ft ³)	32,897.0	1.2
Net volume of growing-stock trees (1,000,000 ft ³)	31,437.2	1.2
Annual net growth of live trees (1,000 ft ³ /year)	801,677.7	3.9
Annual mortality of live trees (1,000 ft ³ /year)	253,702.5	6.5
Annual removals of live trees (1,000 ft ³ /year)	379,759.5	11.8
Timberland Estimates		
Area (1,000 acres)	16,083.2	.8
Number of live trees 1-inch diameter or larger (million trees)	8,243.7	1.7
Biomass of live trees 1-inch diameter or larger (1,000 tons)	1,059,035.8	1.1
Net volume in live trees (1,000,000 ft ³)	31,866.4	1.2
Net volume of growing-stock trees (1,000,000 ft ³)	30,458.5	1.3
Annual net growth of growing-stock trees (1,000 ft ³ /year)	825,814.1	3.5
Annual mortality of growing-stock trees (1,000 ft ³ /year)	188,481.1	6.8
Annual removals of growing-stock trees (1,000 ft ³ /year)	340,207.1	12.4

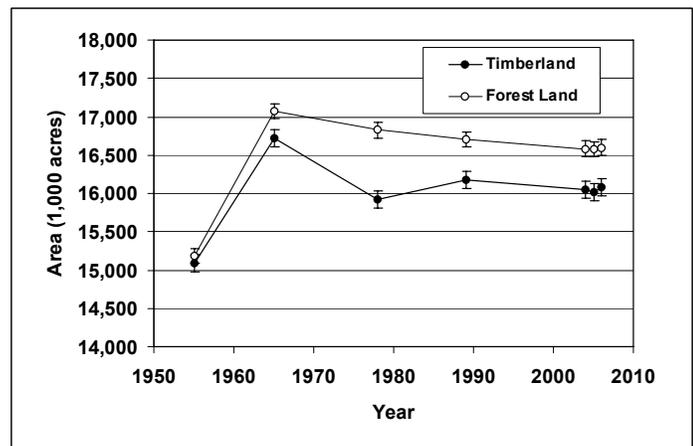


Figure 1.—Area of timberland and forest land by year.

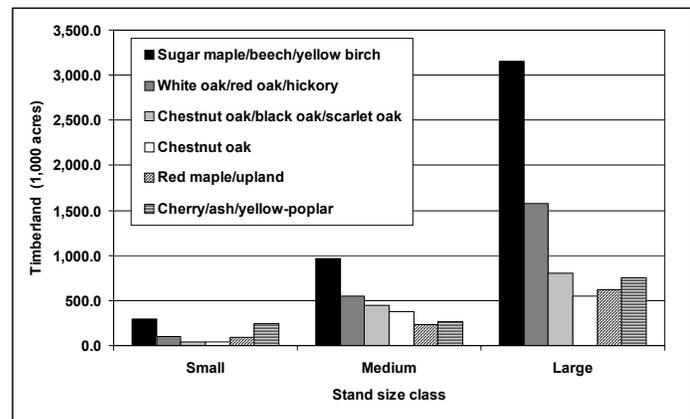


Figure 2.—Area of timberland for top six forest types by stand-size class.

Image credit: Paul Wray, State University, Bowling Green

Table 2.—Volume estimates for the top 10 species based on the volume of live trees

Rank	Species	Volume of live trees on timberland (Million Cubic Feet)	Sampling Error (%)	Volume of sawtimber trees on timberland (Million Board Feet)	Sampling Error (%)
1	Red maple	6,194.7	2.7	14,785.7	3.8
2	Black cherry	3,293.5	4.4	10,440.4	5.8
3	Northern red oak	2,955.0	4.1	11,315.4	4.7
4	Sugar maple	2,403.5	5.0	6,460.2	6.2
5	Chestnut oak	2,213.8	4.3	5,709.8	5.2
6	Eastern hemlock	1,744.3	5.9	5,203.2	7.0
7	White ash	1,486.6	5.6	4,634.3	7.2
8	White oak	1,482.5	5.2	4,624.0	6.3
9	Yellow-poplar	1,369.2	8.1	5,745.0	9.1
10	Black birch	1,323.5	5.0	2,507.9	6.9
	Other softwoods	1,940.3	5.7	5,665.3	6.8
	Other hardwoods	28,667.9	1.9	81,815.5	2.5
	All Species	31,866.5	1.2	91,597.8	1.7

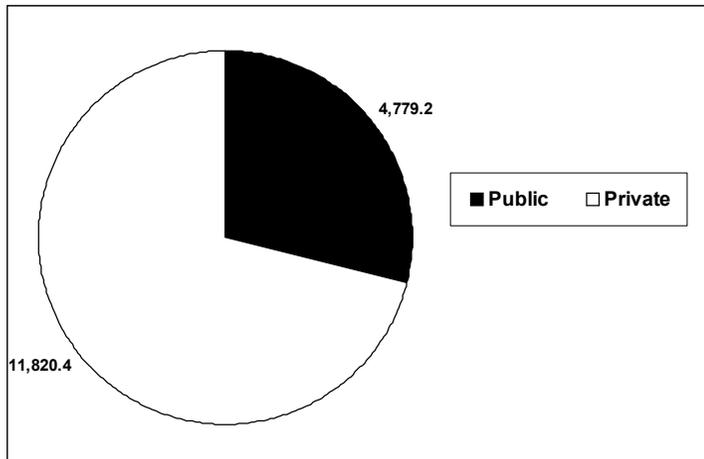


Figure 3.—Area of forest land (1,000 acres) by broad ownership group.

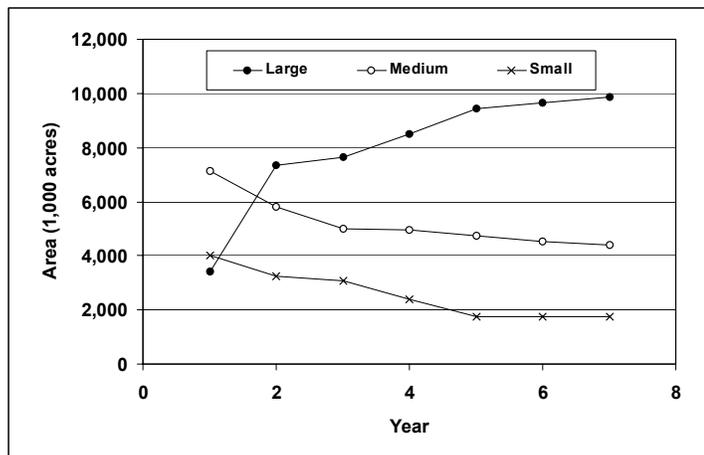


Figure 4.—Area of timberland by stand-size class and year.

Image credit: Paul Wray, State University, Boywood.org

Pennsylvania Issue Update – Need for Full Remeasurement

The major benefit of repeated inventories is the ability to accurately estimate change in resource attributes over time. Of critical importance are inventory change components, or average annual net growth, removals, and mortality. These components measure the resource's ability to expand over time and can be expressed in biomass units, cubic-foot volume, or board-foot volume. As such, change components are perhaps the most fundamental estimates of short-term resource sustainability available from the inventory. Net growth is equal to gross growth minus mortality, or the amount of wood lost due to trees dying since the previous inventory. Removals includes trees that have been harvested and trees on land converted to nonforest uses. Comparing net growth to removals indicates both the direction and magnitude of resource change, e.g., a large positive margin of net growth over removals foretells large gains.

The 2006 resource change components estimates are based on remeasurement of two inventory panels or 40 percent of the forested samples. To date, this level of remeasurement has not provided a level of precision that allows meaningful analysis for all species because of the relatively low percentage of remeasured samples. The sample of mortality and removal trees is particularly small compared to growth.

As illustrated in Figure 5, the relationships between the three change components and their respective sampling errors has varying effects on the analysis of sustainability. For common species, such as soft (red) maple, there appears to be adequate precision to draw substantive conclusions; however, for less common species, such as ash and hickory, the results are less illustrative. The analysis also depends on the level of precision required. Figure 5 shows the results for both 67 and 95 percent levels of confidence. As more inventory panels are remeasured, the ability to assess these aspects of sustainability will improve.

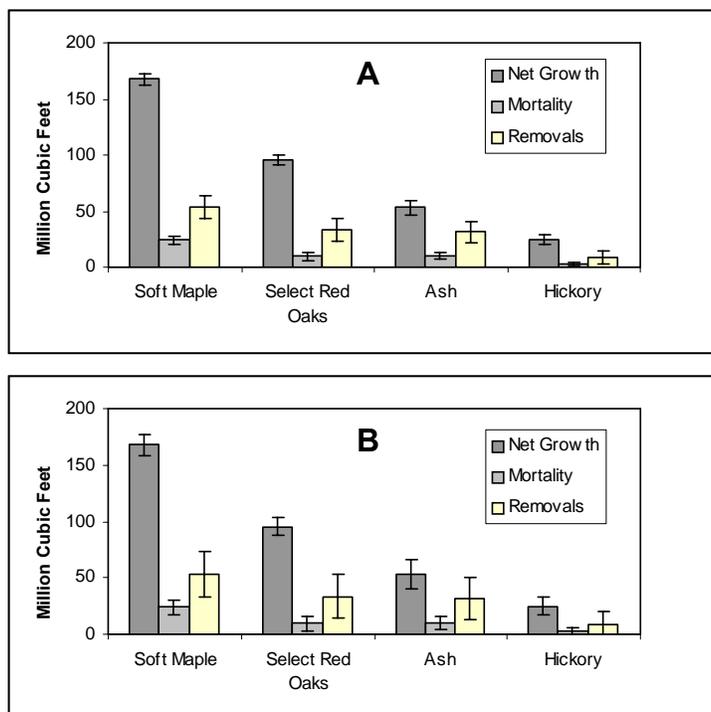


Figure 5.—Average annual net growth, removals, and mortality of growing stock on timberland with 67 percent (A) and 95 percent (B) confidence intervals, 2006.

Citation for this Publication

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FIA Program Information

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Additional Pennsylvania Inventory Information

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