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Michigan State University Extension Service
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Issued October 1988
8 pages

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Michigan's Timberland

A Status Report



By

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Cooperative Extension Service • Michigan State University

Extension Bulletin E-2129 • October 1988 (New)

This publication is based on data published by the U.S. Department of Agriculture in *Michigan's Forest Statistics, 1987: An Inventory Update*, General Technical Report NC-112, 1987.

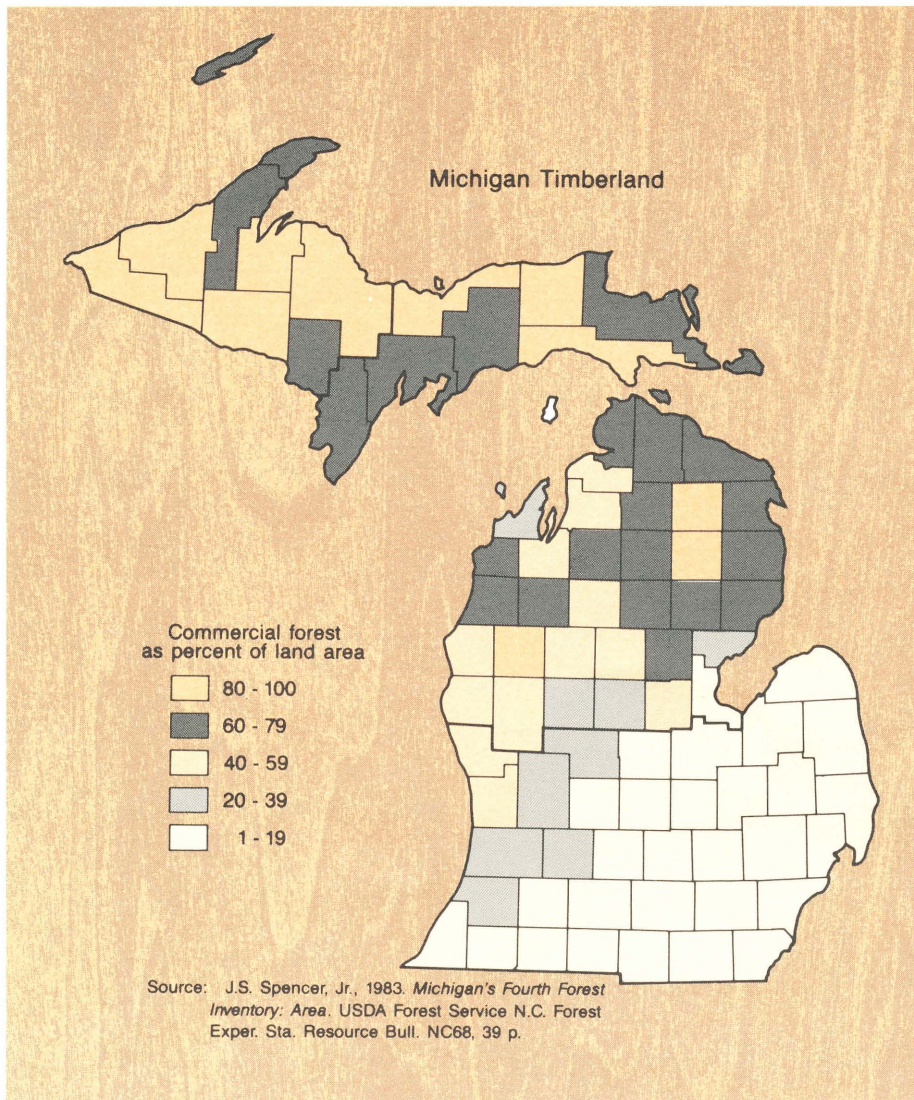
Michigan is richly forested—half of its land is forestland and 48 percent is commercially important timberland.¹ As one moves north and then west through the state, the proportion of land in forest increases. (See map.) As shown in Fig. 1, timberland in the southern Lower Peninsula (SLP) is 2.4 million acres, and in the northern Lower Peninsula (NLP), 6.7 million acres. Such lands make up 38 percent and 50 percent, respectively, of all the land in these regions. The eastern Upper Peninsula (EUP) has 3.8 million acres of timberland and the western UP (WUP), 4.5 million acres. Because forestlands make up 80 percent of the eastern half and 81 percent of the western half of the UP, they exert an especially strong influence over the ecology and economy of this region.

During the past two decades, the rate of decline in timberland acreage has slowed considerably. According to the U.S. Forest Service, the 1987 inventory figure of 17.3 million acres of timberland is down 8 percent since 1966. The largest portion of this loss—300,000 acres—has been in the southern Lower Peninsula (SLP). Since 1980, the decline has been estimated at less than 1 percent, with the largest loss being 49,000 acres in the northern Lower Peninsula (NLP).

The most common forest types² are oak-hickory, elm-ash-soft maple, maple-birch, and aspen. Together these four types account for 72 percent of Michigan's timberland. The maple-birch and aspen timber types are the largest, occurring on 55 percent of the timberland. Maple-

¹Michigan's forestland includes timberland containing or capable of producing commercially important trees and not withdrawn from timber utilization—95.2 percent of forestland; woodland incapable of producing commercially important trees because of poor site conditions—1.4 percent; and forestland reserved for uses that preclude commercial timber harvest—3.4 percent. Unless otherwise noted, data in this bulletin are for timberland.

²A forest type is a classification of forestland based on the tree species forming the majority of live tree stocking.



birch is 35 percent of the total and aspen is 19 percent (Fig. 2). Jack, red and white pine occur on only 10 percent. The remaining 18 percent of timberland is either in one of six other forest types or is timberland without trees.

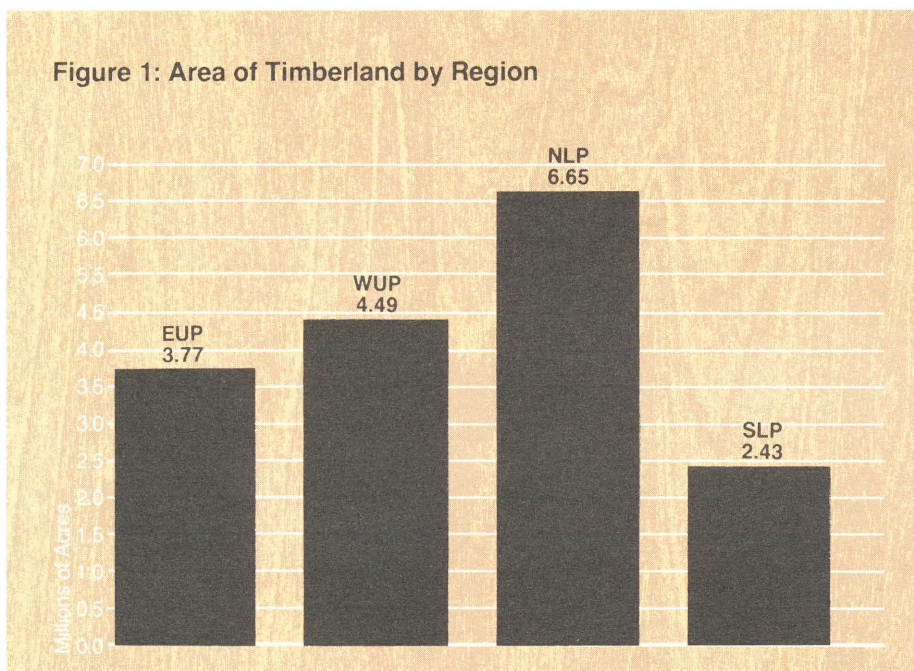
Two-thirds of Michigan's timberland is privately owned.

Timberland ownership is roughly two-thirds private and one-third public (Fig. 3). The largest ownership class is miscellaneous private individuals which is composed of private owners other than the forest industry or farmers. This category accounts for 26 percent of all timberland (Fig. 4), 18 percent of the timberland in the UP and 33 percent in the Lower Peninsula (LP). Farmers own 18 percent, accounting for 8 percent and 28 percent of the timberland in the UP and LP, respectively. Forest industry land, 11 percent, is mostly in the UP, where 23 percent of the timberland is in this ownership class.

The state of Michigan is the major public owner, with 21 percent of the timberland statewide, 19 percent in the UP and 22 percent in the LP (Fig. 4). This land is administered by the Forest Management and Wildlife Divisions of the Department of Natural Resources. Federal ownership, mainly managed by the U.S. Forest Service, is 14 percent statewide, 19 percent in the UP and 10 percent of the timberland in the NLP (Fig. 4).

No single ownership class has the majority of timberland in any region. Miscellaneous private individuals and farmers together, however, own 60 percent of the LP's timberland. In the UP, they account for only 26 percent of timberland acreage. The UP is characterized more by large industrial and governmental ownership. Management and use of Michigan's UP timberlands vs. LP timberlands differ accordingly.

Figure 1: Area of Timberland by Region



The average timberland site in Michigan has a site index of 61.

This means it is capable of growing a tree 61 feet tall in 50 years.

Twenty-eight percent of Michigan's timberland is of high site quality, with site indexes of 70 or above. Sixty percent is of medium quality, with site indexes of 40 to 70. The remaining 12 percent is low quality, with site indexes below 39 (Fig. 5).

Site quality is not distributed evenly across forest type. The aspen forest type has the highest proportion of high quality sites—46 percent—and 52 percent medium sites. The maple-birch type has 35 percent high sites and 62 percent medium sites. Elm-ash-maple is slightly poorer, with 33 percent high and 57 percent medium sites. Oak-hickory is 27 percent high sites and 70 percent medium sites. The red, white and jack pine are concentrated on medium sites, with 79 percent of these types on lands with site indexes of 41 to 70. Only 12 percent are on sites of high quality.

Michigan's sawtimber stands account for 26 percent of all timberland.

Timber stand size classes are sawtimber, poletimber, and seedling and sapling. Sawtimber stands are those with an average diameter of 9 inches dbh (diameter at breast height—4.5 feet above the ground) or larger for softwoods, or 11 inches dbh or larger for hardwoods. Michigan's sawtimber stands account for 26 percent of all timberland stands (Fig. 6A), compared with 45 percent nationally. Poletimber stands are those with average diameters of at least 5 inches dbh but smaller than sawtimber. They account for 43 percent of Michigan's timberland, compared with 28 percent nationally. Seedlings and saplings stands have an average diameter of at least 1 inch but are smaller than poles. They account for 30 percent of Michigan's timberland acreage (Fig. 6A).

Figure 2: Species Distribution

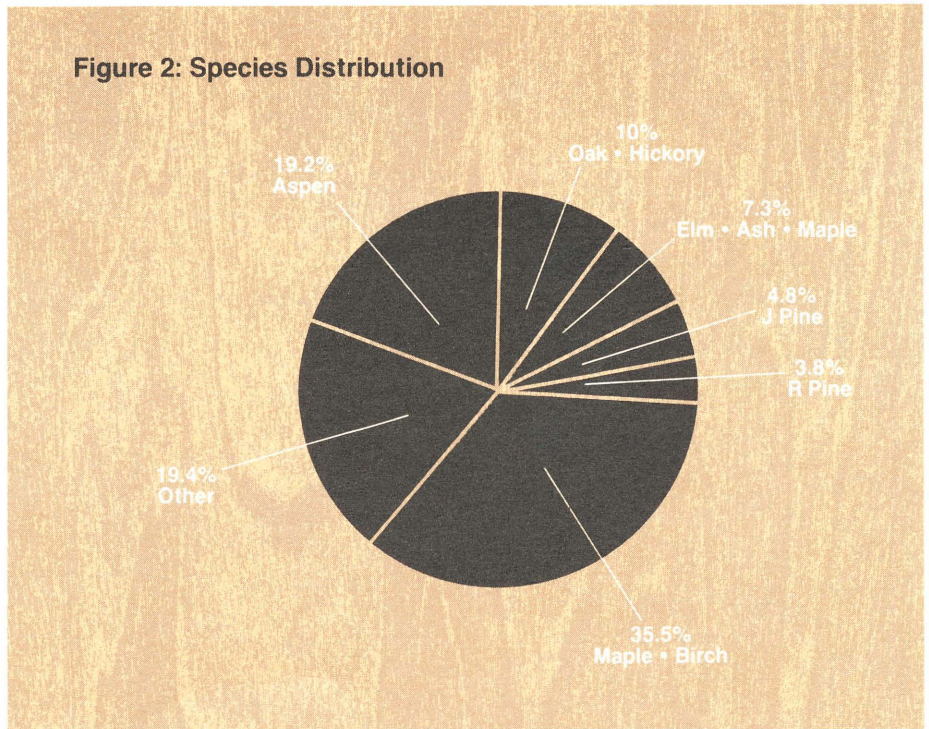


Figure 3: Percent Ownership of Timberland

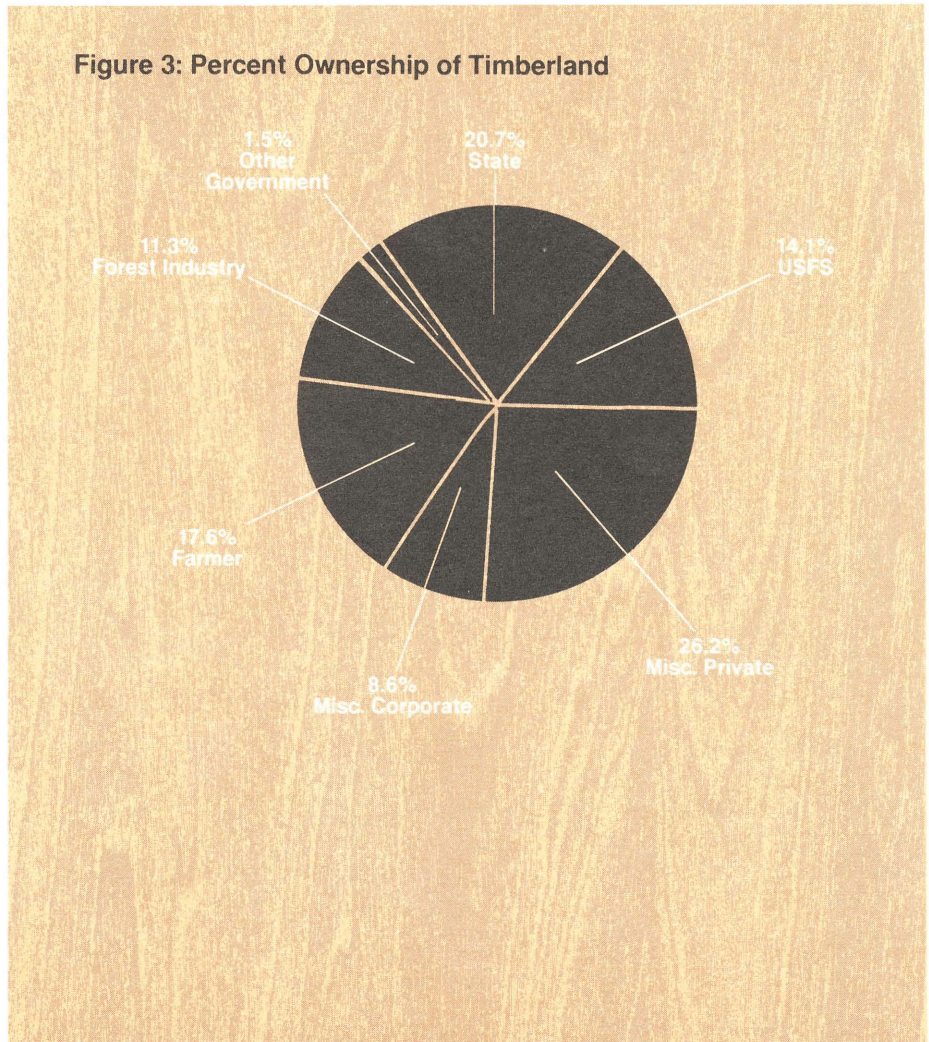


Figure 4: Private and Public Ownership

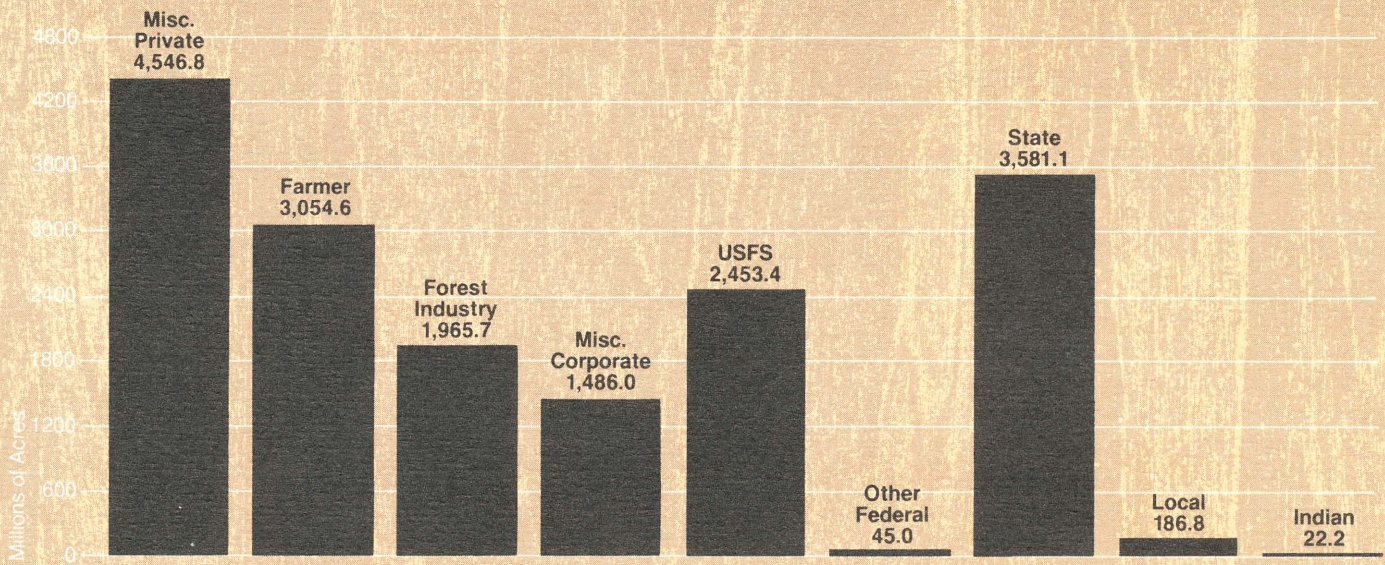
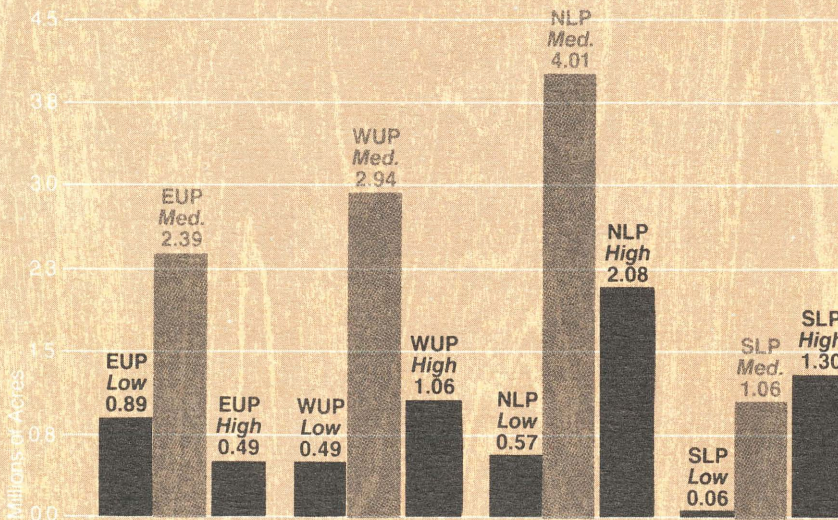


Figure 5: Site Index Class Distribution



Twenty-two percent of LP timber is sawtimber, 41 percent poles, and 37 percent seedlings and saplings (Fig. 6B). Thirty percent of UP timber is sawtimber (Fig. 6C). It has 56 percent of all sawtimber (the WUP alone has 35 percent of the state's sawtimber), mostly in the maple-birch type.

White pine is the only timber type in which the majority of stands are sawtimber stands. Sixty-six percent of the acreage in this type contains sawtimber size trees. Only 22 percent of the jack-red-and white pine-type as a group, however, is in sawtimber stands, and 46 percent is in poletimber.

Maple-birch, the most common forest type, has sawtimber stands on 2.5 million acres, 17.5 times the sawtimber stand acreage in the white pine type. Acreage in the shorter-lived trees in the aspen type (mainly aspen) is 9 percent sawtimber, 39 percent poletimber, and 52 percent seedlings and saplings. Twenty percent of the valuable oak-hickory type is sawtimber and 44 percent is poletimber. Elm-ash-maple has about

one-third of its acreage in each of the three size classes.

Estimated 1987 growing stock volume: 20.6 billion cubic feet.

The total stock of timber is measured as the net volume in trees that are at least 5 inches dbh. The volume is calculated for the portion 1 foot from the ground up to a top diameter of 4 inches. The U.S. Forest Service estimates Michigan's 1987 growing stock volume to be 20.6 billion cubic feet.³ This figure is up 10 percent since 1980 and up 37 percent since 1966. Projected growing stock levels in the four survey districts are shown in Fig. 7. In total, the growing stock inventory is 68 percent hardwoods and 32 percent softwoods.

The NLP, with 37 percent, has the largest percentage of total growing stock, and the SLP has the smallest, 12 percent. The EUP and the WUP have 21 percent and 30 percent, respectively.

For the commercially important aspen forest type, total growing stock volume in 1987 is estimated to be 12 percent larger than it was in 1980. For the NLP, where 51 percent of the aspen is located, removals from timber harvest, mortality and other causes were projected to exceed growth during the 1980-1987 period, leaving an inventory of growing stock that is 1 percent smaller than it was in 1980. The UP has 44 percent of the aspen growing stock volume, up 16 percent since 1980.

Michigan's sawtimber volume is 52.3 billion board feet.

Of that sawtimber volume (board feet in sawlog-sized trees), 66 percent is hardwoods and 34 percent softwoods. Sawtimber volume is 41 percent of the 20.6 billion cubic feet of growing stock shown regionally in Fig. 7. Sawtimber volume was projected by the Forest Service to have

³There are approximately 79 cubic feet per cord.

Figure 6A: Size Class Distribution: Michigan

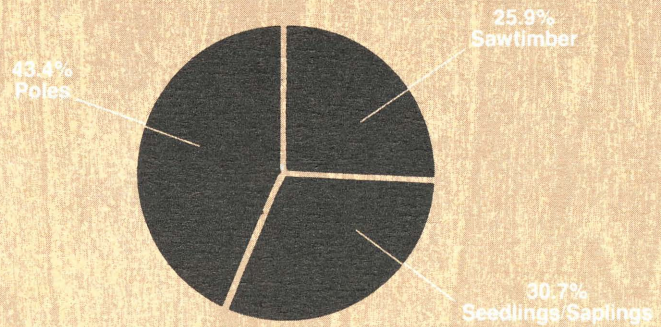


Figure 6B: Size Class Distribution: Lower Peninsula

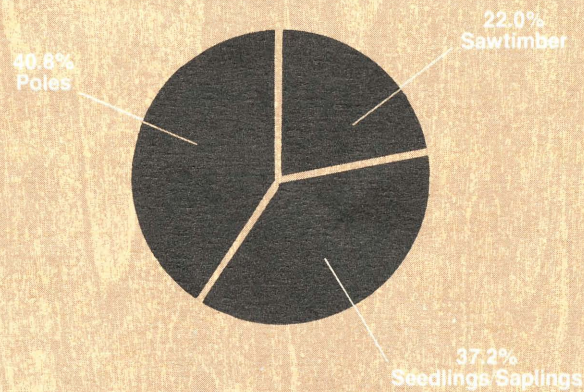


Figure 6C: Size Distribution: Upper Peninsula



Figure 7: Growing Stock by Region

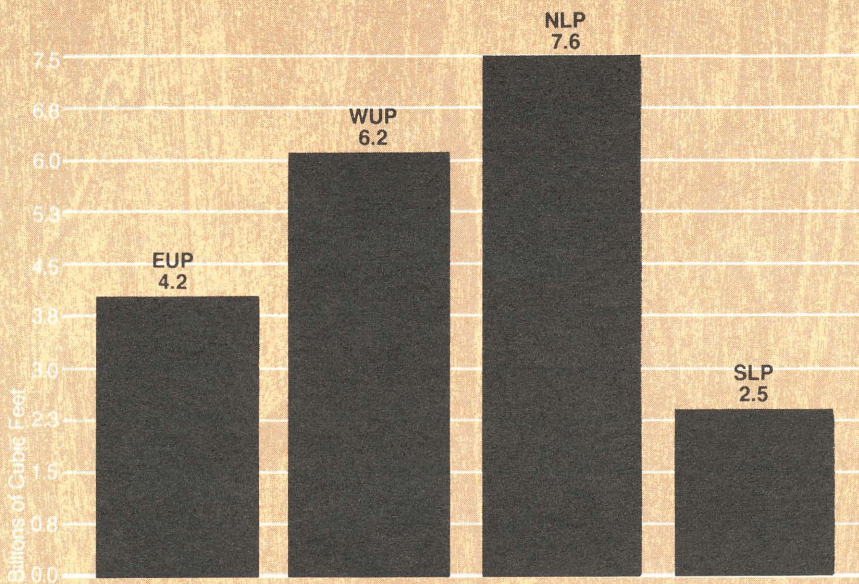
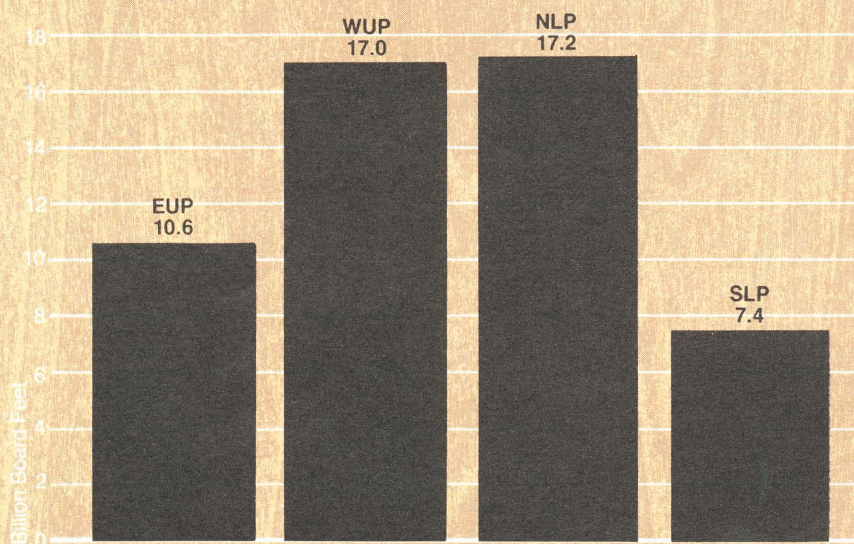


Figure 8: Sawtimber Volume by Region



increased by 19 percent between 1980 and 1987 and 55 percent between 1966 and 1987. The estimated 1987 sawtimber volume is twice the sawtimber inventory in 1955.

Regional distribution of sawtimber is shown in Fig. 8. Though the WUP has only two-thirds the forestland acreage of the NLP (Fig. 1), it contains the same volume of sawtimber. Two reasons for this exist. First, the WUP has 1.3 times the NLP's maple-birch type acreage. About half (49 percent) of the sawtimber occurs in this forest type. Second, many stands of poletimber-sized trees grew into the more valuable sawtimber stands in two large WUP types: balsam fir and northern white cedar. Statewide, half of the 1980-87 net sawtimber growth was due to this type of growth.

During the 1980-87 period, growth of growing stock was nearly twice that of removals.

Over the same period, the ratio of growth to removals was 3.5 for maple-birch. The second lowest periodic growth vs. drain ratio was 1.1 for aspen. Statewide, only oak-hickory has a ratio of less than one (0.6).

Regionally, periodic growth/drain ratios are positive. They vary from 1.2 in the SLP to 2.4 in the WUP (Fig. 9). Within regions, the highest ratio, 14.4, is for the red pine type in the NLP⁴. The lowest is for the northern white cedar type in the WUP, which had negative growth for 1980-87.

For sawtimber, the growth/drain ratio for all regions and types during the 1980-87 period is 2.3 (Fig. 10). The highest is 7.9 for red pine⁵, a forest type that accounts for 4 percent of

⁴This ratio is probably too high to be sustained—a major red pine utilization facility that began operation in the NLP in 1986 will significantly increase removals.

⁵See footnote four.

the state's timberland and occurs mainly in the NLP and EUP. The lowest is 0.8 for oak-hickory, the third largest timber type in the state, 60 percent of which is in the NLP, and 38 percent in the SLP. In both of these types, ingrowth exceeded growth on existing sawtimber stands during 1980-87

Live tree biomass on timberland is 1.2 billion tons.

Seventy-four percent of this is hardwoods, 26 percent softwoods. Fig. 11 shows that 53 percent of the biomass is in the UP and 47 percent in the LP.

Statewide, trees over 5 inches dbh account for 86 percent of the live tree biomass. Also statewide, average weight is 52 lb/cubic foot, or 1,404 lb/cubic yard.

Several key characteristics exert a strong influence over the management of Michigan's forests and their products.

Michigan's forests continue to be held primarily by private landowners. Farmers, non-industrial owners with small holdings and non-forest products industrial owners hold almost half of the state's forestland. This presents challenges in improving forest management and production. These owners have ownership objectives that may not coincide with public expectations from these lands. The state continues to hold more inventory in "fiber trees" than in sawtimber. The proportion of Michigan's forests in sawtimber stands is much lower than the national average—26 percent vs. 45—and is down slightly from the 28 percent of 1980. In the near term, therefore, more opportunities exist for development in the fiber-producing segment of the forest industry. The growth/drain ratios over the past seven years also indicate opportunities for development with underutilized species such as red pine and maple.

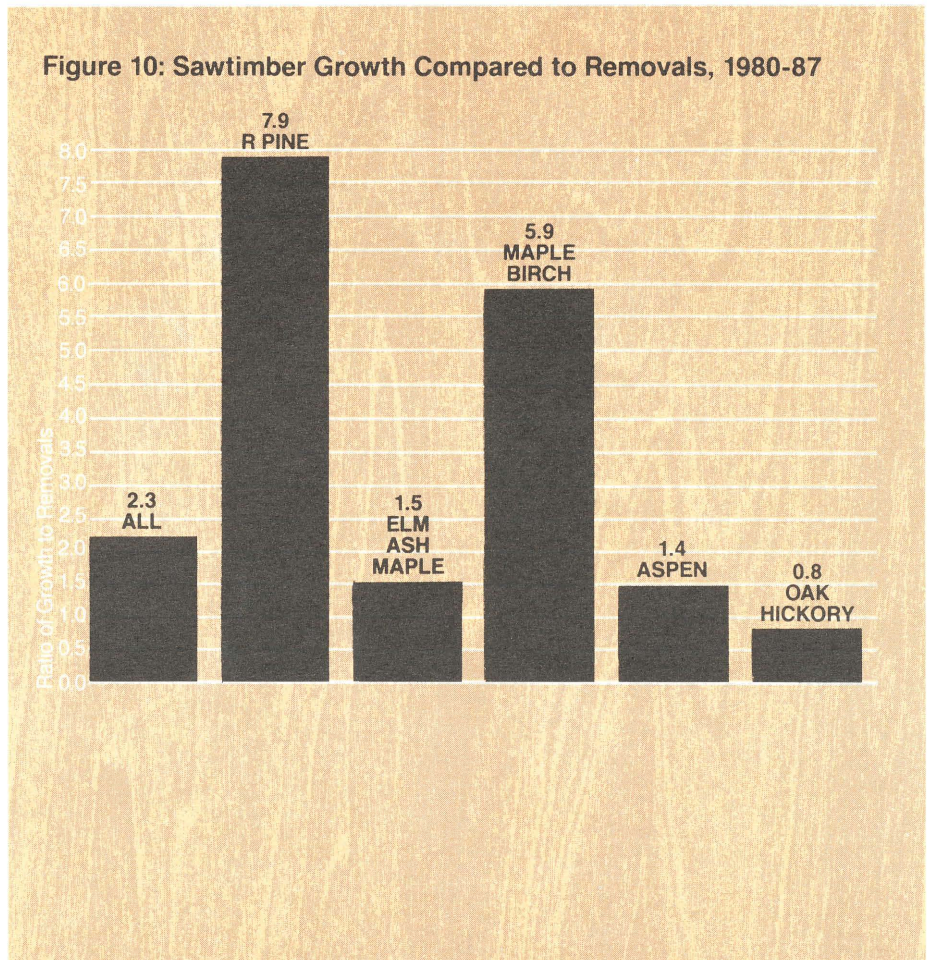
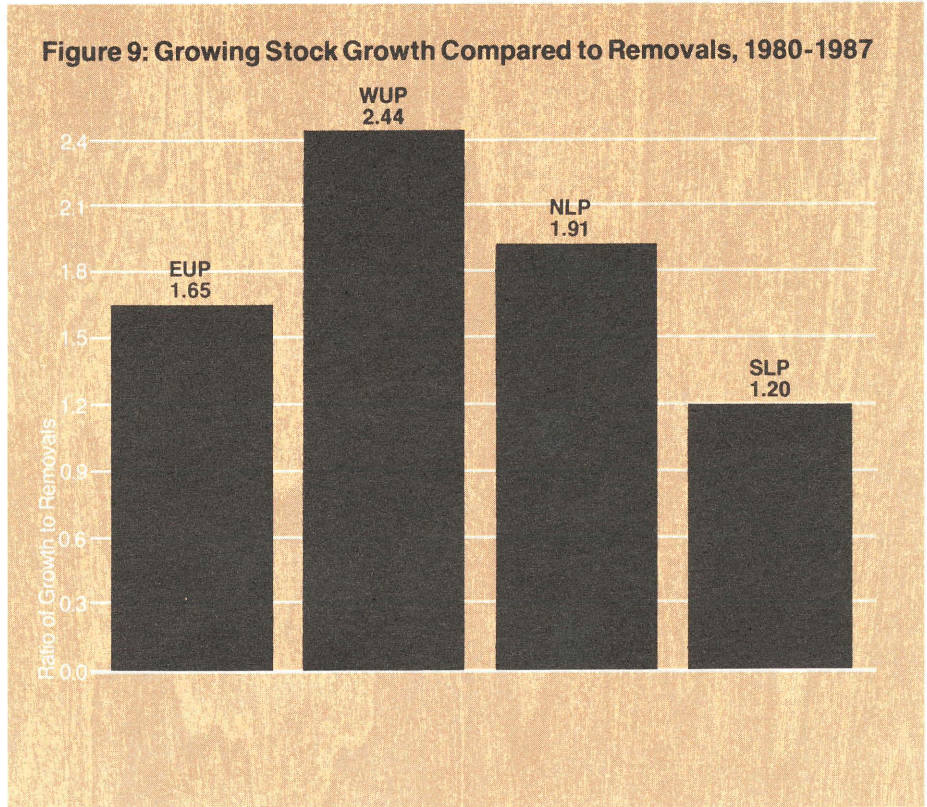
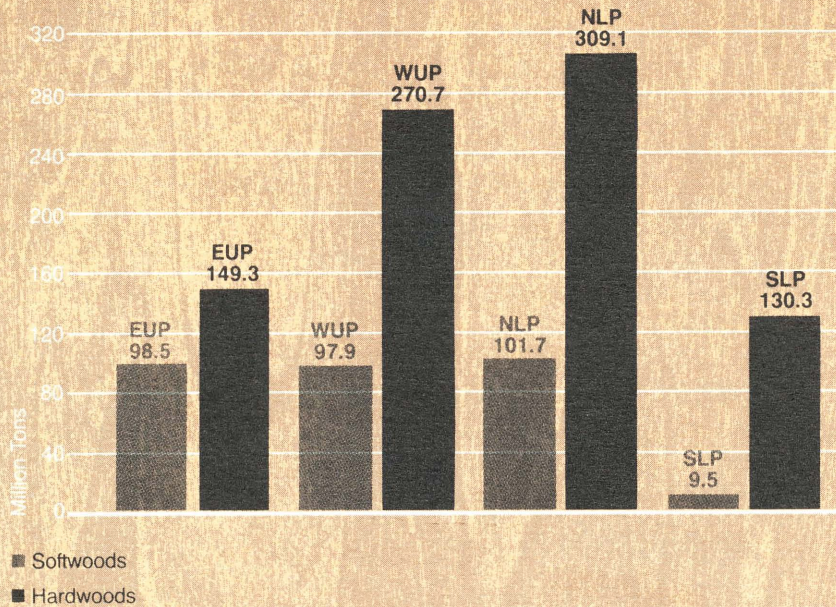


Figure 11: Biomass Distribution by Region



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- E0616, *Familiar Trees of Michigan*, 22 pp (.40)
- E1238, *Forestry Terms for the Landowner*, 8 pp (free)
- E1492, *Why Manage Your Woodlot*, 2 pp (free)
- RR455, *Statistical Survey of the Michigan Tree Seedling Industry*, 20 pp (.50)
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