

Highlights

Forest-Land Area

The 3.1 million acres of forest land in the Commonwealth of Massachusetts cover 62 percent of the state's total land area (5 million acres). Timberland, the largest component of forest land, totals 2.6 million acres and makes up 84 percent of the forest land, and 52 percent of the total land area. This is a decrease from 1985, when timberland acres totaled 2.9 million acres, or 90 percent of the forest land, and 58 percent of the total area.

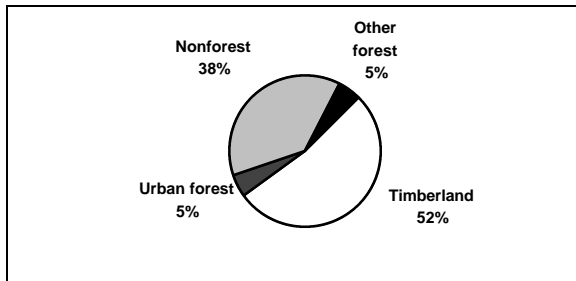


Figure 1. Area by land class, Massachusetts, 1998 (Source: Table 1).

As expected, the eastern, more urban counties showed a drop in forest land, while the western part of the state showed a slight increase since 1985. Across the state, there was a 3-percent drop in forest land since 1985, when forest land covered 64 percent of the area.

Unit	Percent		
	1985	1998	change
Western Massachusetts	1,317	1,348	+ 2.3
Worcester	688	634	- 7.9
Eastern Massachusetts	1,219	1,144	- 6.1
State total	3,224	3,126	- 3.0

Figure 2. Area (in thousand acres) of forest land and percent change, Massachusetts, 1985 and 1998 (Source: Table 48).

Timberland

When forest type is classified using relative stand density to calculate stocking (a new nationally developed standard procedure for all FIA projects—see **Comparison Between Inventories** section), the northern hardwoods type group is the most common in Massachusetts. Characterized by sugar maple, beech, yellow birch, and black cherry, this type group makes up 39 percent (1.0 million acres) of the timberland area. Oak/hickory forests cover

28 percent (0.7 million acres); white/red pine, 17 percent (0.4 million acres); oak/pine, 8 percent (0.2 million acres), and elm/ash/red maple, 5 percent (0.1 million acres). Other type groups combined contribute less than 100,000 acres.

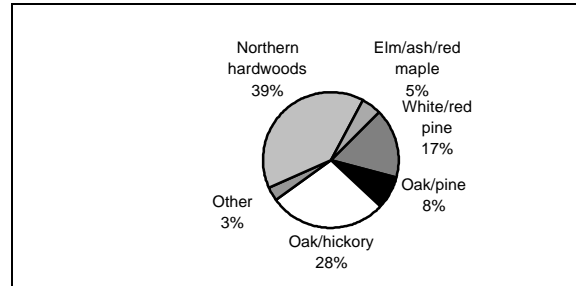


Figure 3. Timberland by forest-type group (based on relative density), Massachusetts, 1998 (Source: Table 4).

When forest type is determined using basal area to calculate stocking (the procedure used in 1985), the three major forest type groups are more equally represented. The northern hardwoods type group makes up 29 percent (0.8 million acres) of the timberland area. White/red pine forests cover 28 percent (0.7 million acres); oak/hickory, 26 percent (0.7 million acres); oak/pine, 9 percent (0.2 million acres), and elm/ash/red maple, 5 percent (0.1 million acres). Other type groups contribute less than 100,000 acres.

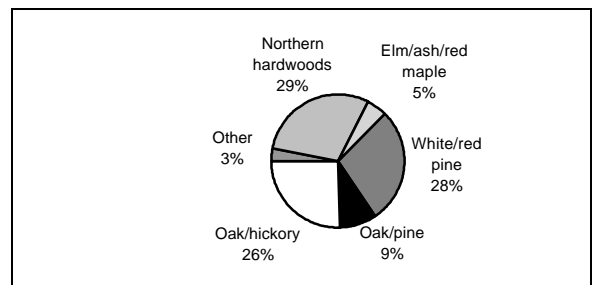


Figure 4. Timberland by forest-type group (based on basal area), Massachusetts, 1998 (Source: Table 6).

When stand size is determined using relative density as a factor, sawtimber stands (those in which the stocking of live sawtimber trees makes up the majority) are found on 67 percent of the timberland, or 1.8 million acres. Poletimber stands cover 28 percent (0.7 million acres), and sapling and seedling stands account for 5 percent (0.1 million acres). In 1985, stand sizes were distributed more evenly across the sawtimber and poletimber stands. Sawtimber stands covered 1.2 million acres (41 percent), while poletimber stands accounted for 1.5 million acres (51 percent). Sapling and

accounted for 0.2 million acres, or 8 percent. Poletimber stands showed a 51-percent drop while sawtimber stands increased by 48 percent.

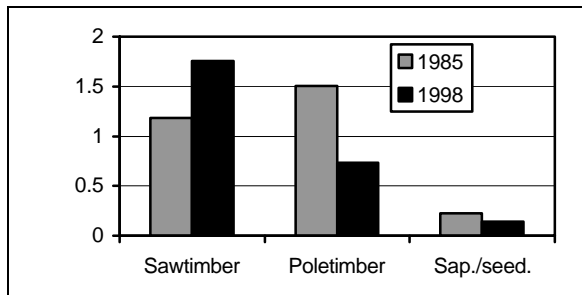


Figure 5. Area of timberland (in million acres) by stand-size class (based on relative density), Massachusetts, 1985 and 1998 (Source: Tables 3 and 4).

When stand size is classified using basal area to determine stocking, sawtimber stands are found on 73 percent of the timberland, or 1.9 million acres. Poletimber stands cover 23 percent (0.6 million acres), sapling and seedling stands, 4 percent (0.1 million acres). In 1985, sawtimber stands covered 1.6 million acres (55 percent), poletimber stands, 1.1 million acres (39 percent), and sapling and seedling stands accounted for 0.2 million acres, or 6 percent. Poletimber stands showed a 47-percent drop while sawtimber stands increased by 18 percent.

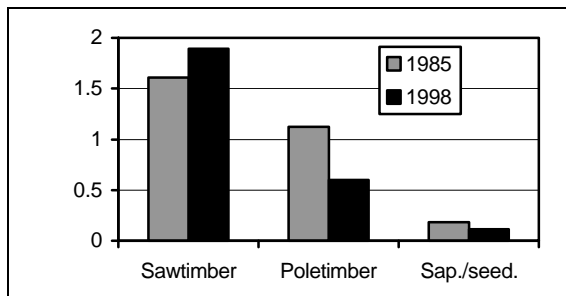


Figure 6. Area of timberland (in million acres) by stand-size class (based on basal area), Massachusetts, 1985 and 1998 (Source: Tables 5 and 6).

Numbers of Trees

There are 1.5 billion live trees 1.0 inch or larger in diameter at breast height (d.b.h.) on Massachusetts' timberland, or 584 trees per acre. Of these, .5 billion (194 trees per acre) are at least 5.0 inches in d.b.h. Red maple is the most common tree species in Massachusetts, accounting for 21 percent of all saplings and 24 percent of the live trees 5.0 inches and larger in d.b.h. Eastern hemlock is the second most common tree species, with 10 percent of the

saplings and 12 percent of the live trees at least 5.0 inches in diameter. White pine rounds out the top three overall, with 8 percent of the saplings and 14 percent of the live trees 5.0 inches and larger in d.b.h.

Growing-stock trees make up 91 percent of live trees 5.0 inches and larger in d.b.h. Red maple is the most common of the trees in this category, with 23 percent of the growing-stock trees. White pine makes up 15 percent of the total. Hemlock is third, with 12 percent of all growing-stock trees.

There has been a negligible change in the total number of growing-stock trees since 1985. However, since the timberland acreage is down, the number of growing-stock trees per acre is up, from 159 to 176 trees per acre.

In growing-stock trees 5.0 to 10.9 inches in d.b.h., there has been a decrease of 7 percent versus an increase of 28 percent in trees that are 11.0 inches and larger in diameter.

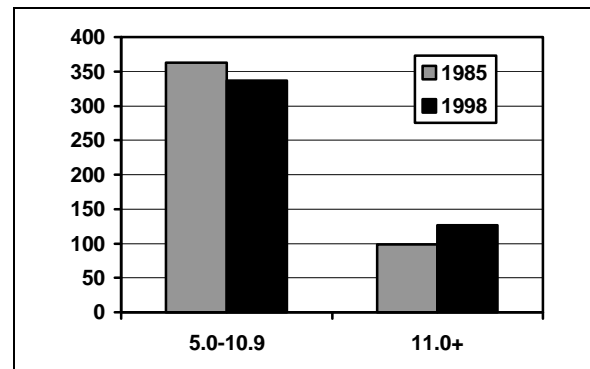


Figure 7. Number of growing-stock trees (in million trees) on timberland by diameter group, Massachusetts, 1985 and 1998 (Source: Tables 22 and 23).

Growing-Stock Volume

The volume of growing-stock trees in Massachusetts is 5.7 billion cubic feet, or 2,174 cubic feet per acre. This is a 17-percent increase since 1985 when the volume totaled 4.9 billion feet, or 1,686 cubic feet per acre. White pine is the leading species in growing-stock volume, with 1.3 billion cubic feet, or 24 percent of the total. Red maple growing-stock trees contribute 18 percent of the total volume, or 1.0 billion cubic feet. Northern red oak ranks third with 11 percent of the total (0.6 billion cubic feet). There has been no change in the ranking of the top three species since 1985.

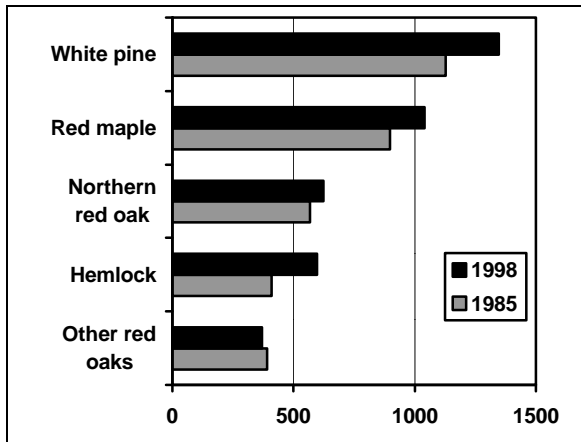


Figure 8. Net volume of growing-stock trees (in million cubic feet) on timberland, top five species, Massachusetts, 1985 and 1998 (Source: Tables 33 and 34).

Sawtimber Volume

With an average of 6,282 board feet per acre, there are 16.5 billion board feet of sawtimber volume in Massachusetts. In 1985, the volume was 12.4 billion board feet, or 4,252 board feet per acre; sawtimber volume has increased by 34 percent since the last inventory. As with growing-stock volume, white pine is the top species with 5.6 billion board feet, or 34 percent of the total. Red maple has 13 percent (2.1 billion board feet) of the total sawtimber volume. Rounding out the top three sawtimber volume species is northern red oak with 12 percent.

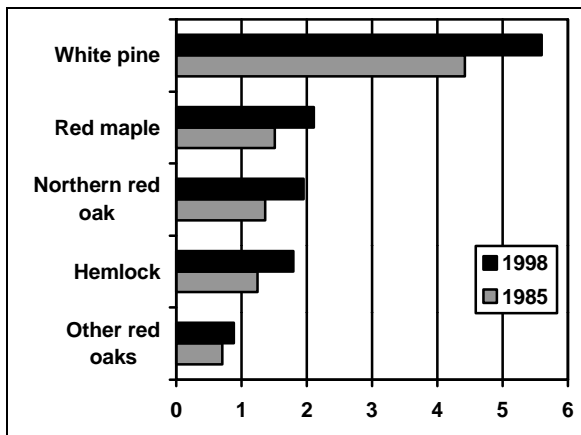


Figure 9. Net volume of sawtimber trees (in billion board feet) on timberland, top five species, Massachusetts, 1985 and 1998 (Source: Tables 36 and 37).

Growth and Removals

Since the last inventory, the average annual net growth of growing stock on timberland is 97.5 million cubic feet, or 37 cubic feet per acre per year. This represents 1.7 percent of the current inventory. Average annual removals of growing stock total 53.9 million cubic feet, or 20 cubic feet per acre per year. Net change is positive over the period since the last inventory, with an average annual net change of 43.5 million cubic feet.

Rates of growth to removals of growing-stock volume vary with tree species. Red maple is growing 2.5 times faster than it is being removed, either by harvest or by land-use change, while northern red oak, the species with the highest amount of total growing-stock removals, has a growth to removals ratio of 0.8.

Average annual net growth of sawtimber on timberland is 388.4 million board feet, or 148 board feet per acre per year. The rate of growth to removals of sawtimber volume is 2.9. Annual removals are 132.3 million board feet per year, or 50 board feet per acre annually. Removals combined with growth yielded a positive annual change in board-foot volume of 256.1 million board feet.

For all major species there was a positive change in board-foot volume, with white pine showing the largest annual increase at 67.8 million board feet and a growth-to-removals ratio of 2.6. Northern red oak, with a growth-to-removals ratio of 1.7, showed an annual increase of 20.2 million board feet.

Species	Growing stock	Sawtimber
White pine	1.9	2.6
Red maple	2.5	6.5
Northern red oak	0.8	1.7
Hemlock	11.8	14.9
Other red oaks	0.9	1.8

Figure 10. Growth-to-removals ratios of growing-stock and sawtimber volume on timberland, top five species, Massachusetts, 1984-1997 (Source: Tables 40 and 41).