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# Michigan Forest Statistics, 1993

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Forest Service—U.S. Department of Agriculture  
1992 Folwell Avenue  
St. Paul, Minnesota 55108  
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1996**

This report includes the most commonly used Forest Inventory and Analysis statistics. Additional forest resource data can be provided. Persons requesting additional information from the raw inventory data are expected to pay the retrieval costs. These costs range from less than \$100 for a relatively simple request to more than \$2,000 for a complex retrieval involving the services of a Forest Inventory and Analysis computer programmer. Requests will be filled so as to minimize the impact on the Forest Inventory and Analysis Work Unit.

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## FOREWORD

The fifth inventory of Michigan was directed by Neal Kingsley, Forest Inventory and Analysis (FIA) Program Manager, North Central Forest Experiment Station. Robin Bertsch, Forest Development Section Chief, Michigan Department of Natural Resources Forest Management Division, was responsible for all State contacts and activities during the inventory process. Jerold Hahn and Mark Hansen were responsible for inventory design. Jerry Ostrom supervised the FIA field staff. Beth Collins supervised FIA's photo interpretation staff.

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Pat Miles and Mark Hansen were responsible for generating area, volume, growth, and removals tables. Dennis May, Ron Hackett, and Ron Piva, with assistance from Jack Pilon of the Michigan DNR, collected and compiled data on timber products output and timber removals. Barb Knight and Jay Solomakos edited the data, and Mary Jo Resendez prepared the tables for printing. Mary Jean Hanson, Barb Freund, and Dan Goodman provided administrative and secretarial support. Computer support was provided by Gerhard Raile.

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# Michigan Forest Statistics, 1993

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## HIGHLIGHTS

**Note:** *Data from new forest inventories are often compared with data from earlier inventories to determine trends in forest resources. However, for the comparisons to be valid, the procedures used in the two inventories must be similar. As a result of our ongoing efforts to improve the efficiency and reliability of the inventory, several changes in procedures and definitions have occurred since the last Michigan inventory in 1980. Because some of these changes will make it inappropriate to directly compare the 1993 data with those published for 1980, data from the 1980 inventory have been reprocessed using the 1993 procedures. Please refer to the section labeled "Comparing the Fifth Inventory of Michigan With the Fourth Inventory" for more details.*

## General

Michigan's location and geography combine to form an ecological landscape that is diverse and in many ways unique. The State's two peninsulas—the Upper and Lower—support an association of biotic and environmental factors that forms diverse forest communities. Before settlement, what is now Michigan had an estimated 35.5 million acres of forest land (Chase *et al.* 1970). The forest landscape mostly reflected the gradients of climate and soils found throughout the State. For example, in the southern half of

the Lower Peninsula, on well-drained upland soils, black oak, white oak, red maple, and shagbark hickory dominated. On the moist, but finer upland soils, sugar maple, beech, basswood, and red oak were prevalent. In areas near Lake Michigan, beech and maple were common. On muck, alluvial, or lake plain soils, ash, elm, silver and red maple, and swamp white oak were common (Sommers 1977). In the northern Lower Peninsula and the eastern Upper Peninsula, beech, maple, yellow birch, hemlock, and balsam fir dominated loamy upland soils, particularly near Lake Michigan. On the interior, drier sandy soils, large areas of pine were common. Black spruce and northern white-cedar were found on low, boggy sites. In the western Upper Peninsula, the rocky landscape supported sugar maple, basswood, red oak, yellow birch, and hemlock. Pockets of pines were scattered throughout the region (Sommers 1977).

The shape and structure of the original forest of Michigan were also affected by various natural disturbance regimes. Fire was the dominant natural disturbance in the oak-hickory forest of southern Michigan. Windstorms, such as tornadoes and "downburst," together with gaps in the overstory, were responsible for regenerating the beech-sugar maple forest (McNab and Avers 1994). In the pine forest of the northern Lower and the eastern Upper Peninsulas, catastrophic fires were more common, occurring about every 80 to 250 years. In the western Upper Peninsula, windfall played a role in shaping the northern hardwood forest (McNab and Avers 1994).

Before settlement, the forest extended over nearly 95 percent of the land that is now the State of Michigan. It was a diverse and dynamic forest that supported a myriad of associated flora and fauna. However, the early settlers viewed the forest as an impediment to development and as a source of raw material that would drive and sustain that development. The primary value of the forest to them was its timber resources. The original forest was estimated to contain about 10 million acres of

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prime pine and 9 million acres of high-quality northern hardwoods (Chase *et al.* 1970).

In the mid-1800's, the forest of Michigan began to undergo radical changes. White pine was cut extensively, and Michigan was the Nation's largest supplier of white pine lumber by the late 1800's. White pine and other timber products from Michigan's forests provided much of the wood products that went into building the urban centers of the Midwest. However, after about a century of extensive logging and clearing of land for agricultural production, the forest was reduced and left in a condition that hardly resembled the original forest. The first statewide forest inventory conducted in 1935 by the USDA Forest Service revealed that Michigan's original forest area had been nearly halved, to about 19 million acres.

Forest land in the southern Lower Peninsula was mostly in small woodlots where many of the high-quality northern hardwood trees had been removed. The northern half of the Lower Peninsula had the greatest acreage of "deforested" land of any region in the Lake States (Cunningham and Moser 1938). In most of the northern Lower Peninsula, logging, subsequent fires, and land converting naturally back to forest changed the composition of the forest. In most areas where white and red pines once stood, early successional species, such as paper birch, trembling and bigtooth aspen, red maple and, jack pine took over. A few remnant stands of old white pine provided a glimpse of what the original white pine forest probably looked like. Hartwick Pines State Park near Grayling is a good example. Tree-planting programs in the northern Lower Peninsula resulted in scattered tracts of red pine. Only in the Upper Peninsula were there areas of forested land that contained many sawtimber size trees. Some stands of old sugar maple, yellow birch, hemlock, basswood, and elm closely resembled their presettlement counterparts.

After the first statewide inventory in 1935 (U.S. Department of Agriculture 1936), other inventories were conducted in 1955 (Findell *et al.* 1960), 1966 (Chase *et al.* 1970), 1980 (Spencer 1983, Spencer and Hahn 1984), and the most recent one in 1993. From the first inventory to the current one, Michigan's forest land has continued to recover from the period of exploitation, and the quality of timber produced has continued to improve. Like the original forest, the present forest landscape is a reflection of

climate and soils; however, forest management practices have played an important role in the condition of the present forest. In fact, it is largely because of improved forest management practices that the area of forest land has remained fairly constant since 1935, while supporting an expanding forest industry and providing other values, such as recreation and wildlife habitat.

This report presents in highlight form some major findings from the 1993 forest inventory of Michigan's forest land, with comparisons to the 1980 inventory. Provided is an overview of forest land area, with emphasis placed on timberland area, volume, growth, mortality, and removals. (See Appendix, Definition of Terms, for definitions of terms used in this report.)

### Area

- The 1993 inventory revealed 19.3 million acres of forest land in Michigan. Forest land accounts for about half (53 percent) of the State's 36.4 million acres of land. Between 1980 and 1993, forest land in Michigan increased by 933 thousand acres, or by 5 percent. For inventory and analysis purposes, Michigan is divided into four Survey Units (fig. 1). In the Eastern Upper Peninsula and the Western Upper Peninsula Survey Units, about 8 of every 10 acres of land is forested. In the Northern Lower Peninsula Survey Unit, about 6 of every 10 acres is forested. In the Southern Lower Peninsula Survey Unit, forest land is sparse and more fragmented, with less than 2 of every 10 acres forested.
- More than half a million acres (574.7 thousand acres) of forest land in Michigan is classified as reserved forest land, on which timber harvesting is not permitted. The majority of reserved forest land (350.5 thousand acres) is in the two Upper Peninsula Survey Units. Much of the reserved forest land in the Upper Peninsula is in the Ottawa and Hiawatha National Forests, Isle Royale National Park, and Pictured Rocks National Lakeshore.
- In 1993 there were 18.6 million acres of timberland in Michigan, an increase of 1.1 million acres from the 17.5 million acres in 1980, or a 7-percent gain. More than 90 percent of the increase occurred in the Lower Peninsula. Some of the increase was due to

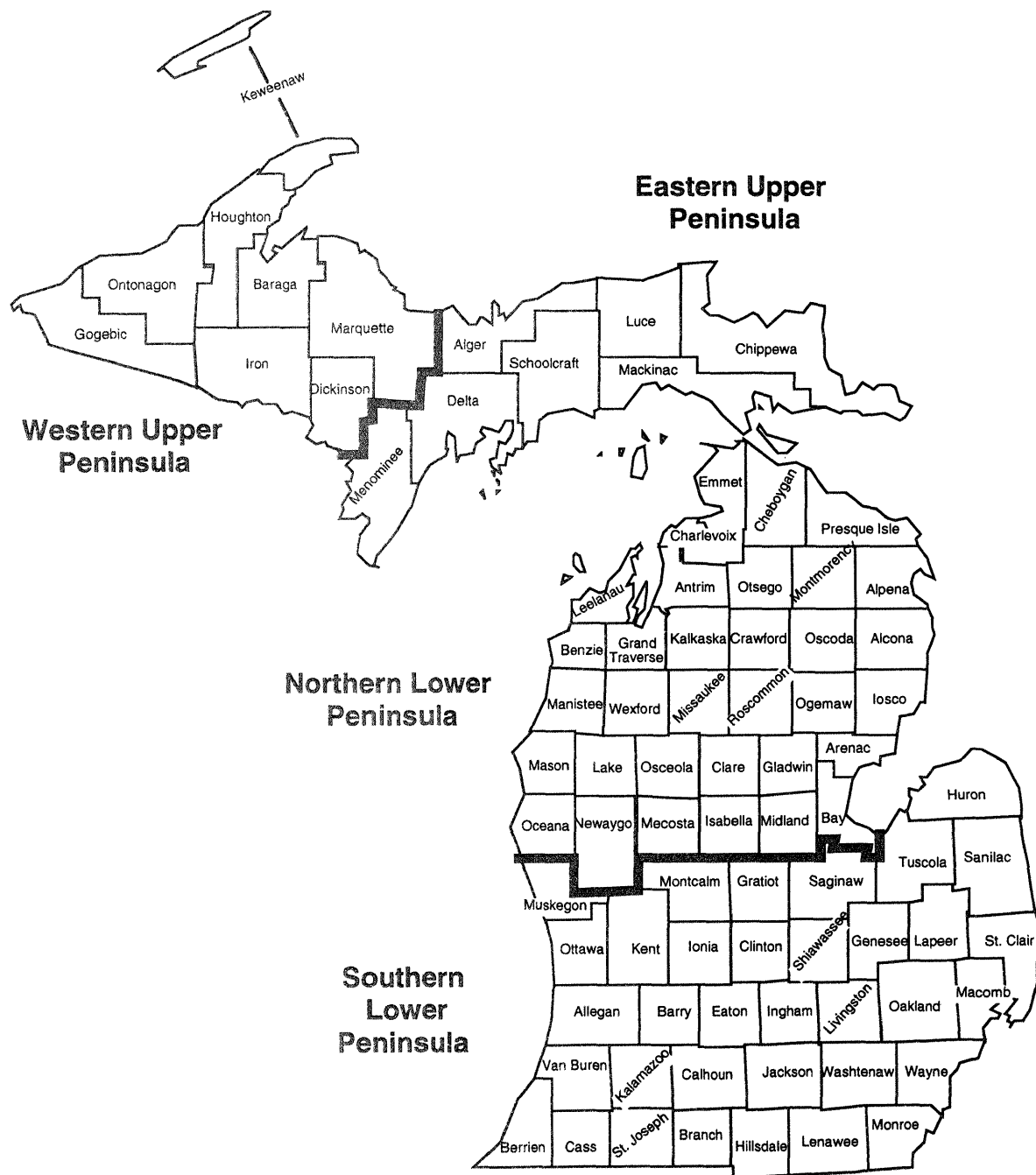


Figure 1.—Forest Survey Units in Michigan, 1993.

abandoned cropland and pasture reverting back to timberland, and some was due to unproductive land (nontimberland) being reclassified as marginally productive timberland. Timberland area amounts to 97 percent of the forest land in Michigan.

- Individuals are the predominant timberland owner group in Michigan; they own 46 percent (8.4 million acres) of the State's timberland area. Various governmental agencies administer 35 percent (6.6 million acres) of Michigan's timberland—the majority by State government (20 percent) and the USDA Forest Service (14 percent). Corporate owners (corporations not in the business of operating primary wood-using plants) own 11 percent (2.1 million acres), and forest industry owns 8 percent (1.5 million acres) of Michigan's timberland area (fig. 2). Indian tribal groups and other federal agencies, combined, own less than 1 percent (64.2 thousand acres) of the State's timberland.

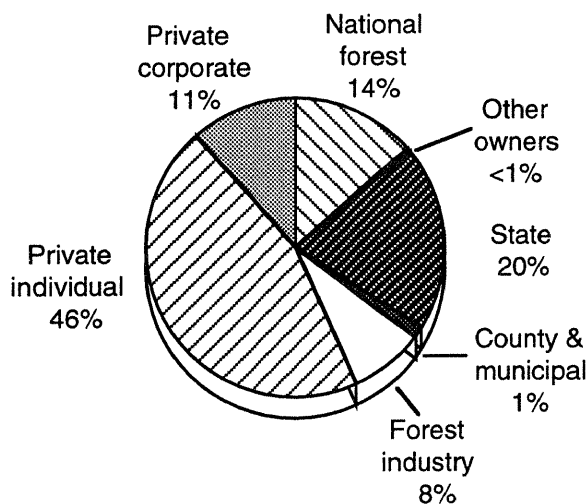


Figure 2.—Timberland ownership by ownership class, Michigan, 1993.

- The pattern of timberland ownership differs by Survey Unit. Although only 8 percent of the State's timberland is owned by forest industry, virtually all of that (99.6 percent) is located in the Upper Peninsula Survey Units—the majority in the Western Upper Peninsula Unit. In the Upper Peninsula Units and the Northern Lower Peninsula Unit, more than one-third of the timberland is in public ownership. Individuals and corporations own most of the timberland in

the two Lower Peninsula Survey Units. For example, in the Northern Lower Peninsula Survey Unit, 59 percent of the timberland area is owned by individuals and corporations. A significant proportion of the corporate-owned timberland is used primarily for recreation, especially hunting. In the Southern Lower Peninsula Unit, individuals own 80 percent of the timberland area.

- Michigan's timberland area grows mostly hardwood trees. Hardwood forest types occupy three-fourths (13.9 million acres) of the timberland area. The maple-beech-birch forest type group is the dominant type group in Michigan, occupying 38 percent (7.2 million acres) of the timberland area. The aspen-birch forest type group ranks second in area, occupying 17 percent of the timberland area (3.2 million acres); followed by the spruce-fir type group with 14 percent (2.7 million acres); the white-red-jack pine types group and the oak-hickory type group, each with 11 percent (2 million acres each); and the elm-ash-soft maple type group at 9 percent (1.6 million acres) (fig. 3). (Note: Table 3, in the Appendix, breaks down the area of forest types into local forest types.)

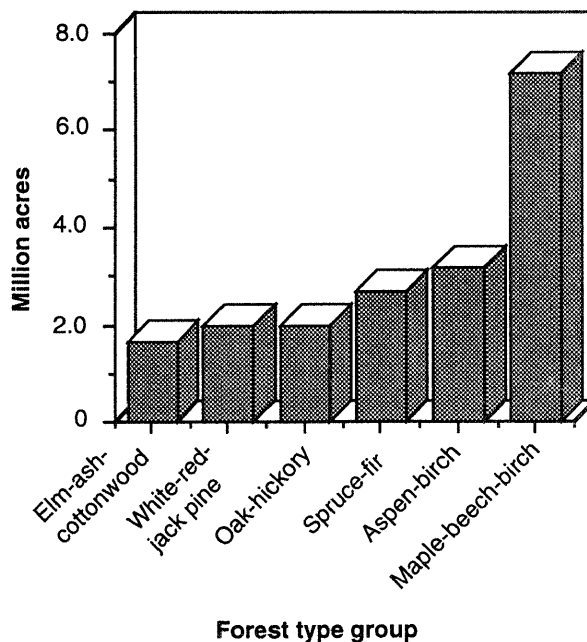


Figure 3.—Area of timberland by forest type group, Michigan, 1993.

- The maple-beech-birch and the aspen-birch forest types groups occupy extensive areas in

all Survey Units, except in the Southern Lower Peninsula Unit, where the aspen-birch forest type occupies only 5 percent of the timberland area. The oak-hickory type is found almost exclusively in the Northern and Southern Lower Peninsula Units. In the Northern Lower Peninsula Unit, this type contains only a small number of hickory trees. White-red-jack pine types are found mostly in the Northern Lower Peninsula Unit (61 percent). Most (78 percent) of the area in the spruce-fir forest type is in the Eastern and Western Upper Peninsula Units.

- Stocking on timberland areas continues to improve. In 1980, approximately 89 percent of the timberland area was moderately stocked to overstocked with growing-stock trees. By 1993 this had increased to 93 percent.
- The area of sawtimber stands on timberland increased from 5.5 million acres in 1980 to 8.6 million acres in 1993, as poletimber stands grew into the sawtimber size class. Between inventories, area in poletimber stands declined by 26 percent. The increase in sawtimber-size stands and the corresponding decline in poletimber-size stands show the continuing maturation of stands in Michigan. The area of sapling-seedling stands stayed at about one-fourth of the State's timberland area (fig. 4).

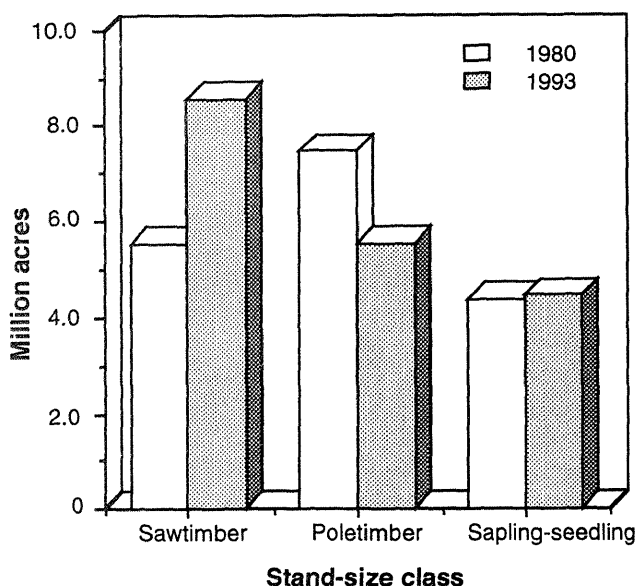


Figure 4.—Area of timberland by stand-size class, Michigan, 1980 and 1993.

## Number of Trees

- The number of growing-stock trees 5 inches and larger in diameter totaled 3.1 billion, an increase of nearly 15 percent from that reported in 1980. The number of trees between 1 and 5 inches in diameter decreased by about 10 percent between 1980 (8.1 billion) and 1993 (7.2 billion). In general, the diameter of the average tree in Michigan grew larger between inventories. In 1993, 9 percent of the trees were 9 inches in diameter and larger, compared to 6 percent in 1980.

## Volume

- Volume of growing stock increased from 19.7 to 26.6 billion cubic feet between 1980 and 1993, a 35-percent gain, as average tree size continued to increase. Hardwoods accounted for 72 percent of the 1993 volume, and softwoods accounted for 28 percent.
- Sawtimber volume increased from 45.5 to 71.0 billion board feet<sup>1</sup> between inventories, a 56-percent gain.
- Growing-stock volume is greatest in the Northern Lower Peninsula (10.1 billion cubic feet), followed by the Western Upper Peninsula (7.2 billion), the Eastern Upper Peninsula (5.1 billion), and the Southern Lower Peninsula (4.2 billion). Volume increased between inventories at the fastest rate in the Southern Lower Peninsula (63 percent), followed by the Northern Lower Peninsula (46 percent), the Eastern Upper Peninsula (24 percent), and the Western Upper Peninsula (18 percent).
- Average growing-stock volume per acre increased from 1,130 cubic feet in 1980 to 1,431 cubic feet in 1993.
- Hard maple had the largest volume of growing stock in both 1980 and 1993 (2.8 billion and 4.0 billion cubic feet, respectively) (figs. 5 and 6). Soft maple ranked second in 1993 with 3.5 billion cubic feet, moving up from third place in 1980. Aspen ranked third in 1993 with 3.2 billion cubic feet, after having ranked second in 1980.

<sup>1</sup> International 1/4-inch rule.

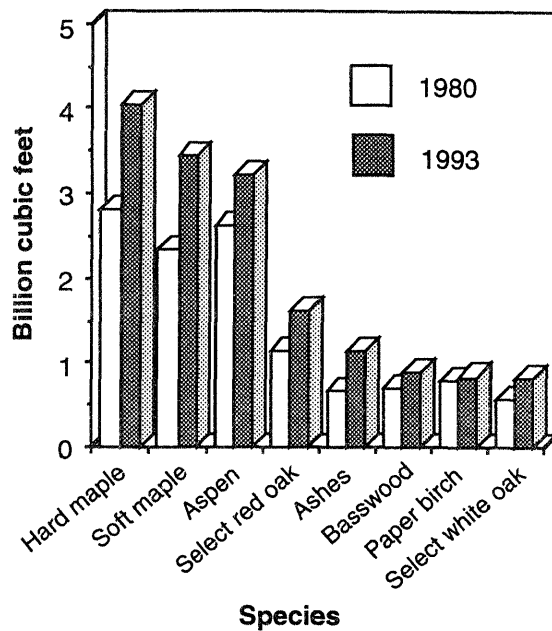


Figure 5.—Net volume of hardwood growing stock on timberland, by species group, Michigan, 1980 and 1993.

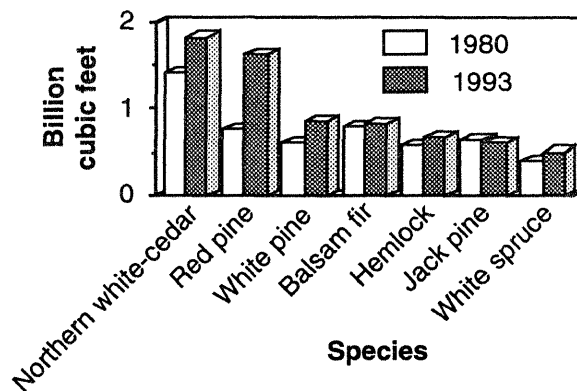


Figure 6.—Net volume of softwood growing stock on timberland, by species group, Michigan, 1980 and 1993.

- The largest volume of growing stock is in trees in the 8- and 10-inch diameter classes (fig. 7). Sixty-four percent of the volume is in trees 12 inches in diameter and smaller. About 7 percent of the total volume is in trees 22 inches in diameter and larger.

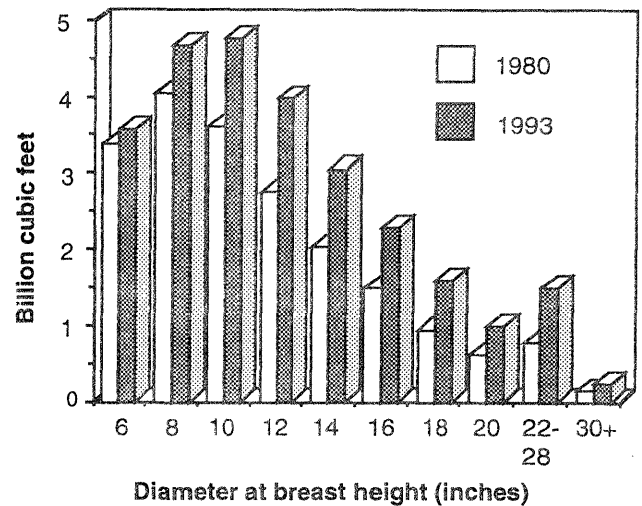


Figure 7.—Net volume of growing stock on timberland by diameter class, Michigan, 1980 and 1993.

- The volume of growing stock is largest in the maple-beech-birch forest type, where it accounts for 44 percent of the total, followed by the aspen type (12 percent), the oak-hickory type (11 percent), the elm-ash-soft maple type (8 percent), and the northern white-cedar type (8 percent).
- Sixty-seven percent of the growing-stock volume is held by private owners. Forty-six percent of the volume is owned by private individuals (fig. 8).

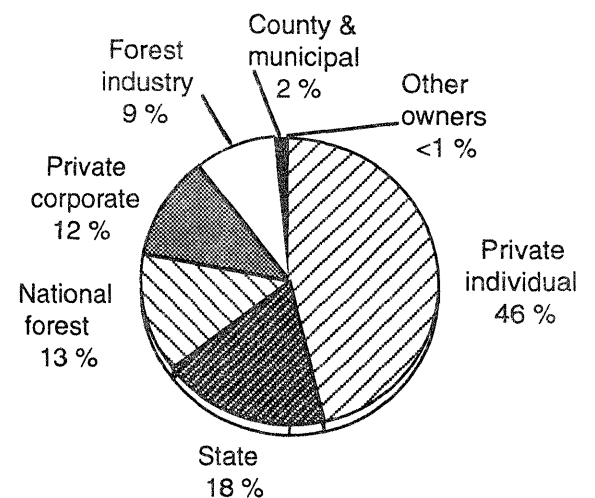


Figure 8.—Net volume of growing stock on timberland by owner class, Michigan, 1993.

- Hard maple accounted for 23 percent of all hardwood sawtimber volume graded as the best quality tree grade, followed by select red oak with 17 percent.
- In addition to the 26.6 billion cubic feet of growing stock, 2.9 billion cubic feet of sound volume is in rough (1.6 billion), short-log (0.6 billion), rotten (0.5 billion), and salvable dead (0.2 billion) trees.

### Growth

- Net annual growth of growing stock on timberland in 1992 (current year growth) was 825.0 million cubic feet (3.1 percent of inventory), compared with 604.9 million cubic feet in 1979 (3.1 percent of inventory). Average growing-stock growth per acre amounted to 44 cubic feet in 1992, compared with 35 cubic feet in 1979.
- Net annual growth of growing stock on timberland averaged 760.4 million cubic feet from 1980 to 1992.
- Potential net annual growth of growing stock for the State is roughly estimated to be 1,170 million cubic feet or 63 cubic feet per acre. This represents a 42-percent increase over the 1992 net annual growth.
- Net annual growth of sawtimber on timberland in 1992 was 3.1 billion board feet (4.3 percent of inventory), compared with 1.8 billion board feet in 1979 (3.9 percent of inventory). Average sawtimber growth per acre amounted to 165 board feet in 1992, compared with 100 board feet in 1979.
- Net annual growth of sawtimber on timberland averaged 2.7 billion board feet from 1980 to 1992.

### Removals

- Annual timber removals from growing stock in 1992 amounted to 360.5 million cubic feet (1.4 percent of inventory), compared with 274.6 million in 1979 (1.4 percent of inventory), a 31-percent increase.
- Total removals in 1992 (360.5 million cubic feet) consisted of 307.2 million cubic feet of removals for roundwood products (85 percent), 31.0 million cubic feet of logging residue (9 percent), and 22.3 million cubic

feet of other removals (6 percent). By comparison, the 1979 total removals (274.6 million cubic feet) consisted of 223.0 million cubic feet of removals for roundwood products (81 percent), 16.8 million cubic feet of logging residue (6 percent), and 34.8 million cubic feet of other removals (13 percent).

- Annual timber removals from growing stock averaged 274.3 million cubic feet from 1980 to 1992.
- Timber removals from growing stock in 1992 represented 44 percent of net annual growth, compared with 45 percent in 1979 (fig. 9).

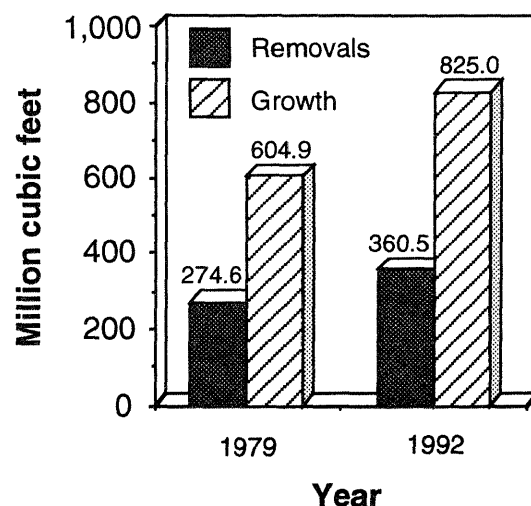


Figure 9.—Comparison of the volumes of annual timber removals with net annual growth, Michigan, 1979 and 1992.

- Annual timber removals from sawtimber in 1992 amounted to 1,100.6 million board feet (1.6 percent of inventory), compared with 915.5 million board feet in 1979 (2.0 percent of inventory).
- Average annual sawtimber removals from 1980 to 1992 was 776.5 million board feet, indicating that removals for both 1979 and 1992 were greater than the average for the period.

### Mortality

- Growing-stock mortality amounted to 200.4 million cubic feet in 1992, or 0.8 percent of

inventory. Mortality averaged 198.5 million cubic feet each year between 1980 and 1992.

- Mortality of sawtimber totaled 470.2 million board feet in 1992, or 0.7 percent of inventory. Mortality averaged 436.0 million board feet each year between inventories.
- Twenty-six percent of the average annual growing-stock mortality volume was aspen (1.6 percent of its inventory). Other species with large volumes of mortality included balsam fir (3.2 percent of its inventory), elm (5.1 percent), jack pine (1.9 percent), and paper birch (1.3 percent).

- Disease is responsible for 58 percent of the average annual growing-stock mortality for which a cause of death could be determined, followed by weather (21 percent), insects (8 percent), human-caused (6 percent), animals (4 percent), and others (3 percent).

### **Biomass**

- Total biomass of all live trees at least 1 inch d.b.h. on timberland amounted to 1.5 billion green tons, an average of 80 green tons per acre. The greatest biomass is from the boles of growing-stock trees larger than 5 inches d.b.h. (57 percent), from the tops and limbs of growing-stock trees larger than 5 inches d.b.h. (16 percent), and from all live trees 1 to 5 inches d.b.h. (12 percent).

## **APPENDIX**

### **ACCURACY OF THE SURVEY**

Forest Inventory and Analysis information is based on a sampling procedure designed to provide reliable statistics at the State and Survey Unit levels. Consequently, the reported figures are estimates only. A measure of reliability of these figures is given by sampling errors. These sampling errors mean that the chances are two out of three that if a 100-percent inventory had been taken, using the same methods, the results would have been within the limits indicated.

For example, the estimated growing-stock volume in the State in 1993, 26,644.9 million cubic feet, has a sampling error of  $\pm 0.67$  percent ( $\pm 178.5$  million cubic feet). The growing-stock volume from a 100-percent inventory would be expected to fall between 26,823.4 and 26,466.4 million cubic feet ( $26,644.9 \pm 178.5$ ), there being a one in three chance that this is not the case.

The following tabulation shows the State total sampling errors for the Michigan forest inventory:

| <b>Item</b>                            | <b>State totals</b>          | <b>Sampling error</b> |
|----------------------------------------|------------------------------|-----------------------|
| Growing stock                          | (Million cubic feet)         | (Percent)             |
| Volume (1993)                          | 26,644.9                     | 0.67                  |
| Average annual growth<br>(1980-1992)   | 760.4                        | 0.91                  |
| Average annual removals<br>(1980-1992) | 274.3                        | 4.02                  |
| Sawtimber                              | (Million board feet)         |                       |
| Volume (1993)                          | 70,971.2                     | 0.94                  |
| Average annual growth<br>(1980-1992)   | 2,665.2                      | 1.06                  |
| Average annual removals<br>(1980-1992) | 776.5                        | 4.73                  |
| Timberland area (1993)                 | (Thousand acres)<br>18,615.9 | 0.34                  |

As survey data are broken down into sections smaller than State totals, the sampling error increases. For example, the sampling error for timberland area in a particular county is higher than that for total timberland area in the State. To estimate sampling error for data smaller than State totals, use the following formula:

$$E = \frac{(SE) \sqrt{(\text{State total volume or area})}}{\sqrt{(\text{Volume or area smaller than State total})}}$$

Where :

E = Sampling error in percent.

SE = State total error for volume or area.

For example, to compute the error on the area of timberland in the maple-beech-birch type for the State, proceed as follows:

- 1) The total area of maple-beech-birch type in the State from table 3 = 7,161.3 thousand acres.
- 2) The total area of all timberland in the State from table 3 = 18,615.9 thousand acres.
- 3) The State total error for timberland area from the above tabulation = 0.34 percent.
- 4) Using the above formula:

$$E = \frac{.0034 \sqrt{18,615.9}}{\sqrt{7,161.3}}$$

E = .0055 or 0.55 percent --  
sampling error for the maple -  
beech - birch forest type in  
Michigan.

### County Data

A standard FIA inventory is designed to provide sampling errors of no more than 3 percent per million acres of timberland or an overall error on Michigan's nearly 18,616 million acres of about 0.7 percent. More accurate survey information was obtained during this survey than otherwise

would have been feasible because of intensified field sampling. Sampling intensity was increased from a single intensity level to a triple intensity level in the Eastern and Western Upper Peninsula Units, increased from a single intensity level to a double intensity level in the Northern Lower Peninsula Unit, and kept at a single intensity level in the Southern Lower Peninsula Unit. The goal was to provide a sampling error of less than 10 percent for total timberland area by county in the Units intensified. Such sampling was made possible through the cooperation, assistance, and additional funding provided by the State of Michigan and Michigan forest industries and associations. In addition, to aid in determining current timber removals, the Michigan Department of Natural Resources surveyed primary wood-using plants in the State. Sampling errors for area, volume, growth, and removals for both growing stock and sawtimber are shown in table 79 for each county in Michigan.

The sampling error within a county depends on county size and total area of timberland. Many large, heavily forested counties in the State have sampling errors well below 5 percent. However, in counties where timberland area is less than 35,000 acres, the sampling error for the total area in timberland will generally exceed 10 percent. The sampling error for total timber volume in a reporting area containing 35,000 acres of timberland will be about 20 percent.

### COMPARING THE FIFTH INVENTORY OF MICHIGAN WITH THE FOURTH INVENTORY

A new volume estimation procedure was developed for the Lake States (see Survey Procedures section), and this procedure was used to compute the 1992 volumes and to recompute the 1980 volume for growth calculations. Although the adjustment will differ by Survey Unit and species, the recomputed 1980 growing-stock and sawtimber volumes will generally be greater than those shown in the 1980 report.

Past surveys used only growing-stock trees to determine stand-size class. Current survey procedures require that stand-size class be determined on the basis of all live trees. Therefore, direct comparisons of current inventory data to old inventory data by stand-size class may be misleading.

The basic building block for estimating forest area and timber volume has been changed from the Survey Unit to the county. In the past, the statistics were developed at the Unit level and prorated back to the county on the basis of photo-interpretation points. Direct development of county-level data helps users interested in more precise local data, but can make the outcome of comparisons with past estimates imprecise.

## SURVEY PROCEDURES

The 1993 Michigan survey used a growth model-enhanced, two-phase sample design. Using this sampling scheme and associated estimators is similar to sampling with partial replacement (SPR), in that a set of randomly located plots is available for remeasurement and a random set of new plots is established and measured. A significant feature of the new Michigan design is stratification for disturbance on the old sample and use of a growth model to improve regression estimates made on old undisturbed forest plots (fig. 10). Detailed descriptions of the sampling and estimation procedures are presented by Hansen (1990). The growth model used in the Michigan survey design was the Lake States Stand and Tree Evaluation and Modeling System (STEMS) (Belcher *et al.* 1982).

## Major Steps in the New Survey Design

### 1. Aerial photography (Phase 1)

In this phase, two sets of random points were located on current aerial photography. The first is a set of new photo plots and the second is a set of relocated old ground plot locations from the 1980 inventory. Aerial photographs used were black and white infrared taken in 1986 at a scale of 1:15,840 (nominal). These photographs were purchased by the Michigan DNR and loaned to the Forest Service. The locations of the plots used in the 1980 inventory were transferred to these new photographs. The photographs were then assembled into township mosaics, and a systematic grid of 121 one-acre photo plots (each plot representing approximately 190.4 acres) was overlaid on each township mosaic. Each of these photo plots was examined by aerial photo interpretation specialists and classified stereoscopically based on land use. If trees were present, forest type and stand-size/density class were recorded. After this examination, all the old "disturbed" sample locations and one-third of the old "undisturbed" forested plots were sent to the field for survey crews to verify the photo classification and to take further measurements. All photo plot locations for the 1993 inventory were examined and were classified as shown in the tabulation on the next page.

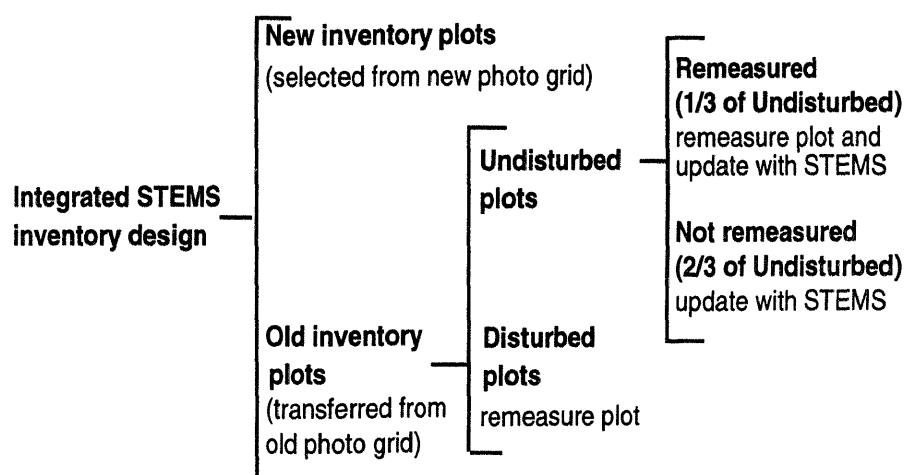


Figure 10.—Overview of the Michigan sample design.

| Photo land class        | Photo plots |
|-------------------------|-------------|
| Timberland              | 97,851      |
| Reserved forest land    | 2,512       |
| Other forest land       | 1,014       |
| Questionable            | 3,036       |
| Nonforest with trees    | 7,438       |
| Nonforest reserved      | 471         |
| Nonforest without trees | 79,425      |
| Water                   | 5,204       |
| All classes             | 196,951     |

## 2. Plot measurements (Phase 2)

On plots classified as timberland, wooded pasture, or windbreak (at least 120 feet wide), a ground plot was established, remeasured, or modeled. Old plots sent to the field for remeasurement that could not be relocated were replaced with a new plot at the approximate location of the old one. Each ground plot consisted of a 10-point cluster covering approximately 1 acre. At each point, trees 5.0 inches or more in d.b.h. were sampled on a 37.5 Basal Area Factor (BAF) variable-radius plot, and trees less than 5.0 inches d.b.h. were sampled on a 1/300-acre fixed-radius plot. The measurement procedures for the new and old sample locations were as follows:

### a) New inventory plots

A systematic sample of the new photo plots was selected for field measurement. Ground plots were established, and measures of current classification such as land use, forest type, and ownership as well as size and condition of all trees on the plot were recorded. These locations were monumented for future remeasurement.

### b) Old inventory plots

These plots were established, monumented, and measured as part of the 1980 field inventory. The procedures for these old plots were different from those for the new plots. Old plots were classed as "undisturbed" or "disturbed" in the aerial photo phase of the sampling process. All disturbed plots and a one-third sample of the undisturbed plots were remeasured to obtain estimates of current condition and changes since the last inventory. All trees measured on these plots in 1980 were remeasured or otherwise accounted for, and all new trees were identified and measured.

All sample plots that were forested at the time of the 1980 inventory and determined to be undisturbed until this inventory were projected to the current time using STEMS. This procedure gives projected estimates of current volume and growth for these undisturbed plots. The comparison of the projected and observed values on the one-third sample of the undisturbed forest plots that were remeasured provided local calibration data to adjust the projected values of the undisturbed plots that were not remeasured. The adjustment procedure is a modified version of the method described by Smith (1983).

The undisturbed forested plots that were not remeasured play a crucial role in the new survey design. These plots, after careful examination comparing past and current aerial photography, were determined to be undisturbed and had conditions that could be simulated by STEMS. The STEMS growth model was used to "grow" the old plot and tree data to produce an estimate of current data. Thus, these plots were treated as ground plots, even though they were never visited. The plot record for each modeled plot was sent to the field for verification of current ownership information.

All old plots classified as disturbed were sent to the field for remeasurement to assess and verify changes since the last inventory. Disturbance refers to any change on a plot that can be detected on aerial photos and that the STEMS growth processor cannot predict, such as catastrophic mortality, cutting, seedling stands, and land use change.

The estimation procedure for computing statistics from this sampling design was more complicated than the simple two-phase estimation procedure used in the past. In fact, this procedure yielded two independent samples, one coming from the new photo points and the other from the old photo points that are remeasured or modeled. The tabulation on the next page summarizes the distribution of all ground plots for the new inventory design by type of plot:

| Ground land use class   | Old plots remeasured | Old plots updated | New plots | Dropped or denied access | Total plots |
|-------------------------|----------------------|-------------------|-----------|--------------------------|-------------|
| Timberland              | 4,180                | 4,021             | 2,023     | 2                        | 10,226      |
| Reserved forest land    | 87                   | 3                 | 472       | 0                        | 562         |
| Other forest land       | 46                   | 1                 | 16        | 1                        | 64          |
| Nonforest with trees    | 372                  | 148               | 147       | 1                        | 668         |
| Nonforest without trees | 1,997                | 3,254             | 1,160     | 1                        | 6,412       |
| Water                   | 99                   | 304               | 154       | 37                       | 594         |
| Other                   | 0                    | 0                 | 0         | 58                       | 58          |
| Total                   | 6,781                | 7,731             | 3,972     | 100                      | 18,584      |

### 3. Area estimates

Area estimates were made using two-phase estimation methods. In this type of estimation, a preliminary estimate of area by land use is made from the aerial photographs (Phase 1) and corrected by the plot measurements (Phase 2). A complete description of this estimation method is presented by Loetsch and Haller (1964).

### 4. Volume estimates

Estimates of volume per acre were made from the trees measured or modeled on the 10-point plots. Estimates of volume per acre were multiplied by the area estimates to obtain estimates of total volume. Net cubic foot volumes are based on a modification of the method presented by Hahn (1984) for use in the Lake States. For the Michigan inventory, the merchantable height equation presented in Hahn (1984) was used in conjunction with Stone's equation (see Appendix I in Hahn, 1984) to estimate gross volume. This estimate was then corrected by species for variation in bark and cull volume to yield an estimate of net volume, using the coefficients presented in Hahn (1984).

The Forest Service reports all board foot volume in International 1/4-inch rule. In Michigan, the Scribner log rule is commonly used. Scribner log rule conversion factors were derived from full tree measurements taken throughout the Lake States (Michigan, Wisconsin, and Minnesota) and an equation developed by Wiant and Castenaeda (1977). The factors (multipliers) used to convert board foot International volumes to the Scribner rule are shown in the following tabulation:

| D.b.h.<br>(inches) | Scribner rule conversion factor |           |
|--------------------|---------------------------------|-----------|
|                    | Softwoods                       | Hardwoods |
| 9.0-10.9           | 0.7830                          | —         |
| 11.0-12.9          | .8287                           | 0.8317    |
| 13.0-14.9          | .8577                           | .8611     |
| 15.0-16.9          | .8784                           | .8827     |
| 17.0-18.9          | .8945                           | .8999     |
| 19.0-20.9          | .9079                           | .9132     |
| 21.0-22.9          | .9168                           | .9239     |
| 23.0-24.9          | .9240                           | .9325     |
| 25.0-26.9          | .9299                           | .9396     |
| 27.0-28.9          | .9321                           | .9454     |
| 29.0+              | .9357                           | .9544     |

### 5. Growth and mortality estimates

On remeasured plots, estimates of growth and mortality per acre come from the remeasured diameters of trees and from observation of trees that died between inventories. Growth reported as the average net annual growth between the two inventories (1980 and 1993) is computed from data on remeasurement plots and modeled plots using methods presented by Van Deusen *et al.* (1986). Mortality is also average net annual for the remeasurement period. On new plots, where trees were not remeasured, estimates of growth and mortality were obtained by using STEMS to project the growth and mortality of trees for 1 year. Growth and mortality estimates for old undisturbed plots that were updated were derived in the same manner as remeasured plots. The STEMS growth model was adjusted by Survey Unit to meet local conditions, using data from the undisturbed remeasurement plots. As with volume, total growth and mortality estimates were obtained by multiplying the per acre estimates by area estimates. Current annual growth for 1992 was computed by using the adjusted STEMS model to grow all current inventory plots for 1 year.

## 6. Average annual removals estimates

Average annual growing-stock and sawtimber removals (1980 to 1992) were estimated only from the remeasured plots; new plots and STEMS-projected plots were not used to estimate removals. These estimates are obtained from trees measured in the last survey and cut or otherwise removed from the timberland base. Because remeasurement plots make up about one-half of the total ground plots, average annual removals estimates have greater sampling errors than volume and growth estimates.

### **Tree and Log Grades**

Log grades and tree grades are based on the classification of external characteristics as indicators of quality. Log grades and or tree grades were taken on approximately one-third of the sample plots in Michigan. All sawtimber softwood sample trees were graded for quality and assigned a butt log grade. All sawtimber hardwood sample trees were graded for quality and assigned a tree grade. The volume yield by

log grade or tree grade for this sample was used to distribute the volume of the ungraded sample trees by species group.

Hardwood sawtimber trees were graded according to "Hardwood Tree Grades for Factory Lumber" (Hanks 1976). The best 12-foot section of the lowest 16-foot hardwood log was used for grading. Hardwood sawtimber trees that did not meet minimum tree grade specifications for grades 1 through 3 were assigned grade 4 according to Forest Service standard specifications for hardwood construction logs described in "A Guide to Hardwood Log Grading" (Rast *et al.* 1973).

Red pine and jack pine sawtimber trees were graded based on specifications described in "Forest Service Log Grades for Southern Pines" (Campbell 1964). White pine and other softwood sawtimber trees were graded according to specifications described by Ostrander and Brisbin (1971). For all softwoods, the first merchantable 16-foot log, or shorter lengths down to 12 feet, was used for grading.

### Hardwood Tree Grade for Factory Lumber <sup>a</sup>

| Grade factor                                                                                             | Tree grade<br>1       | Tree grade<br>2    | Tree grade<br>3 |
|----------------------------------------------------------------------------------------------------------|-----------------------|--------------------|-----------------|
| Length of grading zone (feet)                                                                            | Butt 16               | Butt 16            | Butt 16         |
| Length of grading section <sup>b</sup> (feet)                                                            | Best 12               | Best 12            | Best 12         |
| D.b.h., minimum (inches)                                                                                 | 16 <sup>c</sup>       | 13                 | 11              |
| D.i.b., minimum at top of grading section (inches)                                                       | 13 <sup>c</sup> 16 20 | 11 <sup>d</sup> 12 | 8               |
| Clear cuttings (on the 3 best faces) <sup>e</sup>                                                        |                       |                    |                 |
| Length, minimum (feet)                                                                                   | 7 5 3                 | 3 3                | 2               |
| Number on face (maximum)                                                                                 | 2                     | 2 3                | Unlimited       |
| Yield in face length (minimum)                                                                           | 5/6                   | 4/6                | 3/6             |
| Cull deduction (including crook and sweep, but excluding shake) maximum within grading section (percent) | 9                     | 9 <sup>f</sup>     | 50              |

<sup>a</sup> Hanks (1976).

<sup>b</sup> Whenever a 14- or 16-foot section of the butt 16-foot log is better than the best 12-foot section, the grade of the longer section will become the grade of the tree. This longer section, when used, is the basis for determining the grading factors such as diameter and cull deduction.

<sup>c</sup> In basswood and ash, d.i.b. at top of grading section must be 12 inches and d.b.h. must be 15 inches.

<sup>d</sup> Grade 2 trees can be 10 inches d.i.b. at top of grading section if they otherwise meet surface requirements for small grade 1's.

<sup>e</sup> A clear cutting is a portion of a face free of defects, extending the width of the face. A face is one-fourth of the surface of the grading section as divided lengthwise.

<sup>f</sup> Fifteen percent crook and sweep or 40 percent total cull deduction are permitted in grade 2 trees, if size and surface of grading section qualify as grade 1. If rot shortens the required clear cuttings to the extent of dropping the butt log to grade 2, do not drop the tree's grade to 3 unless the cull deduction for rot is greater than 40 percent.

## Forest Service Standard Grades for Hardwood Factory Saw Logs <sup>a</sup>

| Grading Factors                                                               |                                                            | Log Grades         |                 |     |                  |                 |       |                |
|-------------------------------------------------------------------------------|------------------------------------------------------------|--------------------|-----------------|-----|------------------|-----------------|-------|----------------|
|                                                                               |                                                            | Log grade 1        |                 |     | Log grade 2      |                 |       | Log grade 3    |
|                                                                               |                                                            | Butts only         | Butts & uppers  |     | Butts & uppers   |                 |       | Butts & uppers |
| Position in tree                                                              |                                                            |                    |                 |     |                  |                 |       |                |
| Scaling diameter (inches)                                                     |                                                            | 13-15 <sup>b</sup> | 16-19           | 20+ | 11+ <sup>c</sup> | 12+             |       | 8+             |
| Length without trim (feet)                                                    |                                                            |                    | 10+             |     | 10+              | 8-9             | 10-11 | 12+            |
| Required clear cuttings <sup>d</sup> of each of three best faces <sup>e</sup> | Minimum length, feet                                       | 7                  | 5               | 3   |                  | 3               |       | 2              |
|                                                                               | Maximum number                                             |                    | 2               |     | 2                | 2               | 2     | 3              |
|                                                                               | Minimum proportion of log length required in clear cutting |                    | 5/6             |     | 2/3              | 3/4             | 2/3   | 2/3            |
| Maximum sweep & crook allowance (percent)                                     | For logs with less than one-fourth of end in sound defects |                    | 15              |     |                  | 30              |       | 50             |
|                                                                               | For logs with more than one-fourth of end in sound defects |                    | 10              |     |                  | 20              |       | 35             |
| Maximum scaling deduction (percent)                                           |                                                            |                    | 40 <sup>f</sup> |     |                  | 50 <sup>g</sup> |       | 50             |

<sup>a</sup> Rast *et al.* (1973).

<sup>b</sup> Ash and basswood butts can be 12 inches if they otherwise meet requirements for small #1's.

<sup>c</sup> Ten-inch logs of all species can be #2 if they otherwise meet requirements for small #1's.

<sup>d</sup> A clear cutting is a portion of a face, extending the width of the face, that is free of defects.

<sup>e</sup> A face is one-fourth of the surface of the log as divided lengthwise.

<sup>f</sup> Otherwise #1 logs with 41-60 percent deductions can be #2.

<sup>g</sup> Otherwise #2 logs with 51-60 percent deductions can be #3.

## Forest Service Standard Specifications for Hardwood Construction Logs (tie and timber logs) <sup>a, b</sup>

|                             |                                                                                                                                                                            |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Position in tree            | Butts and uppers                                                                                                                                                           |
| Minimum diameter, small end | 8 inches                                                                                                                                                                   |
| Minimum length without trim | 8 feet                                                                                                                                                                     |
| Clear cuttings              | No requirements                                                                                                                                                            |
| Sweep allowance             | One-fourth of the diameter at the small end for each 8 feet of length.                                                                                                     |
| Sound surface defects:      |                                                                                                                                                                            |
| Single knots                | Any number, if no one knot has an average diameter above the callus in excess of one-third of the log diameter at point of occurrence.                                     |
| Whorled knots               | Any number, if the sum of knot diameters above the callus does not exceed one-third of the log diameter at point of occurrence.                                            |
| Holes                       | Any number, provided none has a diameter over one-third of the log diameter at point of occurrence and none extends more than 3 inches into included timber <sup>c</sup> . |
| Unsound surface defects:    | Same requirements as for sound defects if they extend into included timber.<br>No limit if they do not.                                                                    |

<sup>a</sup> Rast *et al.* (1973).

<sup>b</sup> These specifications are minimum for the class. If, from a group of logs, factory logs are selected first, thus leaving only nonfactory logs from which to select construction logs, then the quality range of the construction logs so selected is limited, and the class may be considered a grade. If selection for construction logs is given first priority, it may be necessary to subdivide the class into grades.

<sup>c</sup> Included timber is always square, and dimension is judged from small end.

### Eastern White Pine Saw Log Grade Specifications <sup>a</sup>

| Grading factor                               | Log grade 1                                                                                                                                          | Log grade 2                                                                                                                                                                                                                                                                                                                                                                           | Log grade 3             | Log grade 4                                                                                                                                                  |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Minimum scaling diameter (inches)         | 14 <sup>b</sup>                                                                                                                                      | 6                                                                                                                                                                                                                                                                                                                                                                                     | 6                       | 6                                                                                                                                                            |
| 2. Minimum log length (feet)                 | 10 <sup>c</sup>                                                                                                                                      | 8                                                                                                                                                                                                                                                                                                                                                                                     | 8                       | 8                                                                                                                                                            |
| 3. Maximum weevil injury (number)            | None                                                                                                                                                 | None                                                                                                                                                                                                                                                                                                                                                                                  | 2 injuries <sup>d</sup> | No limit                                                                                                                                                     |
| 4. Minimum face requirements                 | Two full length or four 50% <sup>e</sup> length good faces (in addition, log knots on balance of faces shall not exceed size limit of grade 2 logs). | <b>NO GOOD FACES REQUIRED</b><br>Maximum diameter of log knots on three best faces:<br><br><b>SOUND RED KNOTS</b><br>not to exceed 1/6 scaling diameter and 3" maximum      not to exceed 1/3 scaling diameter and 5" maximum<br><br><b>OVERGROWN/DEAD/BLACK KNOTS</b><br>not to exceed 1/12 scaling diameter and 1 1/2" max.      not to exceed 1/6 scaling diameter and 2 1/2" max. |                         | Includes all logs not qualifying for No. 3 or better and have at least 1/3 of their gross volume in sound wood suitable for manufacture into standard lumber |
| 5. Maximum sweep or crook (percent)          | 20                                                                                                                                                   | 30                                                                                                                                                                                                                                                                                                                                                                                    | 40                      | 66 2/3                                                                                                                                                       |
| 6. Maximum total scaling deduction (percent) | 50                                                                                                                                                   | 50                                                                                                                                                                                                                                                                                                                                                                                    | 50                      | 66 2/3                                                                                                                                                       |

After the tentative log grade is established from face examination, the log will be reduced in grade whenever the following defects are evident:

7. Conks, punk knots, and pine borer damage on bark surface. <sup>f</sup>  
Degrade one grade if present on one face.  
Degrade two grades if present on two faces.  
Degrade three grades if present on three or more faces.

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8. Log end defects: red rot, ring shake, heavy stain, and pine borer damage outside the heart center of log. <sup>f</sup> Consider log as having a total of 8 quarters (4 on each end) and degrade as indicated.  
Degrade one grade if present in 2 quarters of log ends.  
Degrade two grades if present in 3 or 4 quarters of log ends.  
Degrade three grades if present in 5 or more quarters of log ends.

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a. Ostrander and Brisbin (1971).

b. Twelve- and 13-inch logs with four full-length good faces are acceptable.

c. Eight-foot logs with four full-length good faces are acceptable.

d. Eight-foot Number 3 logs limited to one weevil injury.

e. Minimum 50% length good face must be at least 6 feet.

f. Factors 7 and 8 are not cumulative (total degrade based on more serious of the two). No log is to be degraded below grade 4 if net scale is at least one-third of gross scale.

## Log Grades for Jack Pine and Red Pine <sup>a</sup>

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Grade 1: Trees with three or four clear faces on the 16-foot grading section.<sup>b</sup>

Grade 2: Trees with one or two clear faces on the 16-foot grading section.

Grade 3: Trees with no clear faces on the 16-foot grading section.

After the tentative grade is established from above, the tree will be reduced one grade for each of the following, except that no tree can be reduced below grade 3, provided the total scaling deductions for sweep and/or rot do not exceed two-thirds of the gross scale of the tree.

*Sweep.* Degrade any tentative grade 1 or 2 tree one grade if sweep in the lower 12 feet of grading sections amounts to 3 or more inches and equals or exceeds one-fourth of the diameter at breast height.

*Heart rot.* Degrade any tentative grade 1 or 2 tree one grade if conk, punk knots, massed hyphae, or other evidence of advanced heart rot is found anywhere on the main tree stem.

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<sup>a</sup> Campbell (1964).

<sup>b</sup> A face is one-fourth of the circumference in width extending full length of the grading section. Clear faces are those free of: knots measuring more than one-half inch in diameter, overgrown knots of any size, and holes more than one-fourth inch in diameter. Faces may be rotated to obtain the maximum number of clear on the grading section.

## Log Grades for All Other Softwood Logs

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### Grade 1

1. Trees must be 16 inches in diameter or larger, grading section 12 feet in length or longer, and with deduction for defect not over 30 percent of gross scale.
2. Trees must be at least 75 percent clear on each of three faces.
3. All knots outside clear cutting must be sound and not more than 2-1/2 inches in size.

### Grade 2

1. Trees must be 12 inches in diameter or larger, grading section 12 feet in length or longer, and with a net scale after deduction for defect of at least 50 percent of the gross scale deducted for defect.
2. Trees must be at least 50 percent clear on each of three faces or 75 percent clear on two faces.

### Grade 3

1. Trees must be 6 inches in diameter or larger, grading section 12 feet in length or longer, and with a net scale after deduction for defect of at least 50 percent of the gross contents of the log.

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Note: Diameters are diameter inside bark (d.i.b.) at small end of grading section.  
Percent clear refers to percent clear in one continuous section.

## METRIC EQUIVALENTS OF UNITS USED IN THIS REPORT

- 1 acre = 4,046.86 square meters or 0.405 hectare.  
 1,000 acres = 405 hectares.  
 1 cubic foot = 0.0283 cubic meter.  
 1 foot = 30.48 centimeters or 0.3048 meter.  
 1 inch = 25.4 millimeters, 2.54 centimeters, or 0.0254 meter.  
 1 pound = 0.454 kilograms.  
 1 ton = 0.907 metric tons.

## TREE SPECIES GROUPS IN MICHIGAN (Species names are based on Little, 1981)

### SOFTWOODS

- Eastern white pine ..... *Pinus strobus*  
 Red pine ..... *Pinus resinosa*  
 Jack pine ..... *Pinus banksiana*  
 White spruce ..... *Picea glauca*  
 Black spruce ..... *Picea mariana*  
 Balsam fir ..... *Abies balsamea*  
 Eastern hemlock ..... *Tsuga canadensis*  
 Tamarack ..... *Larix laricina*  
 Northern white-cedar ..... *Thuja occidentalis*  
 Other softwoods  
   Eastern redcedar ..... *Juniperus virginiana*  
   Norway spruce ..... *Picea abies*  
   Engelmann spruce ..... *Picea engelmannii*  
   Austrian pine ..... *Pinus nigra*  
   Scotch pine ..... *Pinus sylvestris*  
   Ponderosa pine ..... *Pinus ponderosa*  
   Blue spruce ..... *Picea pungens*  
   Douglas fir ..... *Pseudotsuga menziesii*

### HARDWOODS

- Select white oaks<sup>2</sup>  
   White oak ..... *Quercus alba*  
   Bur oak ..... *Quercus macrocarpa*  
   Chinkapin oak ..... *Quercus muehlenbergii*  
   Swamp white oak ..... *Quercus bicolor*  
 Other white oaks<sup>2</sup>  
   Chestnut oak ..... *Quercus prinus*  
 Select red oak<sup>2</sup>  
   Northern red oak ..... *Quercus rubra*  
 Other red oaks<sup>2</sup>  
   Scarlet oak ..... *Quercus coccinea*  
   Northern pin oak ..... *Quercus ellipsoidalis*  
   Pin oak ..... *Quercus palustris*  
   Black oak ..... *Quercus velutina*  
 Hickories<sup>2</sup>  
   Shagbark hickory ..... *Carya ovata*  
   Shellbark hickory ..... *Carya laciniata*

- Bitternut hickory ..... *Carya cordiformis*  
 Mockernut hickory ..... *Carya tomentosa*  
 Pignut hickory ..... *Carya glabra*  
 Hard maples<sup>2</sup>  
   Black maple ..... *Acer nigrum*  
   Sugar maple ..... *Acer saccharum*  
 Soft maples<sup>3</sup>  
   Red maple ..... *Acer rubrum*  
   Silver maple ..... *Acer saccharinum*  
 American beech<sup>2</sup> ..... *Fagus grandifolia*  
 Ashes  
   White ash<sup>2</sup> ..... *Fraxinus americana*  
   Black ash<sup>3</sup> ..... *Fraxinus nigra*  
   Green ash<sup>2</sup> ..... *Fraxinus pennsylvanica*  
 Balsam poplar<sup>3</sup> ..... *Populus balsamifera*  
 Aspens<sup>3</sup>  
   Bigtooth aspen ..... *Populus grandidentata*  
   Quaking aspen ..... *Populus tremuloides*  
 Eastern cottonwood<sup>3</sup> ..... *Populus deltoides*  
 American basswood<sup>3</sup> ..... *Tilia americana*  
 Yellow-poplar<sup>3</sup> ..... *Liriodendron tulipifera*  
 Black walnut<sup>2</sup> ..... *Juglans nigra*  
 Black cherry<sup>3</sup> ..... *Prunus serotina*  
 Bitternut<sup>3</sup> ..... *Juglans cinerea*  
 Sycamore<sup>3</sup> ..... *Platanus occidentalis*  
 Elms  
   American elm<sup>3</sup> ..... *Ulmus americana*  
   Siberian elm<sup>3</sup> ..... *Ulmus pumila*  
   Slippery elm<sup>3</sup> ..... *Ulmus rubra*  
   Rock elm<sup>2</sup> ..... *Ulmus thomasi*  
 Birches<sup>3</sup>  
   Yellow birch ..... *Betula alleghaniensis*  
   River birch ..... *Betula nigra*  
   Paper birch ..... *Betula papyrifera*  
 Hackberry<sup>3</sup> ..... *Celtis occidentalis*  
 Black willow<sup>3</sup> ..... *Salix nigra*  
 Black tupelo<sup>3</sup> ..... *Nyssa sylvatica* var. *sylvatica*  
 Other hardwoods  
   Boxelder<sup>3</sup> ..... *Acer negundo*  
   Sweet birch<sup>3</sup> ..... *Betula lenta*  
   Black locust<sup>2</sup> ..... *Robinia pseudoacacia*  
   Red mulberry<sup>3</sup> ..... *Morus rubra*  
   Honeylocust<sup>2</sup> ..... *Gleditsia triacanthos*  
   Northern catalpa<sup>2</sup> ..... *Catalpa speciosa*  
   Ohio buckeye<sup>3</sup> ..... *Aesculus glabra*  
   Flowering dogwood<sup>2</sup> ..... *Cornus florida*  
   Sassafras<sup>3</sup> ..... *Sassafras albidum*  
 Noncommercial species  
   Striped maple ..... *Acer pensylvanicum*  
   Mountain maple ..... *Acer spicatum*  
   Ailanthus ..... *Ailanthus altissima*  
   American hornbeam ..... *Carpinus caroliniana*  
   Hawthorn ..... *Crataegus* spp.

<sup>2</sup> This species or species group is considered a hard  
 hardwood, with an average specific gravity greater  
 than or equal to 0.50.

<sup>3</sup> This species or species group is considered a soft  
 hardwood, with an average specific gravity of less  
 than 0.50.

Osage-orange ..... *Maclura pomifera*  
 Apple ..... *Malus* spp.  
 Eastern hophornbeam ..... *Ostrya virginiana*  
 Pincherry ..... *Prunus pensylvanica*  
 Wild plum ..... *Prunus* spp.  
 Chokecherry ..... *Prunus virginiana*  
 Peachleaf willow ..... *Salix amygdaloides*  
 Diamond willow ..... *Salix bebbiana*  
 American mountain ash ..... *Sorbus americana*

## DEFINITION OF TERMS

### **Average annual mortality of growing**

**stock.**—The average cubic foot volume of sound wood in growing-stock trees that died in 1 year. Average annual mortality is the average for the years between inventories (1980 to 1992 in this report).

### **Average annual mortality of sawtimber.—**

The average board foot volume of sound wood in sawtimber trees that died in 1 year. Average annual mortality is the average for the years between inventories (1980 to 1992 in this report).

### **Average annual removals from growing**

**stock.**—The average net growing-stock volume in growing-stock trees removed annually for roundwood forest products, in addition to the volume of logging residues, and the volume of other removals. Average annual removals of growing stock are the average for the years between inventories (1980 to 1992 in this report) and are based on information obtained from remeasurement plots (see Survey Procedures in Appendix).

### **Average annual removals from sawtimber.—**

The average net board foot sawtimber volume of live sawtimber trees removed annually for roundwood forest products, in addition to the volume of logging residues, and the volume of other removals. Average annual removals of sawtimber are the average for the years between inventories (1980 to 1992 in this report) and are based on information obtained from remeasurement plots (see Survey Procedures in Appendix).

### **Average net annual growth of growing**

**stock.**—The annual change in cubic foot volume of sound wood in live sawtimber and poletimber trees, and the total volume of trees entering these classes through ingrowth, less volume losses resulting from natural causes.

Average net annual growing stock is the average for the years between inventories (1980 to 1992 in this report).

### **Average net annual growth of sawtimber.—**

The annual change in the board foot volume of live sawtimber trees, and the total volume of trees reaching sawtimber size, less volume losses resulting from natural causes. Average net annual growth of sawtimber is the average for the years between inventories (1980 to 1992 in this report).

**Basal area.**—Tree area in square feet of the cross section at breast height of a single tree. When the basal areas of all trees in a stand are summed, the result is usually expressed as square feet of basal area per acre.

**Biomass.**—The aboveground volume of all live trees (including bark but excluding foliage) reported in green tons (i.e., green weight). Biomass has four components:

*Bole.*—Biomass of a tree from 1 foot above the ground to a 4-inch top outside bark.

*Tops and limbs.*—Total biomass of tree from a 1-foot stump minus the bole.

*1- to 5-inch trees.*—Total aboveground biomass of a tree from 1 to 5 inches in diameter at breast height.

*Stump.*—Biomass of a tree 5 inches d.b.h. and larger from the ground to a height of 1 foot.

**Commercial species.**—Tree species presently or prospectively suitable for industrial wood products. (Note: Excludes species of typically small size, poor form, or inferior quality such as hophornbeam, Osage-orange, and redbud.)

**Cord.**—One standard cord is 128 cubic feet of stacked wood, including bark and air space. Cubic feet can be converted to solid wood standard cords by dividing by 79.

**Corporate.**—Lands owned by a private corporation not in the business of operating primary wood-using plants.

**County and municipal land.**—Land owned by counties and local public agencies or municipalities, or land leased to these governmental units for 50 years or more.

**Cropland.**—Land under cultivation within the last 24 months; including cropland harvested,

crop failures, cultivated summer fallow, idle cropland used only for pasture, orchards, and land in soil improvement crops, but excluding land cultivated in developing improved pasture.

**Cull.**—Portions of a tree that are unusable for industrial wood products because of rot, missing or dead material, form, or other defect.

**Current annual growth of growing stock.**—

The annual change in volume of sound wood in live sawtimber and poletimber trees, and the total volume of trees entering these classes through ingrowth, less volume losses resulting from natural causes, reported for a single year (1992 in this report). Current growth is based on an estimate of the current annual increment of each growing-stock tree in the inventory.

**Current annual growth of sawtimber.**—The annual change in the volume of live sawtimber trees, and the total volume of trees reaching sawtimber size, less volume losses resulting from natural causes, reported for a single year (1992 in this report). Current growth is based on an estimate of the current annual increment of each growing-stock tree in the inventory.

**Current annual removals from growing stock.**—

The current net growing-stock volume in growing-stock trees removed annually for roundwood forest products, in addition to the volume of logging residues, and the volume of other removals. Current annual removals of growing stock are reported for a single year (1992 in this report); they are based on a survey of primary wood processing mills to determine removals for products and on information from remeasurement plots (see Survey Procedures in Appendix) to determine removals due to land use change.

**Current annual removals from sawtimber.**—

The current net board foot sawtimber volume of live sawtimber trees removed annually for roundwood forest products, in addition to the volume of logging residues, and the volume of other removals. Current annual removals of sawtimber are reported for a single year (1992 in this report); they are based on a survey of primary wood processing mills to determine removals for products and on information from remeasurement plots (see Survey Procedures in Appendix) to determine removals due to land use change.

**Diameter class.**—A classification of trees based on diameter outside bark, measured at breast height 4.5 feet above the ground.

(Note d.b.h. is the common abbreviation for diameter at breast height.) Two-inch diameter classes are commonly used in Forest Inventory and Analysis, with the even inch the approximate midpoint for a class. For example, the 6-inch class includes trees 5.0 through 6.9 inches d.b.h.

**Diameter at breast height (d.b.h.).**—The outside bark diameter at 4.5 feet (1.37 m) above the forest floor on the uphill side of the tree. For determining breast height, the forest floor includes the duff layer that may be present, but does not include unincorporated woody debris that may rise above the ground line.

**Farm.**—Any place from which \$1,000 or more of agricultural products were produced and sold during the year.

**Farmer-owned land.**—(See Individual private land.)

**Forest industry land.**—Land owned by companies or individuals operating primary wood-using plants.

**Forest land.**—Land at least 16.7 percent stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for nonforest use. (Note: Stocking is measured by comparing specified standards with basal area and/or number of trees, age or size, and spacing.) The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width of at least 120 feet to qualify as forest land. Unimproved roads and trails, streams, or other bodies of water or clearings in forest areas shall be classed as forest if less than 120 feet wide. (See Tree, Land, Timberland, Reserved forest land, Other forest land, Stocking, and Water.)

**Forest type.**—A classification of forest land based on the species forming a plurality of live tree stocking. Major forest types in the State are:

*Jack pine.*—Forests in which jack pine comprises a plurality of the stocking. (Common associates include eastern white pine, red pine, aspen, birch, and maple.)

*Red pine.*—Forests in which red pine comprises a plurality of the stocking. (Common associates include eastern white pine, jack pine, aspen, birch, and maple.)

*White pine.*—Forests in which eastern white pine comprises a plurality of the stocking. (Common associates include red pine, jack pine, aspen, birch, and maple.)

*Balsam fir.*—Forests in which balsam fir and white spruce comprise a plurality of the stocking, with balsam fir the most common. (Common associates include aspen, maple, birch, northern white-cedar, and tamarack.)

*White spruce.*—Forests in which white spruce and balsam fir comprise a plurality of the stocking, with white spruce the most common. (Common associates include aspen, maple, birch, northern white-cedar, and tamarack.)

*Black spruce.*—Forests in which swamp conifers comprise a plurality of the stocking, with black spruce the most common. (Common associates include tamarack and northern white-cedar.)

*Northern white-cedar.*—Forests in which swamp conifers comprise a plurality of the stocking, with northern white-cedar the most common. (Common associates include tamarack and black spruce.)

*Tamarack.*—Forests in which swamp conifers comprise a plurality of the stocking, with tamarack the most common. (Common associates include black spruce and northern white-cedar.)

*Oak-hickory.*—Forests in which northern red oak, white oak, bur oak, or hickories, singly or in combination, comprise a plurality of the stocking. (Common associates include jack pine, elm, and maple.)

*Elm-ash-soft maple.*—Forests in which lowland elm, ash, red maple, silver maple, and cottonwood, singly or in combination, comprise a plurality of the stocking. (Common associates include birches, spruce, and balsam fir.)

*Maple-beech-birch.*—Forests in which sugar maple, yellow birch, upland American elm, and red maple, singly or in combination, comprise a plurality of the stocking. (Common associates include white pine, elm, and basswood.)

*Aspen.*—Forests in which quaking aspen or bigtooth aspen, singly or in combination,

comprise a plurality of the stocking. (Common associates include balsam poplar, balsam fir, and paper birch.)

*Paper birch.*—Forests in which paper birch comprises a plurality of the stocking. (Common associates include maple, aspen, and balsam fir.)

*Balsam poplar.*—Forests in which balsam poplar comprises a plurality of the stocking. (Common associates include aspen, elm, and ash.)

**Growing-stock tree.**—A live tree of commercial species that meets specified standards of size, quality, and merchantability. (Note: Excludes rough, rotten, and dead trees.)

**Growing-stock volume.**—Net volume in cubic feet of growing-stock trees 5.0 inches d.b.h. and over, from 1 foot above the ground to a minimum 4.0-inch top diameter outside bark of the central stem or to the point where the central stem breaks into limbs.

**Hard hardwoods.**—Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maple, hickories, and ash.

**Hardwoods.**—Dicotyledonous trees, usually broad-leaved and deciduous. (See Soft hardwoods and Hard hardwoods.)

**Improved pasture.**—Land currently improved for grazing by cultivating, seeding, irrigating, or clearing trees or brush and less than 16.7 percent stocked with trees.

**Indian land.**—Land held in trust by the United States for tribes or individual Indians.

**Individual private land.**—Privately owned land not owned by forest industry. This class includes the formerly used Farmer and Miscellaneous private classes.

**Industrial wood.**—All roundwood products except residential fuelwood.

**Land.**—A. *Bureau of the Census.* Dry land and land temporarily or partly covered by water such as marshes, swamps, and river flood plains (omitting tidal flats below mean high tide); streams, sloughs, estuaries, and canals less than one-eighth of a statute mile wide; and lakes, reservoirs, and ponds less than 40 acres in area.

*B. Forest Inventory and Analysis.* The same as the Bureau of the Census, except minimum width of streams, etc., is 120 feet and minimum size of lakes, etc., is 1 acre.

**Live trees.**—Growing-stock, rough, and rotten trees 1.0 inch d.b.h. and larger.

**Log grade.**—A log classification based on external characteristics as indicators of quality or value. Log grade was assigned to a sample of softwood sawtimber trees throughout the State during the 1993 inventory. Also see Tree grade. (See Appendix for specific grading factors used.)

**Logging residue.**—The unused portions of cut trees, plus unused trees killed by logging.

**Marsh.**—Nonforest land that characteristically supports low, generally herbaceous or shrubby vegetation, and that is intermittently covered with water.

**Merchantable.**—Refers to a pulpwood or saw-log section that meets pulpwood or saw-log specifications, respectively.

**Miscellaneous Federal land.**—Federal land other than National Forest and land administered by the Bureau of Land Management or Bureau of Indian Affairs.

**Miscellaneous private land.**—(See Individual private land.)

**National Forest land.**—Federal land that has been legally designated as National Forest or purchase units, and other land administered by the USDA Forest Service.

**Net volume.**—Gross volume less deductions for rot, sweep, or other defect affecting use for timber products.

**Noncommercial species.**—Tree species of typically small size, poor form, or inferior quality that normally do not develop into trees suitable for industrial wood products.

**Nonforest land.**—Land that has never supported forests, and land formerly forested where use for timber management is precluded by development for other uses. (Note: Includes areas used for crops, improved pasture, residential areas, city parks, improved roads of any width and adjoining clearings, powerline

clearings of any width, and 1- to 40-acre areas of water classified by the Bureau of the Census as land.) If intermingled in forest areas, unimproved roads and nonforest strips must be more than 120 feet wide and more than 1 acre in area to qualify as nonforest land.

*a. Nonforest land without trees.*—Nonforest land with no live trees present.

*b. Nonforest land with trees.*—Nonforest land with one or more trees per acre at least 5 inches d.b.h.

**Nonstocked land.**—Timberland less than 16.7 percent stocked with all live trees.

**Other forest land.**—Forest land not capable of producing 20 cubic feet per acre per year of industrial wood crops under natural conditions and not associated with urban or rural development. Many of these sites contain tree species that are not currently utilized for industrial wood production or trees of poor form, small size, or inferior quality that are unfit for most industrial products. Unproductivity may be the result of adverse site conditions such as sterile soil, dry climate, poor drainage, high elevation, and rockiness. This land is not withdrawn from timber utilization.

**Other removals.**—Growing-stock trees removed but not utilized for products, or trees left standing but “removed” from the timberland classification by land use change. Examples are removals from cultural operations such as timber stand improvement work and land clearing, and the standing volume on land classified originally as timberland but later designated as reserved from timber harvesting (such as a newly established State park).

**Ownership size class.**—The amount of timberland owned by one owner, regardless of the number of parcels.

**Pasture.**—Land presently used for grazing or under cultivation to develop grazing.

**Physiographic class.**—A measure of soil and water conditions that affect tree growth on a site. The physiographic classes are:

*Xeric sites.*—Very dry soils where excessive drainage seriously limits both growth and species occurrence. Example: sandy jack pine plains.

*Xeromesic sites.*—Moderately dry soils where excessive drainage limits growth and species occurrence to some extent. Example: dry oak ridge.

*Mesic sites.*—Deep, well-drained soils. Growth and species occurrence are limited only by climate. Example: well-drained terraces of loamy soil.

*Hydromesic sites.*—Moderately wet soils where insufficient drainage or infrequent flooding limits growth and species occurrence to some extent. Example: moderately drained bottomland hardwood sites.

*Hydric sites.*—Very wet sites where excess water seriously limits both growth and species occurrence. Example: frequently flooded river bottoms and black spruce swamps.

**Plant byproducts.**—Plant residues used for products such as mulch, pulp chips, and fuelwood.

**Plantation.**—An artificially reforested area sufficiently productive to qualify as timberland. The planted species is not necessarily predominant. Christmas tree plantations, which are considered reserved forest land, are not included.

**Plant residues.**—Wood and bark materials generated at manufacturing plants during production of other products.

**Poletimber stand.**—(See Stand-size class.)

**Poletimber tree.**—A live tree of commercial species at least 5.0 inches d.b.h., but smaller than sawtimber size.

**Potential productivity class.**—A classification of forest land in terms of inherent capacity to grow crops of industrial wood. The class identifies the potential growth in merchantable cubic feet/acre/year at culmination of mean annual increment of fully stocked natural stands.

**Reserved forest land.**—Forest land withdrawn from timber utilization through statute, administrative regulation, designation, or exclusive use for Christmas tree production, as indicated by annual shearing.

**Rotten tree.**—Live trees of commercial species that do not contain at least one 12-foot saw log or two saw logs 8 feet or longer, now or prospectively, and/or do not meet regional

specifications for freedom from defect primarily because of rot; that is, when more than 50 percent of the cull volume in a tree is rotten.

**Rough tree.**—(a) Live trees of commercial species that do not contain at least one merchantable 12-foot saw log or two saw logs 8 feet or longer, now or prospectively, and/or do not meet regional specifications for freedom from defect primarily because of roughness or poor form, and (b) all live trees of noncommercial species.

**Roundwood products.**—Logs, bolts, or other round sections (including chips from roundwood) cut from trees for industrial or consumer uses. (Note: Includes saw logs, veneer logs, and bolts; cooperage logs and bolts; pulpwood; fuelwood; pilings; poles; posts; hewn ties; mine timbers; and various other round, split, or hewn products.)

**Salvable dead tree.**—A standing or down dead tree considered merchantable by regional standards.

**Sapling.**—A live tree 1.0 to 5.0 inches d.b.h.

**Sapling-seedling stand.**—(See Stand-size class.)

**Saw log.**—A log meeting minimum standards of diameter, length, and defect, including logs at least 8 feet long, sound and straight and with a minimum diameter outside bark (d.o.b.) for softwoods of 7.0 inches (9.0 inches for hardwoods) or other combinations of size and defect specified by regional standards.

**Saw-log portion.**—That part of the bole of sawtimber trees between the stump and the saw-log top.

**Saw-log top.**—The point on the bole of sawtimber trees above which a saw log cannot be produced. The minimum saw-log top is 7.0 inches d.o.b. for softwoods and 9.0 inches d.o.b. for hardwoods.

**Sawtimber stand.**—(See Stand-size class.)

**Sawtimber tree.**—A live tree of commercial species containing at least a 12-foot saw log or two noncontiguous saw logs 8 feet or longer, and meeting regional specifications for freedom from defect. Softwoods must be at least 9.0 inches d.b.h. Hardwoods must be at least 11.0 inches d.b.h.

**Sawtimber volume.**—Net volume of the saw-log portion of live sawtimber in board feet, International 1/4-inch rule (unless specified otherwise), from stump to a minimum 7.0 inches top d.o.b. for softwoods and a minimum 9.0 inches top d.o.b. for hardwoods.

**Seedling.**—A live tree less than 1.0 inch d.b.h. that is expected to survive. Only softwood seedlings more than 6 inches tall and hardwood seedlings more than 1 foot tall are counted.

**Short-log (rough tree).**—A sawtimber-size tree of commercial species that contains at least one merchantable 8- to 11-foot saw log but not a 12-foot saw log.

**Shrub.**—A woody, perennial plant differing from a perennial herb in its persistent and woody stem(s) and less definitely from a tree in its lower stature and/or the general absence of a well-defined main stem. For this report, shrubs were separated somewhat arbitrarily into tall and low shrubs as follows:

*Tall shrubs.*—Shrubs normally taller than 1.6 to 3.2 feet.

*Low shrubs.*—Shrubs normally shorter than 1.6 to 3.2 feet. (Woody perennial vines, such as grape, were included with low shrubs.)

**Shrub and tree seedling biomass.**—The total aboveground weight of trees less than 1.0 inch in diameter and all shrubs.

**Site index.**—An expression of forest site quality based on the height of a free-growing dominant or codominant tree of a representative species in the forest type at age 50.

**Soft hardwoods.**—Hardwood species with an average specific gravity less than 0.50, such as cottonwood, red maple, basswood, and willow.

**Softwoods.**—Coniferous trees, usually evergreen, having needles or scale-like leaves.

**Stand.**—A group of trees on a minimum of 1 acre of forest land that is stocked by forest trees of any size.

**Stand-age class.**—A classification based on age of the main stand. Main stand refers to trees of the dominant forest type and stand-size class.

**Stand-size class.**—A classification of stocked (see Stocking) forest land based on the size class of live trees on the area; that is, sawtimber, poletimber, or seedlings and saplings.

*Sawtimber stands.*—Stands with half or more of live tree stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

*Poletimber stands.*—Stands with half or more of live tree stocking in poletimber and/or sawtimber trees, and with poletimber stocking exceeding that of sawtimber.

*Sapling-seedling stands.*—Stands with more than half of the live tree stocking in saplings and/or seedlings.

**State land.**—Land owned by the State of Michigan or leased to it for 50 years or more.

**Stocking.**—The degree of occupancy of land by live trees, measured by basal area and/or the number of trees in a stand by size or age and spacing, compared to the basal area and/or number of trees required to fully utilize the growth potential of the land; that is, the stocking standard. A stocking percent of 100 indicates full utilization of the site and is equivalent to 80 square feet of basal area per acre in trees 5.0 inches d.b.h. and larger. In a stand of trees less than 5 inches d.b.h., a stocking percent of 100 would indicate that the present number of trees is sufficient to produce 80 square feet of basal area per acre when the trees reach 5 inches d.b.h.

Stands are grouped into the following stocking classes:

*Overstocked stands.*—Stands in which stocking of live trees is 133.0 percent or more.

*Fully stocked stands.*—Stands in which stocking of live trees is from 100.0 to 132.9 percent.

*Medium stocked stands.*—Stands in which stocking of live trees is from 60.0 to 99.9 percent.

*Poorly stocked stands.*—Stands in which stocking of live trees is from 16.7 to 59.9 percent.

*Nonstocked areas.*—Timberland on which stocking of live trees is less than 16.7 percent.

**Timber products output.**—All timber products cut from roundwood and byproducts of wood manufacturing plants. Roundwood products

include logs, bolts, or other round sections cut from growing-stock trees, cull trees, salvable dead trees, trees on nonforest land, noncommercial species, sapling-size trees, and limbwood. Byproducts from primary manufacturing plants include slabs, edging, trimmings, miscuts, sawdust, shavings, veneer cores and clippings, and screenings of pulpmills that are used as pulpwood chips or other products.

**Timberland.**—Forest land that is producing, or is capable of producing, more than 20 cubic feet per acre per year of industrial wood crops under natural conditions, that is not withdrawn from timber utilization, and that is not associated with urban or rural development. Currently inaccessible and inoperable areas are included. (Timberland was formerly called commercial forest land.)

**Tree.**—A woody plant usually having one or more perennial stems, a more or less definitely formed crown of foliage, and a height of at least 12 feet at maturity.

**Tree biomass.**—The total aboveground weight (including the bark but excluding the foliage) of all trees from 1 to 5 inches in d.b.h., and the total aboveground weight (including the bark but excluding the foliage) from a 1-foot stump for trees more than 5 inches in diameter.

**Tree grade.**—A classification of the lower 16 feet of the bole of standing trees based on external characteristics as indicators of the quality and quantity of lumber that could be produced from the tree. Tree grade was assigned to a sample of hardwood sawtimber trees during the 1993 inventory. Also see Log grade. (See Appendix for specific grading factors used.)

**Tree size class.**—A classification of trees based on diameter at breast height, including sawtimber trees, poletimber trees, saplings, and seedlings.

**Upper stem portion.**—That part of the bole of sawtimber trees above the saw-log top to a minimum top diameter of 4.0 inches d.o.b. or to the point where the central stem breaks into limbs.

**Urban and other areas.**—Areas within the legal boundaries of cities and towns; suburban areas developed for residential, industrial, or recreational purposes; school yards; cemeteries; roads; railroads; airports; beaches; powerlines and other rights-of-way; or other nonforest land not included in any other specified land use class.

**Urban forest land.**—Land that would otherwise meet the criteria for timberland, but that is in an urban-suburban area surrounded by commercial, industrial, or residential development and not likely to be managed for the production of industrial wood products on a continuing basis. Wood removed would be for land clearing, fuelwood, or esthetic purposes. Such forest land may be associated with industrial, commercial, residential subdivision, industrial parks, golf course perimeters, airport buffer strips, and public urban parks that qualify as forest land.

**Water.**—(a) *Bureau of the Census.*—Permanent inland water surfaces, such as lakes, reservoirs, and ponds at least 40 acres in area; and streams, sloughs, estuaries, and canals at least one-eighth of a statute mile wide.

(b) *Noncensus.*—Permanent inland water surfaces, such as lakes, reservoirs, and ponds from 1 to 39.9 acres in area; and streams, sloughs, estuaries, and canals from 120 feet to one-eighth of a statute mile wide.

**Wooded pasture.**—Improved pasture with more than 16.7 percent stocking in live trees, but less than 25 percent stocking in growing-stock trees. Area is currently improved for grazing or there is other evidence of grazing.

**Wooded strip.**—An acre or more of natural continuous forest land that would otherwise meet survey standards for timberland except that it is less than 120 feet wide.

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## TABLE TITLES

### Core Tables<sup>4</sup>

#### Area

- Table 1.—Area of land by Forest Survey Unit,  
 county, and major land-use class,  
 Michigan, 1993
- Table 2.—Area of timberland by Forest Survey  
 Unit, county, and ownership class,  
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(In thousand acres)

| Forest Survey<br>Unit and county | Total <sup>1</sup><br>land<br>area | Forest land     |            |                         |                      | Other <sup>2</sup><br>land |
|----------------------------------|------------------------------------|-----------------|------------|-------------------------|----------------------|----------------------------|
|                                  |                                    | Total<br>forest | Timberland | Reserved<br>forest land | Other<br>forest land |                            |
| Eastern Upper Peninsula          |                                    |                 |            |                         |                      |                            |
| Alger                            | 587.5                              | 531.6           | 471.4      | 53.6                    | 6.6                  | 55.9                       |
| Chippewa                         | 999.1                              | 749.0           | 707.7      | 27.1                    | 14.2                 | 250.1                      |
| Delta                            | 748.9                              | 602.2           | 595.5      | 1.5                     | 5.2                  | 146.7                      |
| Luce                             | 578.0                              | 472.7           | 463.4      | 3.2                     | 6.1                  | 105.3                      |
| Mackinac                         | 653.8                              | 555.4           | 522.2      | 26.1                    | 7.1                  | 98.4                       |
| Menominee                        | 667.9                              | 524.6           | 523.3      | 1.3                     | -                    | 143.3                      |
| Schoolcraft                      | 754.0                              | 540.5           | 525.4      | 8.1                     | 7.0                  | 213.5                      |
| Total                            | 4,989.2                            | 3,976.0         | 3,808.9    | 120.9                   | 46.2                 | 1,013.2                    |
| Western Upper Peninsula          |                                    |                 |            |                         |                      |                            |
| Baraga                           | 578.7                              | 508.3           | 486.7      | 19.3                    | 2.3                  | 70.4                       |
| Dickinson                        | 490.5                              | 398.2           | 398.2      | -                       | -                    | 92.3                       |
| Gogebic                          | 705.2                              | 635.3           | 608.4      | 26.9                    | -                    | 69.9                       |
| Houghton                         | 647.5                              | 540.4           | 528.9      | 9.9                     | 1.6                  | 107.1                      |
| Iron                             | 746.6                              | 662.3           | 658.0      | -                       | 4.3                  | 84.3                       |
| Keweenaw                         | 346.4                              | 312.1           | 198.5      | 112.3                   | 1.3                  | 34.3                       |
| Marquette                        | 1,165.6                            | 1,027.4         | 1,005.1    | 14.3                    | 8.0                  | 138.2                      |
| Ontonagon                        | 839.4                              | 752.5           | 705.6      | 46.9                    | -                    | 86.9                       |
| Total                            | 5,519.9                            | 4,836.5         | 4,589.4    | 229.6                   | 17.5                 | 683.4                      |
| Northern Lower Peninsula         |                                    |                 |            |                         |                      |                            |
| Alcona                           | 431.7                              | 333.0           | 321.9      | 9.0                     | 2.1                  | 98.7                       |
| Alpena                           | 367.5                              | 236.2           | 233.0      | 3.2                     | -                    | 131.3                      |
| Antrim                           | 305.2                              | 189.7           | 189.7      | -                       | -                    | 115.5                      |
| Arenac                           | 234.8                              | 121.1           | 121.1      | -                       | -                    | 113.7                      |
| Bay                              | 284.3                              | 44.2            | 43.3       | 0.9                     | -                    | 240.1                      |
| Benzie                           | 205.7                              | 146.6           | 136.9      | 9.7                     | -                    | 59.1                       |
| Charlevoix                       | 266.8                              | 172.2           | 170.4      | 1.8                     | -                    | 94.6                       |
| Cheboygan                        | 458.0                              | 350.3           | 339.6      | 9.8                     | 0.9                  | 107.7                      |
| Clare                            | 362.8                              | 245.5           | 245.5      | -                       | -                    | 117.3                      |
| Crawford                         | 357.2                              | 308.1           | 290.0      | 18.1                    | -                    | 49.1                       |
| Emmet                            | 299.5                              | 208.1           | 197.6      | 8.2                     | 2.3                  | 91.4                       |
| Gladwin                          | 324.4                              | 186.9           | 186.9      | -                       | -                    | 137.5                      |
| Grand Traverse                   | 297.7                              | 175.8           | 170.9      | 2.7                     | 2.2                  | 121.9                      |
| Iosco                            | 351.5                              | 244.4           | 242.6      | -                       | 1.8                  | 107.1                      |
| Isabella                         | 367.6                              | 101.6           | 101.6      | -                       | -                    | 266.0                      |
| Kalkaska                         | 359.1                              | 271.1           | 267.4      | 3.7                     | -                    | 88.0                       |
| Lake                             | 363.3                              | 315.2           | 315.2      | -                       | -                    | 48.1                       |
| Leelanau                         | 223.0                              | 126.9           | 88.4       | 38.5                    | -                    | 96.1                       |
| Manistee                         | 348.1                              | 253.3           | 249.1      | 4.2                     | -                    | 94.8                       |
| Mason                            | 316.9                              | 172.7           | 157.0      | 12.9                    | 2.8                  | 144.2                      |
| Mecosta                          | 355.7                              | 163.4           | 163.4      | -                       | -                    | 192.3                      |
| Midland                          | 333.6                              | 175.6           | 175.6      | -                       | -                    | 158.0                      |
| Missaukee                        | 362.7                              | 237.9           | 229.3      | 6.9                     | 1.7                  | 124.8                      |
| Montmorency                      | 350.5                              | 293.8           | 293.6      | 0.2                     | -                    | 56.7                       |
| Newaygo                          | 539.2                              | 331.5           | 330.4      | 1.1                     | -                    | 207.7                      |
| Oceana                           | 345.9                              | 186.9           | 182.0      | 4.9                     | -                    | 159.0                      |
| Ogemaw                           | 361.2                              | 229.1           | 228.5      | 0.6                     | -                    | 132.1                      |
| Osceola                          | 362.3                              | 185.6           | 185.6      | -                       | -                    | 176.7                      |
| Oscoda                           | 361.6                              | 317.2           | 307.9      | 9.3                     | -                    | 44.4                       |
| Otsego                           | 329.3                              | 239.6           | 239.6      | -                       | -                    | 89.7                       |
| Presque Isle                     | 422.4                              | 311.4           | 298.8      | 1.6                     | 11.0                 | 111.0                      |
| Roscommon                        | 333.7                              | 258.0           | 254.8      | 1.5                     | 1.7                  | 75.7                       |
| Wexford                          | 362.0                              | 281.7           | 259.3      | 22.4                    | -                    | 80.3                       |
| Total                            | 11,345.2                           | 7,414.6         | 7,216.9    | 171.2                   | 26.5                 | 3,930.6                    |

(Table 1 continued on next page)

(Table 1 continued)

| Forest Survey<br>Unit and county | Total <sup>1</sup><br>land<br>area | Forest land     |            |                         | Other <sup>2</sup><br>land |          |
|----------------------------------|------------------------------------|-----------------|------------|-------------------------|----------------------------|----------|
|                                  |                                    | Total<br>forest | Timberland | Reserved<br>forest land |                            |          |
| Southern Lower Peninsula         |                                    |                 |            |                         |                            |          |
| Allegan                          | 529.6                              | 179.9           | 178.4      | 1.5                     | -                          | 349.7    |
| Barry                            | 355.9                              | 111.2           | 111.2      | -                       | -                          | 244.7    |
| Berrien                          | 365.5                              | 68.3            | 67.0       | 1.3                     | -                          | 297.2    |
| Branch                           | 324.9                              | 54.4            | 54.4       | -                       | -                          | 270.5    |
| Calhoun                          | 453.7                              | 111.0           | 110.6      | 0.4                     | -                          | 342.7    |
| Cass                             | 315.0                              | 76.9            | 76.9       | -                       | -                          | 238.1    |
| Clinton                          | 365.7                              | 55.4            | 53.8       | 1.6                     | -                          | 310.3    |
| Eaton                            | 369.0                              | 82.1            | 82.1       | -                       | -                          | 286.9    |
| Genesee                          | 409.4                              | 64.9            | 64.9       | -                       | -                          | 344.5    |
| Gratiot                          | 364.9                              | 49.2            | 49.2       | -                       | -                          | 315.7    |
| Hillsdale                        | 383.3                              | 74.1            | 74.1       | -                       | -                          | 309.2    |
| Huron                            | 535.4                              | 66.2            | 64.5       | 1.7                     | -                          | 469.2    |
| Ingham                           | 357.9                              | 62.0            | 62.0       | -                       | -                          | 295.9    |
| Ionia                            | 366.9                              | 74.6            | 74.6       | -                       | -                          | 292.3    |
| Jackson                          | 452.3                              | 82.3            | 82.3       | -                       | -                          | 370.0    |
| Kalamazoo                        | 359.6                              | 79.0            | 75.0       | 4.0                     | -                          | 280.6    |
| Kent                             | 548.0                              | 155.5           | 155.5      | -                       | -                          | 392.5    |
| Lapeer                           | 418.8                              | 110.3           | 109.4      | 0.9                     | -                          | 308.5    |
| Lenawee                          | 480.4                              | 55.2            | 55.2       | -                       | -                          | 425.2    |
| Livingston                       | 363.8                              | 100.0           | 94.1       | 5.9                     | -                          | 263.8    |
| Macomb                           | 307.5                              | 61.4            | 60.6       | 0.8                     | -                          | 246.1    |
| Monroe                           | 352.7                              | 37.9            | 37.9       | -                       | -                          | 314.8    |
| Montcalm                         | 453.2                              | 133.0           | 133.0      | -                       | -                          | 320.2    |
| Muskegon                         | 325.9                              | 162.2           | 159.9      | 2.3                     | -                          | 163.7    |
| Oakland                          | 558.5                              | 137.4           | 111.2      | 26.2                    | -                          | 421.1    |
| Ottawa                           | 362.1                              | 79.1            | 79.1       | -                       | -                          | 283.0    |
| Saginaw                          | 517.7                              | 98.9            | 98.9       | -                       | -                          | 418.8    |
| St. Clair                        | 463.6                              | 79.7            | 78.3       | 1.4                     | -                          | 383.9    |
| St. Joseph                       | 322.4                              | 65.6            | 65.6       | -                       | -                          | 256.8    |
| Sanilac                          | 616.9                              | 79.9            | 79.9       | -                       | -                          | 537.0    |
| Shiawassee                       | 344.9                              | 50.2            | 50.2       | -                       | -                          | 294.7    |
| Tuscola                          | 520.1                              | 115.5           | 115.5      | -                       | -                          | 404.6    |
| Van Buren                        | 391.0                              | 122.3           | 122.3      | -                       | -                          | 268.7    |
| Washtenaw                        | 454.4                              | 82.2            | 82.2       | -                       | -                          | 372.2    |
| Wayne                            | 393.0                              | 35.9            | 30.9       | 5.0                     | -                          | 357.1    |
| Total                            | 14,503.9                           | 3,053.7         | 3,000.7    | 53.0                    | -                          | 11,450.2 |
| All counties                     | 36,358.2                           | 19,280.8        | 18,615.9   | 574.7                   | 90.2                       | 17,077.4 |

<sup>1</sup>From U. S. Bureau of the Census, 1990.<sup>2</sup>includes 183.5 thousand acres of water according to FIA standards of area classification, but defined by the Bureau of the Census as land.

Table 2. -- Area of timberland by Forest Survey Unit, county, and ownership class, Michigan, 1993

| Forest Survey Unit and county   | (in thousand acres) |                 |               |                |                      |            |                 | Forest         |              |  |
|---------------------------------|---------------------|-----------------|---------------|----------------|----------------------|------------|-----------------|----------------|--------------|--|
|                                 | All ownerships      | National forest | Other federal | State          | County and municipal | Indian     | Forest industry | Individual     | Corporate    |  |
| <b>Eastern Upper Peninsula</b>  |                     |                 |               |                |                      |            |                 |                |              |  |
| Alger                           | 471.4               | 105.3           | 4.0           | 81.3           | -                    | -          | 33.6            | 90.8           | 156.4        |  |
| Chippewa                        | 707.7               | 210.4           | 0.9           | 155.8          | 1.1                  | 1.3        | 57.4            | 227.9          | 52.9         |  |
| Delta                           | 595.5               | 218.9           | 1.5           | 61.7           | 4.9                  | -          | 68.4            | 220.0          | 20.1         |  |
| Luce                            | 463.4               | -               | -             | 215.4          | -                    | -          | 84.0            | 115.6          | 48.4         |  |
| Mackinac                        | 522.2               | 123.6           | -             | 165.1          | 1.7                  | -          | 20.6            | 166.6          | 44.6         |  |
| Menominee                       | 523.3               | -               | -             | 72.6           | 2.3                  | 6.9        | 118.1           | 303.8          | 19.6         |  |
| Schoolcraft                     | 525.4               | 105.7           | 14.1          | 185.3          | 2.7                  | -          | 40.3            | 117.2          | 60.1         |  |
| <b>Total</b>                    | <b>3,808.9</b>      | <b>763.9</b>    | <b>20.5</b>   | <b>937.2</b>   | <b>12.7</b>          | <b>8.2</b> | <b>422.4</b>    | <b>1,241.9</b> | <b>402.1</b> |  |
| <b>Western Upper Peninsula</b>  |                     |                 |               |                |                      |            |                 |                |              |  |
| Baraga                          | 486.7               | 33.7            | 10.1          | 57.9           | 1.3                  | 6.4        | 252.4           | 101.0          | 23.9         |  |
| Dickinson                       | 398.2               | -               | 1.6           | 195.9          | 4.0                  | -          | 38.6            | 123.3          | 34.8         |  |
| Gogebic                         | 608.4               | 267.1           | -             | 2.7            | 57.7                 | -          | 123.7           | 91.0           | 66.2         |  |
| Houghton                        | 528.9               | 141.5           | -             | 40.3           | 5.8                  | -          | 89.6            | 150.1          | 101.6        |  |
| Iron                            | 658.0               | 169.0           | -             | 73.8           | 3.1                  | -          | 95.9            | 162.8          | 153.4        |  |
| Keweenaw                        | 198.5               | -               | 1.3           | 1.2            | -                    | -          | 160.3           | 19.7           | 16.0         |  |
| Marquette                       | 1,005.1             | 5.0             | 1.4           | 224.5          | 14.2                 | -          | 171.4           | 295.4          | 293.2        |  |
| Ontonagon                       | 705.6               | 247.1           | 2.7           | 20.4           | 3.9                  | -          | 153.8           | 133.4          | 144.3        |  |
| <b>Total</b>                    | <b>4,589.4</b>      | <b>863.4</b>    | <b>17.1</b>   | <b>616.7</b>   | <b>90.0</b>          | <b>6.4</b> | <b>1,085.7</b>  | <b>1,076.7</b> | <b>833.4</b> |  |
| <b>Northern Lower Peninsula</b> |                     |                 |               |                |                      |            |                 |                |              |  |
| Alcona                          | 321.9               | 101.8           | -             | 2.1            | 6.6                  | -          | -               | 164.3          | 47.1         |  |
| Alpena                          | 233.0               | -               | -             | 36.8           | 2.4                  | -          | -               | 156.0          | 37.8         |  |
| Antrim                          | 189.7               | -               | -             | 51.1           | 6.4                  | -          | -               | 121.7          | 10.5         |  |
| Arenac                          | 121.1               | -               | -             | 34.3           | 1.8                  | -          | -               | 81.5           | 3.5          |  |
| Bay                             | 43.3                | -               | -             | -              | -                    | -          | -               | 43.3           | -            |  |
| Benzle                          | 136.9               | -               | -             | 66.5           | -                    | -          | -               | 62.4           | 8.0          |  |
| Charlevoix                      | 170.4               | -               | -             | 62.3           | -                    | -          | -               | 92.5           | 15.6         |  |
| Cheboygan                       | 339.6               | -               | -             | 168.2          | -                    | -          | -               | 154.1          | 17.3         |  |
| Clare                           | 245.5               | -               | 4.1           | 53.3           | -                    | -          | -               | 158.1          | 30.0         |  |
| Crawford                        | 290.0               | 35.9            | 2.1           | 151.9          | -                    | -          | -               | 95.8           | 4.3          |  |
| Emmet                           | 197.6               | -               | -             | 75.1           | 4.9                  | -          | -               | 108.1          | 9.5          |  |
| Gladwin                         | 186.9               | -               | -             | 75.4           | 4.4                  | -          | -               | 104.0          | 3.1          |  |
| Grand Traverse                  | 170.9               | -               | -             | 70.6           | 4.4                  | -          | -               | 89.3           | 6.6          |  |
| Iosco                           | 242.6               | 107.8           | -             | 15.2           | -                    | -          | -               | 98.7           | 20.9         |  |
| Isabella                        | 101.6               | -               | -             | 3.2            | -                    | -          | -               | 93.9           | 4.5          |  |
| Kalkaska                        | 267.4               | -               | -             | 144.1          | -                    | -          | -               | 105.6          | 17.7         |  |
| Lake                            | 315.2               | 111.9           | 1.7           | 63.5           | -                    | -          | -               | 125.0          | 13.1         |  |
| Leelanau                        | 88.4                | -               | -             | 5.9            | -                    | -          | -               | 77.2           | 5.3          |  |
| Manistee                        | 249.1               | 82.1            | -             | 15.0           | 10.7                 | -          | -               | 110.9          | 30.4         |  |
| Mason                           | 157.0               | 47.8            | -             | 7.0            | 3.4                  | -          | 5.6             | 85.4           | 7.8          |  |
| Mecosta                         | 163.4               | -               | -             | 20.7           | 7.1                  | -          | -               | 129.8          | 5.8          |  |
| Midland                         | 175.6               | -               | -             | 47.0           | 1.6                  | -          | 0.6             | 119.3          | 7.1          |  |
| Missaukee                       | 229.3               | -               | -             | 106.6          | -                    | -          | -               | 99.6           | 23.1         |  |
| Montmorency                     | 293.6               | -               | -             | 148.1          | -                    | -          | -               | 123.9          | 21.6         |  |
| Newaygo                         | 330.4               | 107.0           | -             | 4.0            | 2.3                  | -          | -               | 208.5          | 8.6          |  |
| Oceana                          | 182.0               | 52.7            | -             | 1.8            | 2.3                  | -          | -               | 111.2          | 14.0         |  |
| Ogemaw                          | 228.5               | 20.1            | -             | 65.9           | 5.1                  | -          | -               | 118.9          | 18.5         |  |
| Osceola                         | 185.6               | -               | -             | 20.9           | 1.7                  | -          | -               | 149.4          | 13.6         |  |
| Oscoda                          | 307.9               | 141.2           | -             | 42.4           | -                    | -          | -               | 77.1           | 47.2         |  |
| Oshtemo                         | 239.6               | -               | -             | 82.2           | -                    | -          | -               | 130.1          | 25.4         |  |
| Presque Isle                    | 298.8               | -               | 1.9           | 66.0           | 1.2                  | -          | -               | 183.9          | 45.5         |  |
| Roscommon                       | 254.8               | -               | 2.2           | 168.3          | 1.7                  | -          | -               | 52.8           | 32.0         |  |
| Wexford                         | 259.3               | 92.6            | -             | 60.9           | -                    | -          | -               | 94.5           | 11.3         |  |
| <b>Total</b>                    | <b>7,216.9</b>      | <b>900.9</b>    | <b>12.0</b>   | <b>1,936.3</b> | <b>68.0</b>          | <b>-</b>   | <b>6.2</b>      | <b>3,726.8</b> | <b>566.7</b> |  |

(Table 2 continued on next page)

(Table 2 continued)

| Forest Survey<br>Unit and county | All<br>ownerships | National<br>forest | Other<br>federal | State   | County and<br>municipal | Indian | Forest<br>industry | Individual | Corporate |
|----------------------------------|-------------------|--------------------|------------------|---------|-------------------------|--------|--------------------|------------|-----------|
| <b>Southern Lower Peninsula</b>  |                   |                    |                  |         |                         |        |                    |            |           |
| Allegan                          | 178.4             | -                  | -                | 55.8    | -                       | -      | -                  | 114.6      | 8.0       |
| Barry                            | 111.2             | -                  | -                | 19.8    | -                       | -      | -                  | 91.4       | -         |
| Berrien                          | 67.0              | -                  | -                | 2.7     | 9.6                     | -      | -                  | 49.3       | 5.4       |
| Branch                           | 54.4              | -                  | -                | -       | 3.0                     | -      | -                  | 51.4       | -         |
| Calhoun                          | 110.6             | -                  | -                | -       | -                       | -      | -                  | 103.0      | 7.6       |
| Cass                             | 76.9              | -                  | -                | -       | -                       | -      | -                  | 68.8       | 8.1       |
| Clinton                          | 53.8              | -                  | -                | -       | 2.6                     | -      | -                  | 43.8       | 7.4       |
| Eaton                            | 82.1              | -                  | -                | -       | -                       | -      | -                  | 53.2       | 28.9      |
| Genesee                          | 64.9              | -                  | -                | -       | 3.7                     | -      | -                  | 61.2       | -         |
| Gratiot                          | 49.2              | -                  | -                | 7.3     | -                       | -      | -                  | 41.9       | -         |
| Hillsdale                        | 74.1              | -                  | -                | -       | -                       | -      | -                  | 74.1       | -         |
| Huron                            | 64.5              | -                  | -                | 9.7     | 2.8                     | -      | -                  | 52.0       | -         |
| Ingham                           | 62.0              | -                  | -                | 3.6     | -                       | -      | -                  | 54.7       | 3.7       |
| Ionia                            | 74.6              | -                  | -                | 4.0     | 3.8                     | -      | -                  | 66.8       | -         |
| Jackson                          | 82.3              | -                  | -                | 13.1    | 2.6                     | -      | -                  | 58.5       | 8.1       |
| Kalamazoo                        | 75.0              | -                  | -                | 6.2     | 5.8                     | -      | -                  | 63.0       | -         |
| Kent                             | 155.5             | -                  | -                | 1.5     | -                       | -      | -                  | 145.7      | 8.3       |
| Lapeer                           | 109.4             | -                  | -                | 15.8    | 2.9                     | -      | -                  | 80.3       | 10.4      |
| Lenawee                          | 55.2              | -                  | -                | -       | -                       | -      | -                  | 53.0       | 2.2       |
| Livingston                       | 94.1              | -                  | -                | 5.6     | -                       | -      | -                  | 70.9       | 17.6      |
| Macomb                           | 60.6              | -                  | -                | 2.4     | 9.0                     | -      | -                  | 19.7       | 29.5      |
| Monroe                           | 37.9              | -                  | -                | 1.5     | -                       | -      | -                  | 30.1       | 6.3       |
| Montcalm                         | 133.0             | 1.8                | -                | 18.5    | 5.9                     | -      | -                  | 96.5       | 10.3      |
| Muskegon                         | 159.9             | 12.4               | -                | 8.8     | 21.8                    | -      | -                  | 101.4      | 15.5      |
| Oakland                          | 111.2             | -                  | -                | -       | -                       | -      | -                  | 79.2       | 32.0      |
| Ottawa                           | 79.1              | -                  | -                | -       | 5.1                     | -      | -                  | 65.0       | 9.0       |
| Saginaw                          | 98.9              | -                  | -                | 9.6     | -                       | -      | -                  | 89.3       | -         |
| St. Clair                        | 78.3              | -                  | -                | 11.0    | -                       | -      | -                  | 51.1       | 16.2      |
| St. Joseph                       | 65.6              | -                  | -                | 4.6     | -                       | -      | -                  | 61.0       | -         |
| Sanilac                          | 79.9              | -                  | -                | 2.9     | -                       | -      | -                  | 68.3       | 8.7       |
| Shiawassee                       | 50.2              | -                  | -                | -       | -                       | -      | -                  | 47.2       | 3.0       |
| Tuscola                          | 115.5             | -                  | -                | 21.2    | -                       | -      | -                  | 94.3       | -         |
| Van Buren                        | 122.3             | -                  | -                | -       | 1.1                     | -      | -                  | 117.9      | 3.3       |
| Washtenaw                        | 82.2              | -                  | -                | 12.4    | 3.5                     | -      | -                  | 59.5       | 6.8       |
| Wayne                            | 30.9              | -                  | -                | -       | 2.4                     | -      | -                  | 25.0       | 3.5       |
| Total                            | 3,000.7           | 14.2               | -                | 238.0   | 85.6                    | -      | -                  | 2,403.1    | 259.8     |
| All counties                     | 18,615.9          | 2,542.4            | 49.6             | 3,728.2 | 256.3                   | 14.6   | 1,514.3            | 8,448.5    | 2,062.0   |

Table 3. -- Area of timberland by Forest Survey Unit, county, and forest type group/local type, Michigan, 1993

(In thousand acres)

| Forest Survey Unit and county | Forest type group/local type |                     |           |          |            |         |            |              |              |                      |          |                   |                    |                   |             | Non-stocked |       |       |
|-------------------------------|------------------------------|---------------------|-----------|----------|------------|---------|------------|--------------|--------------|----------------------|----------|-------------------|--------------------|-------------------|-------------|-------------|-------|-------|
|                               | All types                    | White-red/jack pine |           |          |            |         | Spruce-fir |              |              | Oak-hickory          |          | Maple-beech-birch |                    |                   | Aspen-birch |             |       |       |
|                               |                              | Total               | Jack pine | Red pine | White pine | Total   | Balsam fir | White spruce | Black spruce | Northern white-cedar | Tamarack | Oak-hickory       | Elm-ash-cottonwood | Maple-beech-birch |             |             | Total | Aspen |
| Eastern Upper Peninsula       |                              |                     |           |          |            |         |            |              |              |                      |          |                   |                    |                   |             |             |       |       |
| Alger                         | 471.4                        | 50.7                | 6.2       | 28.4     | 14.1       | 65.0    | 13.4       | 5.3          | 11.6         | 34.7                 | -        | -                 | 20.2               | 314.4             | 19.0        | 16.4        | 1.3   | 1.3   |
| Chippewa                      | 707.7                        | 104.4               | 70.1      | 23.3     | 11.0       | 216.4   | 47.9       | 17.5         | 46.9         | 89.7                 | 14.4     | 16.4              | 38.9               | 168.2             | 163.4       | 129.0       | 14.4  | 20.0  |
| Delta                         | 595.5                        | 45.1                | 14.8      | 28.3     | 2.0        | 233.0   | 51.9       | 13.8         | 35.5         | 124.8                | 7.0      | 7.5               | 40.6               | 138.3             | 131.0       | 87.9        | 7.8   | 35.3  |
| Luce                          | 483.4                        | 76.7                | 45.5      | 19.0     | 12.2       | 126.6   | 10.5       | -            | 43.9         | 65.1                 | 7.1      | 3.0               | 18.6               | 201.9             | 33.9        | 30.1        | 2.1   | 1.7   |
| Mackinac                      | 522.2                        | 49.0                | 9.8       | 29.8     | 9.4        | 202.2   | 47.8       | 15.4         | 27.6         | 107.9                | 3.5      | -                 | 22.5               | 129.0             | 117.1       | 73.9        | 19.7  | 23.5  |
| Menominee                     | 523.3                        | 13.1                | 1.2       | 3.4      | 8.5        | 201.6   | 34.8       | 6.7          | 19.6         | 126.0                | 14.5     | 6.5               | 56.9               | 138.8             | 105.3       | 70.4        | 21.1  | 13.8  |
| Schoolcraft                   | 525.4                        | 82.3                | 45.4      | 26.0     | 10.9       | 169.5   | 26.3       | 3.4          | 47.1         | 84.7                 | 8.0      | 4.2               | 23.0               | 173.7             | 72.7        | 52.6        | 13.4  | 6.7   |
| Total                         | 3,808.9                      | 421.3               | 195.0     | 158.2    | 68.1       | 1,214.3 | 232.6      | 62.1         | 232.2        | 632.9                | 54.5     | 37.6              | 220.7              | 1,264.3           | 642.4       | 460.3       | 79.8  | 102.3 |
| Western Upper Peninsula       |                              |                     |           |          |            |         |            |              |              |                      |          |                   |                    |                   |             |             |       |       |
| Baraga                        | 486.7                        | 12.1                | 7.2       | 3.6      | 1.3        | 96.4    | 31.8       | 1.0          | 24.9         | 32.8                 | 5.9      | 0.6               | 17.3               | 320.4             | 39.9        | 33.8        | 5.0   | 1.1   |
| Dickinson                     | 398.2                        | 16.9                | 3.0       | 6.3      | 7.6        | 127.2   | 40.5       | 4.0          | 25.6         | 53.9                 | 3.2      | 4.2               | 15.7               | 114.8             | 119.4       | 99.4        | 7.6   | 12.4  |
| Gogebic                       | 608.4                        | 17.9                | -         | 17.9     | -          | 95.1    | 35.5       | 9.7          | 10.8         | 29.3                 | 9.8      | 2.7               | 49.4               | 376.8             | 64.8        | 60.9        | 3.9   | -     |
| Houghton                      | 531.9                        | 30.6                | 13.3      | 15.7     | 1.6        | 53.1    | 20.1       | 5.4          | 4.6          | 16.6                 | 6.4      | 2.4               | 22.3               | 361.7             | 58.8        | 51.0        | 7.8   | -     |
| Iron                          | 658.0                        | 30.9                | 1.2       | 18.7     | 11.0       | 158.1   | 58.8       | 8.7          | 49.4         | 25.0                 | 16.2     | 2.9               | 4.8                | 307.3             | 154.0       | 123.1       | 23.4  | 7.5   |
| Keweenaw                      | 198.5                        | 3.5                 | -         | -        | 3.5        | 63.1    | 11.9       | 4.9          | 5.2          | 41.1                 | -        | 4.2               | 5.6                | 95.1              | 27.0        | 13.5        | 13.5  | -     |
| Marquette                     | 1,005.1                      | 94.5                | 62.6      | 19.9     | 9.2        | 231.6   | 52.1       | 9.4          | 79.1         | 84.1                 | 6.9      | 10.7              | 46.8               | 454.6             | 161.9       | 127.1       | 31.5  | 5.0   |
| Ontonagon                     | 705.6                        | 24.9                | -         | 15.7     | 9.2        | 42.4    | 17.2       | 8.1          | 8.6          | 8.5                  | -        | 1.3               | 27.1               | 435.1             | 174.8       | 167.8       | 5.2   | 1.8   |
| Total                         | 4,589.4                      | 231.3               | 87.3      | 97.8     | 46.2       | 867.0   | 267.9      | 51.2         | 208.2        | 291.3                | 48.4     | 29.0              | 189.0              | 2,465.8           | 800.6       | 676.6       | 97.9  | 26.1  |
| Northern Lower Peninsula      |                              |                     |           |          |            |         |            |              |              |                      |          |                   |                    |                   |             |             |       |       |
| Alcona                        | 321.9                        | 33.6                | 8.0       | 20.8     | 4.8        | 51.2    | 6.2        | 5.4          | 2.6          | 34.9                 | 2.1      | 88.7              | 8.4                | 39.2              | 100.4       | 88.4        | 2.1   | 9.9   |
| Alpena                        | 233.0                        | 18.6                | 7.4       | 7.1      | 4.1        | 53.6    | 13.3       | 2.4          | -            | 36.8                 | 1.1      | 8.1               | 27.2               | 36.8              | 87.0        | 66.7        | 14.9  | 5.4   |
| Antrim                        | 189.7                        | 14.0                | 6.8       | 7.2      | -          | 15.2    | -          | -            | -            | 15.2                 | -        | -                 | 6.1                | 126.4             | 28.0        | 28.0        | -     | -     |
| Arenac                        | 121.1                        | 5.0                 | 5.0       | -        | -          | 2.8     | 1.8        | 1.0          | -            | -                    | -        | 26.6              | 25.2               | 23.4              | 38.1        | 35.2        | 2.9   | -     |
| Bay                           | 43.3                         | -                   | -         | -        | -          | -       | -          | -            | -            | -                    | -        | -                 | 19.6               | 8.4               | 15.3        | 15.3        | -     | -     |
| Benzie                        | 136.9                        | 17.0                | 3.3       | 13.7     | -          | 5.6     | -          | 2.3          | -            | 3.3                  | -        | -                 | 12.2               | 93.0              | 9.1         | 9.1         | -     | -     |
| Charlevoix                    | 170.4                        | 16.6                | -         | 7.8      | 8.8        | 30.3    | 2.1        | -            | -            | 19.3                 | 8.7      | -                 | 6.2                | 107.3             | 10.0        | 5.3         | 4.7   | -     |
| Cheboygan                     | 339.6                        | 36.6                | 17.5      | 16.8     | 2.3        | 34.7    | 2.7        | 1.2          | 2.3          | 28.5                 | -        | 14.9              | 16.2               | 122.1             | 115.1       | 107.5       | 3.6   | 4.0   |
| Clare                         | 245.5                        | 39.9                | 24.5      | 15.4     | -          | 5.3     | -          | -            | -            | 3.8                  | 1.5      | 46.3              | 33.4               | 57.1              | 63.5        | 63.5        | -     | -     |
| Crawford                      | 290.0                        | 108.2               | 89.3      | 16.8     | 2.1        | 16.7    | -          | -            | 10.3         | 6.4                  | -        | 73.4              | 2.2                | 42.7              | 46.8        | 40.4        | 4.3   | 2.1   |
| Emmet                         | 197.6                        | 14.6                | 7.0       | 7.6      | -          | 15.2    | 1.3        | 1.7          | -            | 12.2                 | -        | 1.8               | 10.2               | 118.8             | 37.0        | 31.1        | 5.9   | -     |
| Gladwin                       | 186.9                        | 8.0                 | 1.9       | 6.1      | -          | -       | -          | -            | -            | -                    | -        | 26.2              | 29.6               | 33.7              | 89.4        | 80.0        | -     | 9.4   |
| Grand Traverse                | 170.9                        | 51.9                | 13.3      | 36.4     | 2.2        | 9.2     | -          | -            | -            | 7.0                  | 2.2      | 30.8              | 4.4                | 42.3              | 32.3        | 27.9        | 4.4   | -     |
| Iscos                         | 242.6                        | 89.2                | 40.5      | 42.3     | 6.4        | 27.0    | -          | -            | -            | 21.8                 | 5.2      | 23.8              | 25.4               | 30.7              | 46.5        | 35.3        | 4.6   | 6.6   |
| Isabella                      | 101.6                        | 7.0                 | 4.0       | 2.5      | 0.5        | 2.4     | -          | -            | -            | 2.4                  | -        | 15.3              | 14.0               | 25.1              | 37.8        | 35.7        | 2.1   | -     |
| Kalkaska                      | 287.4                        | 65.9                | 26.8      | 37.1     | 2.0        | 17.7    | 2.0        | -            | -            | 15.7                 | -        | 12.1              | 9.2                | 121.4             | 47.8        | 44.7        | 3.1   | -     |
| Lake                          | 315.2                        | 74.7                | 21.3      | 44.7     | 8.7        | 8.3     | -          | -            | -            | 8.3                  | -        | 150.9             | 9.2                | 42.4              | 29.7        | 29.7        | -     | 2.5   |
| Leelanau                      | 88.4                         | 17.0                | -         | 10.9     | 6.1        | 4.9     | -          | -            | -            | 4.9                  | -        | -                 | 3.4                | 55.1              | 8.0         | 5.7         | 2.3   | -     |
| Manistee                      | 249.1                        | 47.4                | 10.6      | 32.9     | 3.9        | 4.8     | -          | -            | -            | 4.8                  | -        | 53.5              | 23.5               | 88.6              | 31.3        | 29.8        | 1.5   | -     |
| Mason                         | 157.0                        | 34.1                | 8.8       | 24.7     | 0.6        | -       | -          | -            | -            | -                    | -        | 54.0              | 22.8               | 23.6              | 22.5        | 22.5        | -     | -     |
| Mecosta                       | 163.4                        | 11.0                | 4.3       | 5.5      | 1.2        | 5.1     | -          | 1.3          | -            | 3.8                  | -        | 13.5              | 23.9               | 71.5              | 38.4        | 36.8        | 1.6   | -     |
| Midland                       | 175.6                        | 0.6                 | -         | -        | 0.6        | -       | -          | -            | -            | -                    | -        | 27.9              | 38.7               | 49.3              | 59.1        | 53.3        | 5.8   | -     |
| Missaukee                     | 229.3                        | 29.8                | 12.8      | 17.0     | -          | 25.6    | -          | 3.0          | -            | 18.6                 | 4.0      | 27.8              | 28.6               | 57.1              | 60.4        | 58.9        | 1.5   | -     |
| Montmorency                   | 293.6                        | 43.5                | 23.0      | 18.6     | 1.9        | 28.6    | 7.5        | 1.6          | -            | 16.7                 | 2.8      | 47.7              | 8.7                | 88.9              | 72.3        | 66.3        | 2.0   | 3.9   |
| Newaygo                       | 330.4                        | 53.4                | 13.6      | 29.4     | 10.4       | 1.3     | -          | -            | -            | 6.3                  | -        | 1.3               | 127.6              | 43.2              | 85.8        | 19.1        | 19.1  | -     |
| Oceana                        | 182.0                        | 25.2                | 6.3       | 18.9     | -          | 6.3     | -          | -            | -            | 6.3                  | -        | 56.6              | 22.9               | 50.9              | 19.3        | 19.3        | -     | 0.8   |
| Ogemaw                        | 228.5                        | 50.5                | 31.0      | 16.6     | 2.9        | 17.1    | 1.7        | -            | -            | 15.4                 | -        | 27.7              | 12.9               | 52.0              | 68.3        | 58.3        | 10.0  | -     |
| Oscoda                        | 185.6                        | 17.8                | 6.1       | 11.7     | -          | 12.2    | -          | -            | -            | 12.2                 | -        | 8.0               | 12.3               | 82.9              | 50.2        | 49.0        | 1.2   | -     |
| Oshtemo                       | 307.9                        | 104.4               | 62.7      | 27.8     | 13.9       | 13.3    | 2.7        | -            | 1.6          | 6.6                  | 2.4      | 67.6              | 3.2                | 47.7              | 69.6        | 66.5        | 3.1   | 2.2   |
| Otsego                        | 239.6                        | 39.5                | 13.8      | 19.8     | 5.9        | 20.1    | 4.0        | 1.9          | 1.8          | 12.4                 | -        | 13.5              | 2.0                | 130.6             | 31.8        | 25.9        | 3.9   | 2.0   |
| Presque Isle                  | 298.8                        | 33.6                | 15.7      | 15.9     | 2.0        | 79.0    | 8.1        | 2.0          | 2.3          | 64.2                 | 2.4      | 25.5              | 21.3               | 48.9              | 89.3        | 61.2        | 15.1  | 13.0  |
| Roscommon                     | 254.8                        | 32.5                | 18.2      | 12.2     | 2.1        | 40.2    | 9.2        | -            | -            | 31.0                 | -        | 83.6              | 15.2               | 30.1              | 53.2        | 51.4        | 1.8   | -     |
| Washtenaw                     | 259.3                        | 67.2                | 17.1      | 47.6     | 2.5        | 16.0    | -          | 1.2          | 3.6          | 10.0                 | 1.2      | 15.4              | 13.8               | 96.5              | 50.4        | 46.0        | 4.4   | -     |
| Total                         | 7,216.9                      | 1,208.3             | 520.6     | 591.8    | 95.9       | 569.7   | 62.6       | 25.0         | 24.7         | 419.2                | 38.2     | 1,168.8           | 545.9              | 2,130.3           | 1,577.0     | 1,415.8     | 106.8 | 54.4  |

(Table 3 continued on next page)

| Forest Survey Unit and county | Forest type group/local type |       |           |          |            |            |            |              |              |                      |          |             |                    | Non-stocked |                   |       |       |             |               |
|-------------------------------|------------------------------|-------|-----------|----------|------------|------------|------------|--------------|--------------|----------------------|----------|-------------|--------------------|-------------|-------------------|-------|-------|-------------|---------------|
|                               | White-red-jack pine          |       |           |          |            | Spruce-fir |            |              | Aspen-birch  |                      |          |             |                    |             |                   |       |       |             |               |
|                               | All types                    | Total | Jack pine | Red pine | White pine | Total      | Balsam fir | White spruce | Black spruce | Northern white-cedar | Tamarack | Oak-hickory | Elm-ash-cottonwood |             | Maple-beech-birch | Total | Aspen | Paper birch | Balsam poplar |
| Southern Lower Peninsula      |                              |       |           |          |            |            |            |              |              |                      |          |             |                    |             |                   |       |       |             |               |
| Allegan                       | 178.4                        | 7.7   | 4.6       | 0.6      | 2.5        | -          | -          | -            | -            | -                    | -        | 71.3        | 27.8               | 67.6        | 4.0               | 4.0   | -     | -           | -             |
| Barry                         | 111.2                        | 2.2   | 2.2       | -        | -          | 1.1        | -          | 1.1          | -            | -                    | -        | 44.7        | 13.0               | 50.2        | -                 | -     | -     | -           | -             |
| Berrien                       | 67.0                         | 4.0   | 4.0       | -        | -          | -          | -          | -            | -            | -                    | -        | 16.8        | 15.0               | 31.2        | -                 | -     | -     | -           | -             |
| Branch                        | 54.4                         | -     | -         | -        | -          | -          | -          | -            | -            | -                    | -        | 8.8         | 24.3               | 21.3        | -                 | -     | -     | -           | -             |
| Calhoun                       | 110.6                        | -     | -         | -        | -          | -          | -          | -            | -            | -                    | -        | 18.9        | 17.3               | 72.3        | 2.1               | 2.1   | -     | -           | -             |
| Cass                          | 76.9                         | 0.2   | 0.2       | -        | -          | -          | -          | -            | -            | -                    | -        | 17.6        | 14.8               | 44.3        | -                 | -     | -     | -           | -             |
| Clinton                       | 53.8                         | -     | -         | -        | -          | -          | -          | -            | -            | -                    | -        | 13.1        | 21.3               | 19.4        | -                 | -     | -     | -           | -             |
| Eaton                         | 82.1                         | -     | -         | -        | -          | -          | -          | -            | -            | -                    | -        | 3.7         | 48.2               | 32.2        | -                 | -     | -     | -           | -             |
| Genesee                       | 64.9                         | 1.6   | 1.6       | -        | -          | -          | -          | -            | -            | -                    | -        | 15.2        | 18.9               | 27.5        | 1.7               | -     | 1.7   | -           | -             |
| Griott                        | 2.1                          | 2.1   | -         | -        | 2.1        | -          | -          | -            | -            | -                    | -        | 19.2        | 1.5                | 28.4        | -                 | -     | -     | -           | -             |
| Hillsdale                     | 74.1                         | 8.9   | 4.2       | -        | 4.7        | 0.7        | -          | -            | -            | 0.7                  | -        | 11.8        | 16.7               | 35.0        | -                 | -     | -     | -           | -             |
| Huron                         | 64.5                         | -     | -         | -        | -          | -          | -          | -            | -            | -                    | -        | 2.9         | 25.1               | 25.1        | 11.4              | 8.5   | -     | 2.9         | -             |
| Ingham                        | 62.0                         | -     | -         | -        | -          | -          | -          | -            | -            | -                    | -        | 3.6         | 11.0               | 47.4        | -                 | -     | -     | -           | -             |
| Ionia                         | 74.6                         | -     | -         | -        | -          | -          | -          | 3.8          | -            | -                    | -        | 11.6        | 3.9                | 34.6        | 20.7              | 20.7  | -     | -           | -             |
| Jackson                       | 82.3                         | 2.7   | 2.7       | -        | -          | -          | -          | -            | -            | -                    | -        | 36.4        | 10.9               | 32.3        | -                 | -     | -     | -           | -             |
| Kalamazoo                     | 75.0                         | 12.8  | 7.1       | 5.7      | -          | -          | -          | -            | -            | -                    | -        | 16.0        | 13.8               | 29.2        | 3.2               | 3.2   | -     | -           | -             |
| Kent                          | 155.5                        | 15.6  | 2.4       | 13.2     | -          | -          | -          | -            | -            | -                    | -        | 45.2        | 29.4               | 56.3        | 9.0               | 9.0   | -     | -           | -             |
| Lapeer                        | 109.4                        | 6.7   | -         | 6.7      | -          | 6.7        | -          | 3.7          | -            | 3.0                  | -        | 21.3        | 33.3               | 38.4        | 3.0               | 3.0   | -     | -           | -             |
| Lenawee                       | 55.2                         | -     | -         | -        | -          | -          | -          | -            | -            | -                    | -        | 11.3        | 13.0               | 28.7        | 2.2               | 2.2   | -     | -           | -             |
| Livingston                    | 94.1                         | 2.6   | -         | 2.6      | -          | -          | -          | -            | -            | -                    | -        | 39.9        | 22.7               | 28.9        | -                 | -     | -     | -           | -             |
| Macomb                        | 60.6                         | -     | -         | -        | -          | -          | -          | -            | -            | -                    | -        | 12.9        | 25.6               | 22.1        | -                 | -     | -     | -           | -             |
| Monroe                        | 37.9                         | -     | -         | -        | -          | -          | -          | -            | -            | -                    | -        | 10.5        | 3.4                | 24.0        | -                 | -     | -     | -           | -             |
| Montcalm                      | 133.0                        | 7.0   | -         | 4.3      | 2.7        | 4.1        | -          | -            | -            | 4.1                  | -        | 29.9        | 39.1               | 42.9        | 10.0              | 10.0  | -     | -           | -             |
| Muskegon                      | 159.9                        | 19.6  | 7.1       | 11.6     | 0.9        | -          | -          | -            | -            | -                    | -        | 71.2        | 15.5               | 40.5        | 6.5               | 6.5   | -     | -           | 6.6           |
| Oakland                       | 111.2                        | -     | -         | -        | -          | -          | -          | -            | -            | -                    | -        | 24.6        | 23.6               | 60.4        | 2.6               | 2.6   | -     | -           | -             |
| Ottawa                        | 79.1                         | 9.6   | 4.9       | 4.7      | -          | -          | -          | -            | -            | -                    | -        | 15.2        | 18.1               | 32.8        | 3.4               | 3.4   | -     | -           | -             |
| Saginaw                       | 98.9                         | 6.4   | 1.1       | -        | 5.3        | -          | -          | -            | -            | -                    | -        | 28.1        | 22.2               | 38.5        | 3.7               | 3.7   | -     | -           | -             |
| St. Clair                     | 78.3                         | -     | -         | -        | -          | -          | -          | -            | -            | -                    | -        | 14.4        | 11.0               | 48.3        | 4.6               | 4.6   | -     | -           | -             |
| St. Joseph                    | 65.6                         | 2.8   | -         | -        | 2.8        | -          | -          | -            | -            | -                    | -        | 25.0        | 14.5               | 21.0        | 2.3               | 2.3   | -     | -           | -             |
| Sanilac                       | 79.9                         | 2.6   | -         |          |            |            |            |              |              |                      |          |             |                    |             |                   |       |       |             |               |

Table 4. -- Area of timberland by Forest Survey Unit, county,  
and stand-size class, Michigan, 1993

(In thousand acres)

| Forest Survey<br>Unit and county | All<br>stands | Stand-size class |            |                      |            |
|----------------------------------|---------------|------------------|------------|----------------------|------------|
|                                  |               | Sawtimber        | Poletimber | Sapling-<br>seedling | Nonstocked |
| Eastern Upper Peninsula          |               |                  |            |                      |            |
| Alger                            | 471.4         | 260.6            | 116.4      | 92.3                 | 2.1        |
| Chippewa                         | 707.7         | 288.5            | 184.3      | 234.9                | -          |
| Delta                            | 595.5         | 197.6            | 204.0      | 193.9                | -          |
| Luce                             | 463.4         | 265.8            | 101.1      | 93.8                 | 2.7        |
| Mackinac                         | 522.2         | 189.6            | 186.6      | 143.6                | 2.4        |
| Menominee                        | 523.3         | 120.3            | 201.5      | 200.4                | 1.1        |
| Schoolcraft                      | 525.4         | 231.0            | 136.1      | 158.3                | -          |
| Total                            | 3,808.9       | 1,553.4          | 1,130.0    | 1,117.2              | 8.3        |
| Western Upper Peninsula          |               |                  |            |                      |            |
| Baraga                           | 486.7         | 310.5            | 80.6       | 95.6                 | -          |
| Dickinson                        | 398.2         | 151.2            | 155.4      | 91.6                 | -          |
| Gogebic                          | 608.4         | 299.1            | 223.2      | 84.4                 | 1.7        |
| Houghton                         | 528.9         | 292.7            | 154.7      | 81.5                 | -          |
| Iron                             | 658.0         | 291.0            | 180.8      | 186.2                | -          |
| Keweenaw                         | 198.5         | 124.6            | 43.2       | 30.7                 | -          |
| Marquette                        | 1,005.1       | 458.6            | 264.6      | 276.9                | 5.0        |
| Ontonagon                        | 705.6         | 346.9            | 191.0      | 167.7                | -          |
| Total                            | 4,589.4       | 2,274.6          | 1,293.5    | 1,014.6              | 6.7        |
| Northern Lower Peninsula         |               |                  |            |                      |            |
| Alcona                           | 321.9         | 173.5            | 113.3      | 34.7                 | 0.4        |
| Alpena                           | 233.0         | 77.5             | 91.7       | 62.1                 | 1.7        |
| Antrim                           | 189.7         | 74.9             | 79.8       | 35.0                 | -          |
| Arenac                           | 121.1         | 39.9             | 29.9       | 51.3                 | -          |
| Bay                              | 43.3          | 12.6             | 11.1       | 19.6                 | -          |
| Benzie                           | 136.9         | 67.4             | 38.5       | 31.0                 | -          |
| Charlevoix                       | 170.4         | 106.7            | 57.5       | 6.2                  | -          |
| Cheboygan                        | 339.6         | 128.1            | 109.7      | 101.8                | -          |
| Clare                            | 245.5         | 116.7            | 64.1       | 64.7                 | -          |
| Crawford                         | 290.0         | 102.6            | 113.7      | 73.7                 | -          |
| Emmet                            | 197.6         | 83.7             | 83.9       | 30.0                 | -          |
| Gladwin                          | 186.9         | 66.7             | 60.7       | 59.5                 | -          |
| Grand Traverse                   | 170.9         | 81.8             | 68.7       | 20.4                 | -          |
| Iosco                            | 242.6         | 110.4            | 85.6       | 46.6                 | -          |
| Isabella                         | 101.6         | 48.5             | 26.4       | 26.7                 | -          |
| Kalkaska                         | 267.4         | 99.7             | 106.2      | 59.0                 | 2.5        |
| Lake                             | 315.2         | 151.1            | 95.5       | 68.6                 | -          |
| Leelanau                         | 88.4          | 56.3             | 22.3       | 9.8                  | -          |
| Manistee                         | 249.1         | 100.6            | 89.8       | 58.7                 | -          |
| Mason                            | 157.0         | 88.9             | 42.9       | 25.2                 | -          |
| Mecosta                          | 163.4         | 59.9             | 51.7       | 51.8                 | -          |
| Midland                          | 175.6         | 82.2             | 39.7       | 53.7                 | -          |
| Missaukee                        | 229.3         | 86.4             | 75.5       | 67.4                 | -          |
| Montmorency                      | 293.6         | 107.2            | 85.9       | 96.6                 | 3.9        |
| Newaygo                          | 330.4         | 202.3            | 93.2       | 34.9                 | -          |
| Oceana                           | 182.0         | 91.3             | 40.9       | 49.0                 | 0.8        |
| Ogemaw                           | 228.5         | 73.1             | 95.7       | 59.7                 | -          |
| Osceola                          | 185.6         | 65.0             | 57.6       | 60.8                 | 2.2        |
| Oscoda                           | 307.9         | 105.3            | 79.7       | 120.8                | 2.1        |
| Otsego                           | 239.6         | 86.8             | 109.1      | 41.6                 | 2.1        |
| Presque Isle                     | 298.8         | 98.9             | 122.6      | 76.1                 | 1.2        |
| Roscommon                        | 254.8         | 120.1            | 72.3       | 62.4                 | -          |
| Wexford                          | 259.3         | 86.7             | 139.5      | 33.1                 | -          |
| Total                            | 7,216.9       | 3,052.8          | 2,454.7    | 1,692.5              | 16.9       |

(Table 4 continued on next page)

(Table 4 continued)

| Forest Survey<br>Unit and county | All<br>stands | Stand-size class |            |                      |            |
|----------------------------------|---------------|------------------|------------|----------------------|------------|
|                                  |               | Sawtimber        | Poletimber | Sapling-<br>seedling | Nonstocked |
| Southern Lower Peninsula         |               |                  |            |                      |            |
| Allegan                          | 178.4         | 111.7            | 35.4       | 31.3                 | -          |
| Barry                            | 111.2         | 67.3             | 15.4       | 28.5                 | -          |
| Berrien                          | 67.0          | 61.2             | 4.0        | 1.8                  | -          |
| Branch                           | 54.4          | 30.4             | 11.5       | 12.5                 | -          |
| Calhoun                          | 110.6         | 67.8             | 30.8       | 12.0                 | -          |
| Cass                             | 76.9          | 50.7             | 22.2       | 4.0                  | -          |
| Clinton                          | 53.8          | 22.8             | 10.4       | 20.6                 | -          |
| Eaton                            | 82.1          | 48.5             | 33.6       | -                    | -          |
| Genesee                          | 64.9          | 27.2             | 8.1        | 29.6                 | -          |
| Gratiot                          | 49.2          | 29.3             | 5.5        | 14.4                 | -          |
| Hillsdale                        | 74.1          | 39.3             | 21.8       | 13.0                 | -          |
| Huron                            | 64.5          | 37.4             | 15.3       | 11.8                 | -          |
| Ingham                           | 62.0          | 43.1             | 7.9        | 11.0                 | -          |
| Ionia                            | 74.6          | 38.4             | 36.2       | -                    | -          |
| Jackson                          | 82.3          | 66.0             | 8.0        | 8.3                  | -          |
| Kalamazoo                        | 75.0          | 42.7             | 18.3       | 14.0                 | -          |
| Kent                             | 155.5         | 83.7             | 34.7       | 37.1                 | -          |
| Lapeer                           | 109.4         | 51.6             | 21.9       | 35.9                 | -          |
| Lenawee                          | 55.2          | 33.2             | 13.3       | 8.7                  | -          |
| Livingston                       | 94.1          | 84.3             | 4.6        | 5.2                  | -          |
| Macomb                           | 60.6          | 19.1             | 19.1       | 22.4                 | -          |
| Monroe                           | 37.9          | 27.2             | 9.7        | 1.0                  | -          |
| Montcalm                         | 133.0         | 83.2             | 32.3       | 17.5                 | -          |
| Muskegon                         | 159.9         | 86.0             | 39.6       | 27.7                 | 6.6        |
| Oakland                          | 111.2         | 52.8             | 27.3       | 31.1                 | -          |
| Ottawa                           | 79.1          | 50.7             | 19.0       | 9.4                  | -          |
| Saginaw                          | 98.9          | 31.8             | 38.1       | 29.0                 | -          |
| St. Clair                        | 78.3          | 46.4             | 15.2       | 16.7                 | -          |
| St. Joseph                       | 65.6          | 48.2             | 9.2        | 8.2                  | -          |
| Sanilac                          | 79.9          | 19.1             | 19.9       | 40.9                 | -          |
| Shiawassee                       | 50.2          | 36.2             | 5.4        | 8.6                  | -          |
| Tuscola                          | 115.5         | 34.0             | 36.4       | 45.1                 | -          |
| Van Buren                        | 122.3         | 73.9             | 18.4       | 30.0                 | -          |
| Washtenaw                        | 82.2          | 60.0             | 6.7        | 15.5                 | -          |
| Wayne                            | 30.9          | 18.9             | 7.9        | 4.1                  | -          |
| Total                            | 3,000.7       | 1,724.1          | 663.1      | 606.9                | 6.6        |
| All counties                     | 18,615.9      | 8,604.9          | 5,541.3    | 4,431.2              | 38.5       |

Table 5. -- Area of timberland by Forest Survey Unit, county,  
and potential productivity class, Michigan, 1993

(In thousand acres)

| Forest Survey<br>Unit and county | All<br>classes | Potential productivity class (cubic feet of growth per acre per year) |         |         |         |         |
|----------------------------------|----------------|-----------------------------------------------------------------------|---------|---------|---------|---------|
|                                  |                | 165+                                                                  | 120-164 | 85-119  | 50-84   | 20- 49  |
| Eastern Upper Peninsula          |                |                                                                       |         |         |         |         |
| Alger                            | 471.4          | -                                                                     | 13.5    | 72.5    | 208.0   | 177.4   |
| Chippewa                         | 707.7          | -                                                                     | 12.1    | 95.9    | 225.9   | 373.8   |
| Delta                            | 595.5          | -                                                                     | 19.4    | 96.4    | 237.9   | 241.8   |
| Luce                             | 463.4          | -                                                                     | 3.9     | 38.8    | 161.0   | 259.7   |
| Mackinac                         | 522.2          | 1.8                                                                   | 13.1    | 81.6    | 203.7   | 222.0   |
| Menominee                        | 523.3          | 2.4                                                                   | 31.0    | 86.9    | 196.5   | 206.5   |
| Schoolcraft                      | 525.4          | -                                                                     | 15.9    | 44.2    | 199.6   | 265.7   |
| Total                            | 3,808.9        | 4.2                                                                   | 108.9   | 516.3   | 1,432.6 | 1,746.9 |
| Western Upper Peninsula          |                |                                                                       |         |         |         |         |
| Baraga                           | 486.7          | 1.2                                                                   | 8.8     | 65.9    | 215.6   | 195.2   |
| Dickinson                        | 398.2          | 2.2                                                                   | 17.8    | 95.0    | 180.2   | 103.0   |
| Gogebic                          | 608.4          | 1.2                                                                   | 43.8    | 103.6   | 262.4   | 197.4   |
| Houghton                         | 528.9          | -                                                                     | 23.3    | 105.4   | 295.3   | 104.9   |
| Iron                             | 658.0          | 1.1                                                                   | 38.3    | 130.8   | 330.7   | 157.1   |
| Keweenaw                         | 198.5          | -                                                                     | 1.2     | 12.9    | 53.4    | 131.0   |
| Marquette                        | 1,005.1        | 1.3                                                                   | 29.9    | 122.7   | 402.9   | 448.3   |
| Ontonagon                        | 705.6          | 1.8                                                                   | 23.7    | 159.1   | 367.9   | 153.1   |
| Total                            | 4,589.4        | 8.8                                                                   | 186.8   | 795.4   | 2,108.4 | 1,490.0 |
| Northern Lower Peninsula         |                |                                                                       |         |         |         |         |
| Alcona                           | 321.9          | 4.3                                                                   | 26.3    | 92.6    | 137.2   | 61.5    |
| Alpena                           | 233.0          | 2.3                                                                   | 10.0    | 63.9    | 70.4    | 86.4    |
| Antrim                           | 189.7          | 2.1                                                                   | 4.2     | 56.6    | 80.1    | 46.7    |
| Arenac                           | 121.1          | 1.8                                                                   | 5.0     | 44.1    | 48.7    | 21.5    |
| Bay                              | 43.3           | 2.7                                                                   | -       | 20.8    | 14.2    | 5.6     |
| Benzie                           | 136.9          | 3.3                                                                   | 15.1    | 23.8    | 51.8    | 42.9    |
| Charlevoix                       | 170.4          | -                                                                     | 3.9     | 49.8    | 77.4    | 39.3    |
| Cheboygan                        | 339.6          | -                                                                     | 9.1     | 78.5    | 144.4   | 107.6   |
| Clare                            | 245.5          | 2.1                                                                   | 16.4    | 81.2    | 86.9    | 58.9    |
| Crawford                         | 290.0          | -                                                                     | 4.3     | 29.7    | 106.9   | 149.1   |
| Emmet                            | 197.6          | 2.3                                                                   | 5.0     | 49.4    | 97.8    | 43.1    |
| Gladwin                          | 186.9          | 1.8                                                                   | 17.2    | 58.7    | 91.5    | 17.7    |
| Grand Traverse                   | 170.9          | -                                                                     | 2.7     | 30.1    | 69.3    | 68.8    |
| Iosco                            | 242.6          | -                                                                     | 4.7     | 57.0    | 77.9    | 103.0   |
| Isabella                         | 101.6          | -                                                                     | 17.0    | 44.5    | 29.9    | 10.2    |
| Kalkaska                         | 267.4          | -                                                                     | 7.9     | 70.0    | 99.6    | 89.9    |
| Lake                             | 315.2          | -                                                                     | 25.2    | 75.4    | 114.7   | 99.9    |
| Leelanau                         | 88.4           | 1.1                                                                   | 9.6     | 12.4    | 36.5    | 28.8    |
| Manistee                         | 249.1          | -                                                                     | 6.9     | 59.8    | 119.5   | 62.9    |
| Mason                            | 157.0          | -                                                                     | 14.3    | 35.9    | 72.2    | 34.6    |
| Mecosta                          | 163.4          | 1.9                                                                   | 11.9    | 56.4    | 72.9    | 20.3    |
| Midland                          | 175.6          | -                                                                     | 4.1     | 49.5    | 93.4    | 28.6    |
| Missaukee                        | 229.3          | -                                                                     | 22.5    | 68.3    | 77.3    | 61.2    |
| Montmorency                      | 293.6          | -                                                                     | 5.2     | 55.6    | 154.2   | 78.6    |
| Newaygo                          | 330.4          | 0.9                                                                   | 18.2    | 82.0    | 162.8   | 66.5    |
| Oceana                           | 182.0          | -                                                                     | 12.7    | 40.5    | 88.7    | 40.1    |
| Ogemaw                           | 228.5          | 1.8                                                                   | 8.4     | 59.4    | 76.0    | 82.9    |
| Osceola                          | 185.6          | -                                                                     | 19.3    | 68.5    | 75.2    | 22.6    |
| Oscoda                           | 307.9          | -                                                                     | 11.1    | 50.9    | 130.7   | 115.2   |
| Otsego                           | 239.6          | 4.4                                                                   | 4.1     | 60.0    | 125.1   | 46.0    |
| Presque Isle                     | 298.8          | -                                                                     | 2.2     | 29.2    | 107.7   | 159.7   |
| Roscommon                        | 254.8          | 1.7                                                                   | 3.5     | 53.8    | 107.9   | 87.9    |
| Wexford                          | 259.3          | 0.5                                                                   | 11.8    | 82.6    | 99.3    | 65.1    |
| Total                            | 7,216.9        | 35.0                                                                  | 339.8   | 1,790.9 | 2,998.1 | 2,053.1 |

(Table 5 continued on next page)

(Table 5 continued)

| Forest Survey<br>Unit and county | Potential productivity class (cubic feet of growth per acre per year) |       |         |         |         |         |
|----------------------------------|-----------------------------------------------------------------------|-------|---------|---------|---------|---------|
|                                  | All<br>classes                                                        | 165+  | 120-164 | 85-119  | 50-84   | 20-49   |
| Southern Lower Peninsula         |                                                                       |       |         |         |         |         |
| Allegan                          | 178.4                                                                 | 7.9   | 5.9     | 59.2    | 86.1    | 19.3    |
| Barry                            | 111.2                                                                 | 7.8   | 8.3     | 50.7    | 34.1    | 10.3    |
| Berrien                          | 67.0                                                                  | 6.9   | 6.7     | 38.4    | 15.0    | -       |
| Branch                           | 54.4                                                                  | -     | 6.1     | 29.3    | 19.0    | -       |
| Calhoun                          | 110.6                                                                 | 3.8   | 7.5     | 60.7    | 38.6    | -       |
| Cass                             | 76.9                                                                  | 4.3   | 9.1     | 37.7    | 20.8    | 5.0     |
| Clinton                          | 53.8                                                                  | -     | -       | 25.7    | 17.1    | 11.0    |
| Eaton                            | 82.1                                                                  | 3.6   | 11.0    | 42.7    | 24.8    | -       |
| Genesee                          | 64.9                                                                  | -     | 3.7     | 37.7    | 18.5    | 5.0     |
| Gratiot                          | 49.2                                                                  | -     | -       | 29.4    | 15.9    | 3.9     |
| Hillsdale                        | 74.1                                                                  | -     | 12.9    | 31.4    | 24.4    | 5.4     |
| Huron                            | 64.5                                                                  | -     | 8.6     | 17.3    | 27.0    | 11.6    |
| Ingham                           | 62.0                                                                  | 3.6   | 7.2     | 40.2    | 9.3     | 1.7     |
| Ionia                            | 74.6                                                                  | 3.8   | 15.5    | 19.1    | 36.2    | -       |
| Jackson                          | 82.3                                                                  | 5.4   | 8.0     | 35.2    | 23.9    | 9.8     |
| Kalamazoo                        | 75.0                                                                  | 5.9   | 9.6     | 25.9    | 23.8    | 9.8     |
| Kent                             | 155.5                                                                 | 5.1   | 14.0    | 53.1    | 61.8    | 21.5    |
| Lapeer                           | 109.4                                                                 | -     | 9.7     | 47.7    | 37.7    | 14.3    |
| Lenawee                          | 55.2                                                                  | 4.4   | 2.2     | 24.6    | 24.0    | -       |
| Livingston                       | 94.1                                                                  | -     | -       | 54.8    | 36.3    | 3.0     |
| Macomb                           | 60.6                                                                  | -     | 3.9     | 22.9    | 30.0    | 3.8     |
| Monroe                           | 37.9                                                                  | -     | -       | 32.5    | 3.9     | 1.5     |
| Montcalm                         | 133.0                                                                 | -     | 9.4     | 48.1    | 49.7    | 25.8    |
| Muskegon                         | 159.9                                                                 | -     | 3.4     | 42.1    | 70.7    | 43.7    |
| Oakland                          | 111.2                                                                 | -     | 5.6     | 39.9    | 43.4    | 22.3    |
| Ottawa                           | 79.1                                                                  | -     | 8.0     | 19.5    | 42.4    | 9.2     |
| Saginaw                          | 98.9                                                                  | -     | -       | 23.8    | 71.8    | 3.3     |
| St. Clair                        | 78.3                                                                  | -     | 4.8     | 47.8    | 25.7    | -       |
| St. Joseph                       | 65.6                                                                  | 9.2   | 4.7     | 27.9    | 17.4    | 6.4     |
| Sanilac                          | 79.9                                                                  | -     | -       | 40.4    | 39.5    | -       |
| Shiawassee                       | 50.2                                                                  | -     | 2.8     | 33.7    | 13.7    | -       |
| Tuscola                          | 115.5                                                                 | 2.6   | -       | 43.1    | 63.7    | 6.1     |
| Van Buren                        | 122.3                                                                 | -     | 11.2    | 44.8    | 61.7    | 4.6     |
| Washtenaw                        | 82.2                                                                  | -     | -       | 38.2    | 39.6    | 4.4     |
| Wayne                            | 30.9                                                                  | -     | 2.3     | 19.6    | 3.5     | 5.5     |
| Total                            | 3,000.7                                                               | 74.3  | 202.1   | 1,285.1 | 1,171.0 | 268.2   |
| All counties                     | 18,615.9                                                              | 122.3 | 837.6   | 4,387.7 | 7,710.1 | 5,558.2 |

Table 6. -- Area of timberland by Forest Survey Unit, county,  
and stocking class of growing-stock trees<sup>1</sup>, Michigan, 1993

(In thousand acres)

| Forest Survey<br>Unit and county | All<br>classes | Stocking class of growing-stock trees |                   |                       |                  |                  |
|----------------------------------|----------------|---------------------------------------|-------------------|-----------------------|------------------|------------------|
|                                  |                | Nonstocked <sup>2</sup>               | Poorly<br>stocked | Moderately<br>stocked | Fully<br>stocked | Over-<br>stocked |
|                                  |                |                                       |                   |                       |                  |                  |
| Eastern Upper Peninsula          |                |                                       |                   |                       |                  |                  |
| Alger                            | 471.4          | 3.3                                   | 4.1               | 61.9                  | 220.4            | 181.7            |
| Chippewa                         | 707.7          | -                                     | 27.0              | 120.4                 | 270.1            | 290.2            |
| Delta                            | 595.5          | -                                     | 27.3              | 102.7                 | 216.8            | 248.7            |
| Luce                             | 463.4          | 2.7                                   | 23.1              | 123.2                 | 226.6            | 87.8             |
| Mackinac                         | 522.2          | 3.5                                   | 16.5              | 69.6                  | 203.3            | 229.3            |
| Menominee                        | 523.3          | 3.8                                   | 14.0              | 91.3                  | 234.2            | 180.0            |
| Schoolcraft                      | 525.4          | 1.2                                   | 23.7              | 93.8                  | 206.7            | 200.0            |
| Total                            | 3,808.9        | 14.5                                  | 135.7             | 662.9                 | 1,578.1          | 1,417.7          |
| Western Upper Peninsula          |                |                                       |                   |                       |                  |                  |
| Baraga                           | 486.7          | -                                     | 12.6              | 50.3                  | 215.4            | 208.4            |
| Dickinson                        | 398.2          | -                                     | 11.7              | 78.9                  | 192.5            | 115.1            |
| Gogebic                          | 608.4          | 1.7                                   | 17.1              | 163.1                 | 272.5            | 154.0            |
| Houghton                         | 528.9          | 12.1                                  | 29.8              | 112.1                 | 231.1            | 143.8            |
| Iron                             | 658.0          | 1.8                                   | 25.9              | 104.2                 | 311.5            | 214.6            |
| Keweenaw                         | 198.5          | -                                     | 5.4               | 29.8                  | 94.0             | 69.3             |
| Marquette                        | 1,005.1        | 6.4                                   | 30.5              | 104.0                 | 408.9            | 455.3            |
| Ontonagon                        | 705.6          | -                                     | 18.4              | 98.0                  | 250.6            | 338.6            |
| Total                            | 4,589.4        | 22.0                                  | 151.4             | 740.4                 | 1,976.5          | 1,699.1          |
| Northern Lower Peninsula         |                |                                       |                   |                       |                  |                  |
| Alcona                           | 321.9          | 0.4                                   | 13.1              | 72.2                  | 164.3            | 71.9             |
| Alpena                           | 233.0          | 4.0                                   | 7.3               | 46.1                  | 121.4            | 54.2             |
| Antrim                           | 189.7          | -                                     | 13.9              | 33.8                  | 91.1             | 50.9             |
| Arenac                           | 121.1          | -                                     | 6.7               | 39.0                  | 51.0             | 24.4             |
| Bay                              | 43.3           | -                                     | -                 | 15.2                  | 18.2             | 9.9              |
| Benzie                           | 136.9          | -                                     | 22.2              | 24.4                  | 46.9             | 43.4             |
| Charlevoix                       | 170.4          | 2.1                                   | 8.3               | 10.2                  | 80.9             | 68.9             |
| Cheboygan                        | 339.6          | 6.0                                   | 19.5              | 92.0                  | 158.8            | 63.3             |
| Clare                            | 245.5          | -                                     | 20.4              | 61.0                  | 128.0            | 36.1             |
| Crawford                         | 290.0          | 4.0                                   | 15.0              | 102.9                 | 122.1            | 46.0             |
| Emmet                            | 197.6          | 2.0                                   | 3.4               | 33.6                  | 98.0             | 60.6             |
| Gladwin                          | 186.9          | -                                     | 21.0              | 60.0                  | 92.1             | 13.8             |
| Grand Traverse                   | 170.9          | 1.4                                   | 12.4              | 40.7                  | 76.8             | 39.6             |
| Iosco                            | 242.6          | 2.5                                   | 24.8              | 54.9                  | 105.6            | 54.8             |
| Isabella                         | 101.6          | -                                     | 9.6               | 29.3                  | 44.4             | 18.3             |
| Kalkaska                         | 267.4          | 3.6                                   | 32.6              | 57.6                  | 116.9            | 56.7             |
| Lake                             | 315.2          | -                                     | 7.6               | 58.7                  | 170.7            | 78.2             |
| Leelanau                         | 88.4           | -                                     | 6.0               | 9.9                   | 41.9             | 30.6             |
| Manistee                         | 249.1          | 3.4                                   | 23.4              | 47.1                  | 109.1            | 66.1             |
| Mason                            | 157.0          | -                                     | 13.4              | 30.4                  | 68.5             | 44.7             |
| Mecosta                          | 163.4          | 0.5                                   | 14.5              | 41.6                  | 83.6             | 23.2             |
| Midland                          | 175.6          | -                                     | 7.3               | 32.3                  | 113.4            | 22.6             |
| Missaukee                        | 229.3          | -                                     | 6.2               | 57.8                  | 109.6            | 55.7             |
| Montmorency                      | 293.6          | 3.9                                   | 24.2              | 75.1                  | 128.2            | 62.2             |
| Newaygo                          | 330.4          | -                                     | 17.2              | 62.4                  | 158.3            | 92.5             |
| Oceana                           | 182.0          | 2.3                                   | 23.5              | 30.1                  | 88.1             | 38.0             |
| Ogemaw                           | 228.5          | -                                     | 27.5              | 48.4                  | 102.0            | 50.6             |
| Osceola                          | 185.6          | 7.1                                   | 29.1              | 29.9                  | 80.6             | 38.9             |
| Oscoda                           | 307.9          | 2.1                                   | 25.9              | 70.8                  | 164.6            | 44.5             |
| Otsego                           | 239.6          | 2.1                                   | 12.0              | 60.2                  | 108.3            | 57.0             |
| Presque Isle                     | 298.8          | 1.2                                   | 14.2              | 56.2                  | 154.4            | 72.8             |
| Roscommon                        | 254.8          | -                                     | 5.3               | 41.3                  | 138.8            | 69.4             |
| Wexford                          | 259.3          | 2.9                                   | 10.4              | 53.8                  | 126.4            | 65.8             |
| Total                            | 7,216.9        | 51.5                                  | 497.9             | 1,578.9               | 3,463.0          | 1,625.6          |

(Table 6 continued on next page)

(Table 6 continued)

| Forest Survey<br>Unit and county | All<br>classes | Stocking class of growing-stock trees |                   |                       |                  |                  |
|----------------------------------|----------------|---------------------------------------|-------------------|-----------------------|------------------|------------------|
|                                  |                | Nonstocked <sup>2</sup>               | Poorly<br>stocked | Moderately<br>stocked | Fully<br>stocked | Over-<br>stocked |
| Southern Lower Peninsula         |                |                                       |                   |                       |                  |                  |
| Allegan                          | 178.4          | -                                     | 18.6              | 33.0                  | 87.2             | 39.6             |
| Barry                            | 111.2          | -                                     | 9.8               | 27.8                  | 52.2             | 21.4             |
| Berrien                          | 67.0           | -                                     | -                 | 14.1                  | 32.5             | 20.4             |
| Branch                           | 54.4           | -                                     | 1.9               | 16.1                  | 30.3             | 6.1              |
| Calhoun                          | 110.6          | -                                     | 10.8              | 32.0                  | 52.7             | 15.1             |
| Cass                             | 76.9           | -                                     | 4.3               | 28.7                  | 31.0             | 12.9             |
| Clinton                          | 53.8           | -                                     | 11.8              | 24.0                  | 18.0             | -                |
| Eaton                            | 82.1           | -                                     | 35.3              | 13.7                  | 22.0             | 11.1             |
| Genesee                          | 64.9           | -                                     | 18.0              | 19.6                  | 14.9             | 12.4             |
| Gratiot                          | 49.2           | -                                     | 6.5               | 14.8                  | 27.9             | -                |
| Hillsdale                        | 74.1           | 4.4                                   | 12.1              | 24.5                  | 24.6             | 8.5              |
| Huron                            | 64.5           | -                                     | 11.5              | 16.3                  | 28.2             | 8.5              |
| Ingham                           | 62.0           | -                                     | 6.8               | 22.7                  | 32.5             | -                |
| Ionia                            | 74.6           | -                                     | 4.0               | 15.2                  | 51.5             | 3.9              |
| Jackson                          | 82.3           | -                                     | 10.7              | 28.7                  | 34.8             | 8.1              |
| Kalamazoo                        | 75.0           | 1.3                                   | 3.1               | 11.8                  | 41.3             | 17.5             |
| Kent                             | 155.5          | 1.1                                   | 17.2              | 48.4                  | 63.7             | 25.1             |
| Lapeer                           | 109.4          | -                                     | 21.9              | 62.5                  | 15.1             | 9.9              |
| Lenawee                          | 55.2           | 4.4                                   | 2.2               | 8.8                   | 32.8             | 7.0              |
| Livingston                       | 94.1           | -                                     | 14.0              | 25.2                  | 40.9             | 14.0             |
| Macomb                           | 60.6           | 25.7                                  | 1.4               | 11.3                  | 15.9             | 6.3              |
| Monroe                           | 37.9           | -                                     | 1.5               | 12.5                  | 16.4             | 7.5              |
| Montcalm                         | 133.0          | -                                     | 13.1              | 46.6                  | 49.4             | 23.9             |
| Muskegon                         | 159.9          | 6.6                                   | 5.6               | 22.2                  | 97.5             | 28.0             |
| Oakland                          | 111.2          | 2.6                                   | 21.4              | 42.9                  | 35.6             | 8.7              |
| Ottawa                           | 79.1           | 7.7                                   | 7.0               | 23.4                  | 32.6             | 8.4              |
| Saginaw                          | 98.9           | -                                     | 5.2               | 26.7                  | 52.2             | 14.8             |
| St. Clair                        | 78.3           | -                                     | 1.9               | 19.8                  | 39.4             | 17.2             |
| St. Joseph                       | 65.6           | 2.7                                   | 5.4               | 23.6                  | 21.5             | 12.4             |
| Sanilac                          | 79.9           | -                                     | 24.4              | 33.5                  | 16.2             | 5.8              |
| Shiawassee                       | 50.2           | 3.0                                   | -                 | 11.0                  | 21.7             | 14.5             |
| Tuscola                          | 115.5          | -                                     | 24.0              | 29.2                  | 53.7             | 8.6              |
| Van Buren                        | 122.3          | 2.5                                   | 15.6              | 34.0                  | 50.4             | 19.8             |
| Washtenaw                        | 82.2           | 5.2                                   | 12.3              | 24.1                  | 30.1             | 10.5             |
| Wayne                            | 30.9           | -                                     | 4.1               | 10.3                  | 11.8             | 4.7              |
| Total                            | 3,000.7        | 67.2                                  | 363.4             | 859.0                 | 1,278.5          | 432.6            |
| All counties                     | 18,615.9       | 155.2                                 | 1,148.4           | 3,841.2               | 8,296.1          | 5,175.0          |

<sup>1</sup> This table is based on the stocking percent of growing-stock trees, rather than that of all live trees. For this table, to use the definition of stocking found in the Appendix, replace the term "all live" by "growing-stock."

<sup>2</sup> Area of nonstocked in this table and in Table 8 differs from that in other tables in this report because this table includes land stocked only with growing-stock trees, rather than with all live trees.

Table 7. -- Area of timberland by forest type group/local type and ownership class, Michigan, 1993

(In thousand acres)

| Forest type group/<br>local type | All<br>ownerships | Ownership class |                    |                  |                         |                  |        | Private |                    |            |           |
|----------------------------------|-------------------|-----------------|--------------------|------------------|-------------------------|------------------|--------|---------|--------------------|------------|-----------|
|                                  |                   | Public          |                    |                  | County and<br>municipal | Total<br>private | Indian | Forest  |                    |            | Corporate |
|                                  |                   | Total<br>public | National<br>forest | Other<br>federal |                         |                  |        | State   | Forest<br>industry | Individual |           |
| White-red-jack pine              |                   |                 |                    |                  |                         |                  |        |         |                    |            |           |
| Jack pine                        | 846.1             | 575.0           | 208.3              | 15.3             | 333.3                   | 18.1             | -      | 7.4     | 210.2              | 53.5       |           |
| Red pine                         | 897.2             | 585.8           | 322.8              | 3.7              | 239.6                   | 19.7             | -      | 22.4    | 233.4              | 55.6       |           |
| White pine                       | 233.8             | 105.7           | 41.8               | 1.3              | 62.6                    | -                | -      | 4.7     | 87.8               | 35.6       |           |
| Total                            | 1,977.1           | 1,266.5         | 572.9              | 20.3             | 635.5                   | 37.8             | -      | 34.5    | 531.4              | 144.7      |           |
| Spruce-fir                       |                   |                 |                    |                  |                         |                  |        |         |                    |            |           |
| Balsam fir                       | 563.1             | 215.5           | 91.3               | 5.2              | 112.5                   | 6.5              | -      | 91.2    | 180.1              | 76.3       |           |
| White spruce                     | 146.9             | 65.0            | 39.5               | -                | 25.5                    | -                | -      | 9.9     | 51.6               | 20.4       |           |
| Black spruce                     | 465.1             | 236.0           | 89.6               | -                | 143.0                   | 3.4              | -      | 66.6    | 118.8              | 43.7       |           |
| Northern white-cedar             | 1,349.4           | 524.5           | 145.0              | -                | 362.9                   | 16.6             | 1.6    | 195.8   | 504.3              | 123.2      |           |
| Tamarack                         | 148.9             | 65.8            | 19.5               | -                | 41.1                    | 5.2              | -      | 13.3    | 51.6               | 18.2       |           |
| Total                            | 2,673.4           | 1,106.8         | 384.9              | 5.2              | 685.0                   | 31.7             | 1.6    | 376.8   | 906.4              | 281.8      |           |
| Oak-hickory                      |                   |                 |                    |                  |                         |                  |        |         |                    |            |           |
| Oak-hickory                      | 1,981.8           | 726.2           | 271.5              | -                | 422.0                   | 32.7             | -      | 9.8     | 1,077.1            | 168.7      |           |
| Total                            | 1,981.8           | 726.2           | 271.5              | -                | 422.0                   | 32.7             | -      | 9.8     | 1,077.1            | 168.7      |           |
| Elm-ash-cottonwood               |                   |                 |                    |                  |                         |                  |        |         |                    |            |           |
| Elm-ash-soft maple               | 1,626.9           | 356.3           | 108.5              | -                | 226.4                   | 21.4             | 1.8    | 54.9    | 1,037.7            | 176.2      |           |
| Total                            | 1,626.9           | 356.3           | 108.5              | -                | 226.4                   | 21.4             | 1.8    | 54.9    | 1,037.7            | 176.2      |           |
| Maple-beech-birch                |                   |                 |                    |                  |                         |                  |        |         |                    |            |           |
| Maple-beech-birch                | 7,161.3           | 1,925.3         | 835.3              | 12.0             | 969.3                   | 108.7            | 9.0    | 868.4   | 3,424.3            | 934.3      |           |
| Total                            | 7,161.3           | 1,925.3         | 835.3              | 12.0             | 969.3                   | 108.7            | 9.0    | 868.4   | 3,424.3            | 934.3      |           |
| Aspen-birch                      |                   |                 |                    |                  |                         |                  |        |         |                    |            |           |
| Aspen                            | 2,675.7           | 1,034.7         | 329.2              | 11.1             | 671.2                   | 23.2             | 1.3    | 127.2   | 1,221.3            | 291.2      |           |
| Paper birch                      | 291.5             | 95.2            | 19.2               | 1.0              | 75.0                    | -                | 0.9    | 24.8    | 120.8              | 49.8       |           |
| Balsam poplar                    | 189.7             | 48.8            | 20.9               | -                | 27.9                    | -                | -      | 17.9    | 110.8              | 12.2       |           |
| Total                            | 3,156.9           | 1,178.7         | 369.3              | 12.1             | 774.1                   | 23.2             | 2.2    | 169.9   | 1,452.9            | 353.2      |           |
| Nonstocked                       | 38.5              | 16.7            | -                  | -                | 15.9                    | 0.8              | -      | -       | 18.7               | 3.1        |           |
| All Types                        | 18,615.9          | 6,576.5         | 2,542.4            | 49.6             | 3,728.2                 | 256.3            | 14.6   | 1,514.3 | 8,448.5            | 2,062.0    |           |

Table 8. -- Area of timberland by ownership class and stocking class of growing-stock trees<sup>1</sup>,  
Michigan, 1993

(In thousand acres)

| Ownership class      | All<br>classes | Stocking class of growing-stock trees |                   |                       |                  |                  |
|----------------------|----------------|---------------------------------------|-------------------|-----------------------|------------------|------------------|
|                      |                | Nonstocked <sup>2</sup>               | Poorly<br>stocked | Moderately<br>stocked | Fully<br>stocked | Over-<br>stocked |
| Public               |                |                                       |                   |                       |                  |                  |
| National forest      | 2,542.4        | 2.9                                   | 87.9              | 420.6                 | 970.0            | 1,061.0          |
| Other federal        | 49.6           | -                                     | 2.4               | 10.1                  | 25.8             | 11.3             |
| State                | 3,728.2        | 28.0                                  | 210.8             | 791.3                 | 1,644.2          | 1,053.9          |
| County and municipal | 256.3          | 0.8                                   | 13.2              | 62.1                  | 112.7            | 67.5             |
| Total                | 6,576.5        | 31.7                                  | 314.3             | 1,284.1               | 2,752.7          | 2,193.7          |
| Private              |                |                                       |                   |                       |                  |                  |
| Indian               | 14.6           | -                                     | -                 | 1.8                   | 1.3              | 11.5             |
| Forest industry      | 1,514.3        | -                                     | 33.7              | 252.4                 | 723.3            | 504.9            |
| Corporate            | 8,448.5        | 85.6                                  | 669.5             | 1,916.8               | 3,907.2          | 1,869.4          |
| Individual           | 2,062.0        | 37.9                                  | 130.9             | 386.1                 | 911.6            | 595.5            |
| Total                | 12,039.4       | 123.5                                 | 834.1             | 2,557.1               | 5,543.4          | 2,981.3          |
| All ownerships       | 18,615.9       | 155.2                                 | 1,148.4           | 3,841.2               | 8,296.1          | 5,175.0          |

<sup>1</sup> This table is based on the stocking percent of growing-stock trees, rather than that of all live trees. For this table, to use the definition of stocking found in the Appendix, replace the term "all live" by "growing-stock."

<sup>2</sup> Area of nonstocked in this table and in Table 6 differs from that in other tables in this report because this table includes land stocked only with growing-stock trees, rather than with all live trees.

Table 9. -- Area of timberland by forest type group/local type and stand-size class,  
Michigan, 1993

(In thousand acres)

| Forest type group/<br>local type | All<br>stands | Stand-size class |            |                      |            |
|----------------------------------|---------------|------------------|------------|----------------------|------------|
|                                  |               | Sawtimber        | Poletimber | Sapling-<br>seedling | Nonstocked |
| White-red-jack pine              |               |                  |            |                      |            |
| Jack pine                        | 846.1         | 258.0            | 349.6      | 238.5                | -          |
| Red pine                         | 897.2         | 430.7            | 344.0      | 122.5                | -          |
| White pine                       | 233.8         | 173.8            | 30.5       | 29.5                 | -          |
| Total                            | 1,977.1       | 862.5            | 724.1      | 390.5                | -          |
| Spruce-fir                       |               |                  |            |                      |            |
| Balsam fir                       | 563.1         | 177.3            | 158.2      | 227.6                | -          |
| White spruce                     | 146.9         | 47.1             | 48.9       | 50.9                 | -          |
| Black spruce                     | 465.1         | 49.5             | 141.1      | 274.5                | -          |
| Northern white-cedar             | 1,349.4       | 594.8            | 582.2      | 172.4                | -          |
| Tamarack                         | 148.9         | 31.5             | 40.2       | 77.2                 | -          |
| Total                            | 2,673.4       | 900.2            | 970.6      | 802.6                | -          |
| Oak-hickory                      |               |                  |            |                      |            |
| Oak-hickory                      | 1,981.8       | 1,230.0          | 457.1      | 294.7                | -          |
| Total                            | 1,981.8       | 1,230.0          | 457.1      | 294.7                | -          |
| Elm-ash-cottonwood               |               |                  |            |                      |            |
| Elm-ash-soft maple               | 1,626.9       | 756.5            | 469.8      | 400.6                | -          |
| Total                            | 1,626.9       | 756.5            | 469.8      | 400.6                | -          |
| Maple-beech-birch                |               |                  |            |                      |            |
| Maple-beech-birch                | 7,161.3       | 3,848.4          | 1,979.2    | 1,333.7              | -          |
| Total                            | 7,161.3       | 3,848.4          | 1,979.2    | 1,333.7              | -          |
| Aspen-birch                      |               |                  |            |                      |            |
| Aspen                            | 2,675.7       | 850.7            | 720.6      | 1,104.4              | -          |
| Paper birch                      | 291.5         | 90.4             | 166.8      | 34.3                 | -          |
| Balsam poplar                    | 189.7         | 66.2             | 53.1       | 70.4                 | -          |
| Total                            | 3,156.9       | 1,007.3          | 940.5      | 1,209.1              | -          |
| Nonstocked                       | 38.5          | -                | -          | -                    | 38.5       |
| All types                        | 18,615.9      | 8,604.9          | 5,541.3    | 4,431.2              | 38.5       |

Table 10. -- Number of all live trees on timberland by species group and diameter class, Michigan, 1993  
(In thousand trees)

| Species group         | All classes | Diameter class (inches at breast height) |           |           |         |          |           |           |           |           |           |           | 29.0+ |
|-----------------------|-------------|------------------------------------------|-----------|-----------|---------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-------|
|                       |             | 1.0-2.9                                  | 3.0-4.9   | 5.0-6.9   | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-28.9 |       |
| Softwoods             |             |                                          |           |           |         |          |           |           |           |           |           |           |       |
| Jack pine             | 288,542     | 104,086                                  | 65,381    | 54,568    | 37,888  | 17,579   | 6,768     | 1,642     | 497       | 116       | 12        | 5         | -     |
| Red pine              | 348,613     | 43,930                                   | 70,267    | 98,771    | 77,758  | 32,564   | 13,815    | 6,017     | 2,717     | 1,513     | 742       | 528       | 1     |
| White pine            | 188,278     | 83,758                                   | 39,930    | 24,366    | 12,617  | 9,427    | 6,119     | 3,806     | 2,607     | 1,965     | 1,320     | 2,138     | 225   |
| White spruce          | 145,074     | 57,722                                   | 36,508    | 19,160    | 13,375  | 7,836    | 5,160     | 2,726     | 1,401     | 767       | 254       | 160       | 5     |
| Black spruce          | 331,309     | 146,517                                  | 103,059   | 55,028    | 19,625  | 5,138    | 1,432     | 304       | 112       | 73        | 17        | 4         | -     |
| Balsam fir            | 1,100,257   | 654,086                                  | 270,746   | 105,912   | 44,905  | 18,066   | 4,640     | 1,472     | 319       | 87        | 13        | 11        | -     |
| Hemlock               | 111,348     | 31,035                                   | 21,252    | 15,539    | 10,320  | 9,856    | 7,677     | 5,748     | 4,402     | 2,474     | 1,366     | 1,593     | 86    |
| Tamarack              | 110,457     | 47,842                                   | 30,674    | 17,872    | 8,203   | 3,508    | 1,500     | 522       | 226       | 77        | 21        | 8         | 4     |
| Eastern redcedar      | 2,917       | 1,728                                    | 483       | 465       | 144     | 70       | 19        | 6         | -         | -         | -         | 2         | -     |
| Northern white-cedar  | 1,015,683   | 327,251                                  | 282,615   | 204,787   | 110,738 | 51,529   | 22,126    | 9,963     | 3,829     | 1,730     | 666       | 438       | 11    |
| Other softwoods       | 60,929      | 14,258                                   | 19,442    | 14,080    | 8,387   | 3,522    | 966       | 174       | 87        | -         | 13        | -         | -     |
| Total softwoods       | 3,703,407   | 1,512,213                                | 940,357   | 610,548   | 343,960 | 159,095  | 70,222    | 32,370    | 16,197    | 8,802     | 4,424     | 4,887     | 332   |
| Hardwoods             |             |                                          |           |           |         |          |           |           |           |           |           |           |       |
| Select white oak      | 172,982     | 65,379                                   | 33,501    | 25,175    | 15,481  | 12,271   | 7,227     | 5,278     | 3,331     | 2,184     | 1,212     | 1,634     | 309   |
| Other white oak       | 458         | 261                                      | 45        | 29        | 33      | 90       | -         | -         | -         | -         | -         | -         | -     |
| Select red oak        | 260,453     | 105,490                                  | 33,085    | 30,307    | 23,981  | 22,511   | 17,409    | 11,719    | 6,434     | 3,935     | 2,543     | 2,794     | 245   |
| Other red oak         | 79,867      | 30,280                                   | 11,984    | 11,730    | 7,588   | 6,279    | 4,415     | 2,805     | 2,180     | 1,199     | 713       | 609       | 85    |
| Select hickory        | 19,956      | 9,676                                    | 2,946     | 1,926     | 1,382   | 1,493    | 1,069     | 760       | 379       | 171       | 85        | 68        | 1     |
| Other hickory         | 18,187      | 8,713                                    | 3,394     | 2,090     | 1,277   | 1,005    | 856       | 438       | 201       | 134       | 53        | 26        | -     |
| Basswood              | 147,903     | 45,971                                   | 22,043    | 19,615    | 20,573  | 16,392   | 11,953    | 5,863     | 2,958     | 1,361     | 603       | 547       | 24    |
| Beech                 | 137,560     | 74,176                                   | 21,910    | 13,818    | 8,185   | 6,050    | 3,986     | 3,134     | 2,553     | 1,587     | 891       | 1,191     | 79    |
| Yellow birch          | 58,027      | 20,266                                   | 37,954    | 24,251    | 14,220  | 9,734    | 5,939     | 3,868     | 2,766     | 1,566     | 800       | 1,050     | 91    |
| Hard maple            | 1,526,564   | 720,643                                  | 315,478   | 219,318   | 118,321 | 70,387   | 37,916    | 19,505    | 11,602    | 6,626     | 3,262     | 3,249     | 257   |
| Soft maple            | 1,427,221   | 678,184                                  | 313,495   | 185,195   | 110,295 | 66,030   | 34,961    | 18,116    | 10,000    | 5,302     | 2,528     | 2,763     | 352   |
| Elm                   | 260,689     | 145,211                                  | 66,421    | 24,813    | 12,253  | 6,640    | 2,908     | 1,281     | 659       | 281       | 89        | 131       | 2     |
| Black ash             | 365,994     | 203,899                                  | 94,423    | 39,829    | 16,554  | 6,258    | 2,790     | 1,432     | 497       | 199       | 63        | 50        | -     |
| White & green ash     | 327,105     | 176,841                                  | 63,024    | 34,505    | 21,959  | 12,484   | 7,738     | 4,693     | 2,928     | 1,570     | 649       | 648       | 66    |
| Sycamore              | 999         | 288                                      | -         | 156       | 24      | 149      | 116       | 61        | 20        | 64        | 12        | 86        | 23    |
| Cottonwood            | 11,766      | 2,617                                    | 1,997     | 1,991     | 1,201   | 848      | 803       | 691       | 609       | 382       | 191       | 328       | 108   |
| Willow                | 9,161       | 3,462                                    | 1,535     | 1,282     | 761     | 540      | 468       | 283       | 347       | 141       | 113       | 177       | 52    |
| Hackberry             | 2,809       | 1,018                                    | 844       | 535       | 112     | 49       | 12        | 11        | 9         | 19        | -         | -         | -     |
| Balsam poplar         | 113,501     | 59,582                                   | 19,869    | 12,252    | 7,382   | 6,212    | 3,347     | 2,185     | 1,310     | 656       | 339       | 357       | 10    |
| Bigtooth aspen        | 394,892     | 204,333                                  | 73,095    | 37,018    | 26,615  | 22,431   | 16,087    | 9,227     | 3,690     | 1,460     | 577       | 353       | 6     |
| Quaking aspen         | 1,062,811   | 625,602                                  | 193,935   | 94,609    | 55,930  | 40,869   | 26,260    | 13,510    | 7,083     | 3,245     | 1,028     | 734       | 6     |
| Paper birch           | 263,755     | 77,349                                   | 59,989    | 54,850    | 35,471  | 21,157   | 9,386     | 3,547     | 1,286     | 462       | 139       | 113       | 6     |
| Tupelo                | 3,920       | 1,557                                    | 826       | 962       | 293     | 159      | 29        | 69        | -         | -         | -         | 25        | -     |
| Black cherry          | 297,353     | 187,473                                  | 41,336    | 26,918    | 18,025  | 11,441   | 5,881     | 3,405     | 1,494     | 819       | 286       | 266       | 9     |
| Black walnut          | 8,375       | 2,274                                    | 1,263     | 1,615     | 1,049   | 901      | 526       | 348       | 161       | 122       | 55        | 53        | 8     |
| Butternut             | 2,507       | 639                                      | 1,059     | 161       | 240     | 115      | 158       | 69        | 29        | 19        | 6         | 12        | -     |
| Yellow-poplar         | 3,188       | 903                                      | 501       | 499       | 167     | 259      | 267       | 158       | 165       | 60        | 116       | 87        | 6     |
| Sassafras             | 70,096      | 42,742                                   | 14,411    | 6,811     | 3,472   | 1,402    | 779       | 334       | 97        | 44        | -         | 4         | -     |
| Other hardwoods       | 59,525      | 42,620                                   | 7,449     | 4,840     | 2,504   | 1,090    | 624       | 195       | 124       | 25        | 42        | 9         | 3     |
| Total hardwoods       | 7,209,663   | 3,575,210                                | 1,437,812 | 877,100   | 525,348 | 345,246  | 203,910   | 112,985   | 62,912    | 33,633    | 16,395    | 17,364    | 1,748 |
| Noncommercial species | 493,902     | 376,571                                  | 83,486    | 23,928    | 6,876   | 2,228    | 580       | 165       | 24        | 4         | 11        | 25        | 4     |
| All species           | 11,406,972  | 5,463,994                                | 2,461,655 | 1,511,576 | 876,184 | 506,569  | 274,712   | 145,520   | 79,133    | 42,439    | 20,830    | 22,276    | 2,084 |

Table 11. -- Number of growing-stock trees on timberland by species group and diameter class, Michigan, 1993  
(in thousand trees)

| Species group        | All classes | Diameter class (inches at breast height) |           |           |         |          |           |           |           |           |           |        |       |  |  | 21.0-28.9 | 29.0+ |
|----------------------|-------------|------------------------------------------|-----------|-----------|---------|----------|-----------|-----------|-----------|-----------|-----------|--------|-------|--|--|-----------|-------|
|                      |             | 1.0-2.9                                  | 3.0-4.9   | 5.0-6.9   | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 |        |       |  |  |           |       |
| Softwoods            |             |                                          |           |           |         |          |           |           |           |           |           |        |       |  |  |           |       |
| Jack pine            | 275,352     | 102,416                                  | 61,926    | 50,769    | 35,786  | 16,229   | 6,230     | 1,507     | 380       | 98        | 7         | 4      | 1     |  |  |           |       |
| Red pine             | 341,718     | 43,345                                   | 68,272    | 97,041    | 76,183  | 31,875   | 13,644    | 5,936     | 2,676     | 1,495     | 730       | 520    | 206   |  |  |           |       |
| White pine           | 181,399     | 83,275                                   | 38,508    | 22,952    | 11,419  | 8,434    | 5,667     | 3,457     | 2,413     | 1,799     | 1,257     | 2,012  | 2     |  |  |           |       |
| White spruce         | 143,357     | 57,515                                   | 36,118    | 18,661    | 13,138  | 7,658    | 5,021     | 2,685     | 1,401     | 752       | 251       | 155    | -     |  |  |           |       |
| Black spruce         | 325,896     | 144,085                                  | 101,469   | 54,245    | 19,172  | 5,015    | 1,407     | 299       | 110       | 73        | 17        | 4      | -     |  |  |           |       |
| Balsam fir           | 1,091,019   | 650,895                                  | 267,790   | 104,220   | 44,181  | 17,687   | 4,469     | 1,366     | 307       | 83        | 10        | 11     | 73    |  |  |           |       |
| Hemlock              | 101,753     | 30,670                                   | 20,186    | 13,803    | 8,821   | 7,903    | 6,489     | 5,020     | 3,841     | 2,271     | 1,240     | 1,436  | -     |  |  |           |       |
| Tamarack             | 106,104     | 46,883                                   | 29,612    | 16,753    | 7,570   | 3,167    | 1,355     | 480       | 191       | 70        | 19        | 4      | -     |  |  |           |       |
| Eastern redcedar     | 2,687       | 1,530                                    | 483       | 465       | 144     | 48       | 9         | 6         | -         | -         | 425       | 266    | 6     |  |  |           |       |
| Northern white-cedar | 933,138     | 317,490                                  | 264,824   | 183,726   | 96,437  | 41,771   | 16,815    | 7,383     | 2,819     | 1,176     | -         | -      | -     |  |  |           |       |
| Other softwoods      | 54,418      | 13,937                                   | 17,084    | 12,916    | 6,657   | 2,804    | 774       | 155       | 79        | -         | 12        | -      | -     |  |  |           |       |
| Total softwoods      | 3,556,841   | 1,492,041                                | 906,272   | 575,551   | 319,508 | 142,591  | 61,880    | 28,294    | 14,217    | 7,817     | 3,968     | 4,414  | 288   |  |  |           |       |
| Hardwoods            |             |                                          |           |           |         |          |           |           |           |           |           |        |       |  |  |           |       |
| Select white oak     | 164,779     | 64,450                                   | 31,037    | 24,040    | 14,621  | 11,425   | 6,724     | 4,812     | 3,069     | 1,964     | 1,046     | 1,391  | 200   |  |  |           |       |
| Other white oak      | 413         | 261                                      | 45        | 29        | 33      | 45       | -         | -         | -         | -         | -         | -      | -     |  |  |           |       |
| Select red oak       | 249,991     | 105,367                                  | 31,327    | 28,132    | 22,762  | 21,104   | 15,856    | 10,898    | 5,889     | 3,679     | 2,351     | 2,451  | 175   |  |  |           |       |
| Other red oak        | 74,328      | 30,031                                   | 10,535    | 10,458    | 6,812   | 5,745    | 3,928     | 2,496     | 2,017     | 1,095     | 625       | 524    | 62    |  |  |           |       |
| Select hickory       | 19,500      | 9,490                                    | 2,946     | 1,886     | 1,340   | 1,493    | 1,004     | 684       | 365       | 171       | 52        | 68     | 1     |  |  |           |       |
| Other hickory        | 18,034      | 8,713                                    | 3,394     | 2,090     | 1,194   | 998      | 856       | 405       | 201       | 120       | 44        | 19     | -     |  |  |           |       |
| Basswood             | 140,719     | 45,614                                   | 20,481    | 18,161    | 19,462  | 15,442   | 11,169    | 5,410     | 2,727     | 1,241     | 569       | 430    | 13    |  |  |           |       |
| Beech                | 126,251     | 71,519                                   | 20,280    | 12,477    | 6,994   | 4,908    | 3,172     | 2,303     | 1,838     | 1,243     | 634       | 831    | 52    |  |  |           |       |
| Yellow birch         | 136,774     | 54,886                                   | 33,333    | 19,388    | 10,613  | 7,345    | 4,327     | 2,672     | 2,047     | 1,031     | 538       | 568    | 26    |  |  |           |       |
| Hard maple           | 1,446,448   | 698,371                                  | 298,703   | 205,172   | 109,258 | 63,358   | 33,083    | 16,943    | 10,189    | 5,721     | 2,853     | 2,663  | 134   |  |  |           |       |
| Soft maple           | 1,350,757   | 667,354                                  | 292,078   | 169,456   | 100,399 | 58,851   | 29,948    | 15,583    | 8,439     | 4,278     | 2,033     | 2,127  | 211   |  |  |           |       |
| Elm                  | 250,438     | 143,718                                  | 61,936    | 23,178    | 10,973  | 6,176    | 2,488     | 1,036     | 528       | 233       | 85        | 86     | 1     |  |  |           |       |
| Black ash            | 343,723     | 197,899                                  | 86,434    | 35,248    | 14,247  | 5,430    | 2,417     | 1,329     | 449       | 168       | 60        | 42     | 48    |  |  |           |       |
| White & green ash    | 317,394     | 175,779                                  | 59,493    | 32,644    | 20,765  | 11,836   | 7,053     | 4,347     | 2,742     | 1,492     | 588       | 607    | 48    |  |  |           |       |
| Sycamore             | 884         | 288                                      | -         | 49        | 24      | 149      | 116       | 61        | 20        | 64        | 12        | 82     | 19    |  |  |           |       |
| Cottonwood           | 11,024      | 2,479                                    | 1,715     | 1,961     | 1,036   | 826      | 777       | 670       | 582       | 379       | 179       | 318    | 102   |  |  |           |       |
| Willow               | 7,402       | 3,360                                    | 1,319     | 807       | 597     | 398      | 251       | 187       | 212       | 75        | 74        | 99     | 23    |  |  |           |       |
| Hackberry            | 2,609       | 1,018                                    | 844       | 535       | 112     | 49       | 11        | 11        | 9         | 19        | -         | -      | -     |  |  |           |       |
| Balsam poplar        | 108,983     | 58,820                                   | 18,561    | 11,427    | 6,881   | 5,763    | 3,079     | 2,054     | 1,154     | 603       | 305       | 326    | 10    |  |  |           |       |
| Bigtooth aspen       | 382,689     | 203,381                                  | 70,320    | 34,036    | 24,839  | 21,292   | 15,166    | 8,459     | 3,306     | 1,187     | 474       | 227    | 2     |  |  |           |       |
| Quaking aspen        | 1,021,830   | 620,845                                  | 185,244   | 86,072    | 50,487  | 36,549   | 22,315    | 11,188    | 5,573     | 2,390     | 693       | 469    | 5     |  |  |           |       |
| Paper birch          | 243,958     | 75,345                                   | 55,410    | 49,451    | 31,970  | 19,046   | 8,069     | 3,077     | 1,057     | 373       | 106       | 54     | -     |  |  |           |       |
| Tupelo               | 3,556       | 1,503                                    | 826       | 905       | 166     | 65       | 13        | 61        | -         | -         | -         | 17     | -     |  |  |           |       |
| Black cherry         | 265,095     | 182,412                                  | 31,755    | 20,653    | 12,819  | 8,525    | 4,291     | 2,482     | 1,136     | 588       | 214       | 211    | 9     |  |  |           |       |
| Black walnut         | 7,966       | 2,274                                    | 1,197     | 1,560     | 965     | 799      | 511       | 307       | 161       | 111       | 47        | 34     | -     |  |  |           |       |
| Butternut            | 2,262       | 639                                      | 1,059     | 72        | 169     | 91       | 133       | 48        | 29        | 15        | 6         | 1      | -     |  |  |           |       |
| Yellow-poplar        | 3,178       | 903                                      | 501       | 499       | 167     | 259      | 267       | 158       | 165       | 60        | 109       | 87     | 3     |  |  |           |       |
| Sassafras            | 63,862      | 42,457                                   | 11,838    | 5,064     | 2,555   | 1,051    | 536       | 243       | 97        | 17        | -         | 4      | -     |  |  |           |       |
| Other hardwoods      | 53,670      | 41,696                                   | 5,778     | 3,437     | 1,660   | 649      | 296       | 63        | 73        | 9         | -         | 9      | -     |  |  |           |       |
| Total hardwoods      | 6,818,517   | 3,510,872                                | 1,338,389 | 798,887   | 473,920 | 309,667  | 177,857   | 97,987    | 54,074    | 28,326    | 13,697    | 13,745 | 1,096 |  |  |           |       |
| All species          | 10,375,358  | 5,002,913                                | 2,244,661 | 1,374,438 | 793,428 | 452,258  | 239,737   | 126,281   | 68,291    | 36,143    | 17,665    | 18,159 | 1,384 |  |  |           |       |

Table 12. -- Net volume of growing stock on timberland by species group and diameter class, Michigan, 1993

(In thousand cubic feet)

| Species group        | All classes | Diameter class (inches at breast height) |           |           |           |           |           |           |           |           |         | 29.0+  |
|----------------------|-------------|------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---------|--------|
|                      |             | 5.0-6.9                                  | 7.0-8.9   | 9.0-10.9  | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-28.9 |         |        |
| Softwoods            |             |                                          |           |           |           |           |           |           |           |           |         |        |
| Jack pine            | 603,319     | 116,849                                  | 185,862   | 153,521   | 94,975    | 34,556    | 12,454    | 4,419     | 433       | 250       | -       | -      |
| Red pine             | 1,626,692   | 268,878                                  | 443,603   | 321,915   | 219,097   | 139,941   | 88,323    | 64,877    | 40,782    | 39,116    | 160     | 43,306 |
| White pine           | 869,620     | 51,571                                   | 60,211    | 83,214    | 91,785    | 84,721    | 86,031    | 86,905    | 79,371    | 202,505   | 276     | -      |
| White spruce         | 494,221     | 48,900                                   | 81,842    | 84,450    | 90,312    | 71,617    | 51,598    | 36,285    | 15,270    | 13,671    | -       | -      |
| Black spruce         | 365,055     | 152,618                                  | 116,697   | 54,794    | 24,356    | 7,810     | 3,831     | 3,641     | 1,045     | 263       | -       | -      |
| Balsam fir           | 822,551     | 262,681                                  | 255,564   | 182,399   | 73,654    | 32,778    | 10,178    | 3,817     | 561       | 919       | -       | -      |
| Hemlock              | 661,724     | 22,544                                   | 35,780    | 61,856    | 83,387    | 98,592    | 105,872   | 83,634    | 58,078    | 100,984   | 10,997  | -      |
| Tamarack             | 180,922     | 49,652                                   | 48,120    | 35,539    | 23,903    | 12,473    | 6,574     | 3,242     | 1,051     | 368       | -       | -      |
| Eastern redcedar     | 2,931       | 1,169                                    | 849       | 465       | 174       | 126       | -         | -         | -         | 148       | -       | -      |
| Northern white-cedar | 1,832,717   | 422,903                                  | 490,348   | 373,532   | 235,104   | 150,438   | 79,406    | 43,307    | 20,015    | 16,890    | 774     | -      |
| Other softwoods      | 112,318     | 30,236                                   | 35,213    | 27,909    | 11,905    | 3,689     | 2,703     | -         | 663       | -         | -       | -      |
| Total softwoods      | 7,572,070   | 1,428,001                                | 1,754,089 | 1,379,594 | 948,652   | 636,741   | 446,970   | 330,127   | 217,269   | 375,114   | 55,513  | -      |
| Hardwoods            |             |                                          |           |           |           |           |           |           |           |           |         |        |
| Select white oak     | 819,566     | 56,480                                   | 77,453    | 107,013   | 100,476   | 104,513   | 93,039    | 80,440    | 54,838    | 110,875   | 34,439  | -      |
| Other white oak      | 644         | 71                                       | 178       | 395       | -         | -         | -         | -         | -         | -         | -       | -      |
| Select red oak       | 1,604,647   | 65,993                                   | 125,538   | 206,719   | 244,869   | 249,638   | 188,025   | 157,438   | 129,257   | 205,221   | 31,949  | -      |
| Other red oak        | 397,604     | 23,102                                   | 34,271    | 53,090    | 55,665    | 53,004    | 58,729    | 41,633    | 31,245    | 37,947    | 8,918   | -      |
| Select hickory       | 92,659      | 4,573                                    | 7,757     | 15,299    | 16,727    | 17,569    | 13,064    | 8,319     | 3,010     | 6,099     | 242     | -      |
| Other hickory        | 65,120      | 4,480                                    | 6,848     | 10,326    | 15,229    | 10,267    | 7,392     | 6,239     | 2,594     | 1,745     | -       | -      |
| Basswood             | 903,635     | 53,149                                   | 124,197   | 174,075   | 195,764   | 137,405   | 93,861    | 55,087    | 32,312    | 34,517    | 3,268   | -      |
| Beech                | 477,377     | 36,042                                   | 44,891    | 57,584    | 56,416    | 57,569    | 63,019    | 54,240    | 35,037    | 65,476    | 7,103   | -      |
| Yellow birch         | 498,381     | 51,638                                   | 63,962    | 76,916    | 68,621    | 61,186    | 63,584    | 41,261    | 26,962    | 40,917    | 3,334   | -      |
| Hard maple           | 4,042,740   | 573,338                                  | 705,537   | 725,899   | 586,350   | 435,230   | 355,409   | 261,128   | 162,239   | 216,336   | 21,274  | -      |
| Soft maple           | 3,452,234   | 456,263                                  | 627,829   | 651,145   | 518,065   | 387,439   | 287,439   | 190,197   | 114,591   | 176,269   | 42,997  | -      |
| Elm                  | 282,103     | 55,234                                   | 60,334    | 64,297    | 40,217    | 24,231    | 16,754    | 9,750     | 4,422     | 6,720     | 144     | -      |
| Black ash            | 338,088     | 91,895                                   | 84,438    | 58,134    | 41,447    | 32,943    | 14,830    | 7,458     | 3,442     | 3,501     | -       | -      |
| White & green ash    | 814,075     | 82,498                                   | 120,778   | 124,110   | 119,722   | 108,215   | 93,794    | 69,010    | 34,626    | 52,623    | 8,699   | -      |
| Sycamore             | 23,004      | 207                                      | 149       | 1,678     | 2,191     | 1,822     | 712       | 3,428     | 754       | 8,068     | 3,995   | -      |
| Cottonwood           | 131,894     | 3,359                                    | 5,347     | 8,347     | 12,206    | 14,873    | 18,840    | 15,837    | 9,403     | 27,193    | 16,489  | -      |
| Willow               | 43,316      | 1,827                                    | 3,068     | 3,697     | 3,708     | 4,266     | 6,364     | 3,074     | 3,999     | 9,044     | 4,269   | -      |
| Hackberry            | 4,628       | 1,647                                    | 788       | 492       | 177       | 342       | 354       | 828       | -         | -         | -       | -      |
| Balsam poplar        | 345,096     | 30,364                                   | 40,832    | 62,572    | 51,006    | 49,753    | 39,081    | 26,483    | 17,853    | 25,453    | 1,699   | -      |
| Bigtooth aspen       | 1,236,719   | 99,530                                   | 166,227   | 246,442   | 274,687   | 224,219   | 121,325   | 57,008    | 28,776    | 18,221    | 284     | -      |
| Quaking aspen        | 1,971,082   | 226,512                                  | 304,934   | 397,251   | 384,181   | 279,625   | 192,562   | 108,504   | 38,786    | 37,879    | 848     | -      |
| Paper birch          | 844,859     | 144,501                                  | 206,112   | 213,194   | 140,379   | 76,899    | 36,554    | 17,031    | 6,040     | 4,149     | -       | -      |
| Tupelo               | 6,192       | 2,316                                    | 895       | 580       | 209       | 1,236     | -         | -         | -         | 956       | -       | -      |
| Black cherry         | 496,151     | 61,773                                   | 88,249    | 102,316   | 79,467    | 66,551    | 40,602    | 27,480    | 12,636    | 15,948    | 1,129   | -      |
| Black walnut         | 54,445      | 4,363                                    | 6,747     | 9,056     | 9,520     | 8,433     | 5,680     | 4,969     | 2,868     | 2,809     | -       | -      |
| Butternut            | 8,718       | 289                                      | 1,232     | 1,253     | 2,598     | 1,422     | 1,148     | 450       | 237       | 89        | -       | -      |
| Yellow-poplar        | 38,756      | 1,261                                    | 947       | 2,996     | 4,674     | 4,432     | 6,073     | 3,034     | 6,804     | 8,139     | 396     | -      |
| Sassafras            | 48,629      | 9,978                                    | 13,373    | 9,354     | 7,388     | 4,675     | 2,780     | 706       | -         | 375       | -       | -      |
| Other hardwoods      | 30,453      | 7,471                                    | 8,315     | 5,876     | 4,175     | 1,431     | 2,196     | 363       | -         | 626       | -       | -      |
| Total hardwoods      | 19,072,815  | 2,150,154                                | 2,931,226 | 3,390,106 | 3,036,134 | 2,419,188 | 1,823,210 | 1,251,395 | 762,731   | 1,117,195 | 191,476 | -      |
| All species          | 26,644,885  | 3,578,155                                | 4,685,315 | 4,769,700 | 3,984,786 | 3,055,929 | 2,270,180 | 1,581,522 | 980,000   | 1,492,309 | 246,989 | -      |

Table 13. -- Net volume of growing stock in the saw-log portion of sawtimber trees on timberland by species group and diameter class, Michigan, 1993

(In thousand cubic feet)

| Species group        | All classes | Diameter class (inches at breast height) |           |           |           |           |           |           |         | 29.0+  |
|----------------------|-------------|------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|---------|--------|
|                      |             | 9.0-10.9                                 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-28.9 |         |        |
| Softwoods            |             |                                          |           |           |           |           |           |           |         |        |
| Jack pine            | 254,513     | 125,085                                  | 82,882    | 30,775    | 11,180    | 3,975     | 390       | 226       | -       | 147    |
| Red pine             | 831,900     | 282,677                                  | 202,207   | 130,341   | 82,253    | 60,273    | 37,807    | 36,195    | 177,340 | 38,271 |
| White pine           | 649,315     | 64,523                                   | 76,981    | 72,839    | 74,554    | 75,580    | 69,227    | 177,340   | 12,615  | 256    |
| White spruce         | 327,905     | 72,398                                   | 81,858    | 65,763    | 47,510    | 33,433    | 14,072    | 248       | -       | -      |
| Black spruce         | 88,622      | 49,832                                   | 23,061    | 7,424     | 3,636     | 3,437     | 984       | 827       | -       | 9,952  |
| Balsam fir           | 254,138     | 147,393                                  | 63,878    | 29,032    | 9,083     | 3,420     | 505       | 90,575    | 338     | -      |
| Hemlock              | 527,532     | 49,332                                   | 71,381    | 86,427    | 93,666    | 74,367    | 51,832    | 136       | -       | 701    |
| Tamarack             | 73,442      | 30,233                                   | 21,509    | 11,395    | 6,026     | 2,975     | 966       | 15,203    | -       | -      |
| Eastern redcedar     | 780         | 374                                      | 156       | 114       | -         | -         | -         | -         | -       | -      |
| Northern white-cedar | 782,342     | 301,786                                  | 203,707   | 133,260   | 70,919    | 38,798    | 17,968    | -         | -       | -      |
| Other softwoods      | 39,286      | 22,659                                   | 10,334    | 3,280     | 2,418     | -         | 595       | -         | -       | -      |
| Total softwoods      | 3,829,775   | 1,146,292                                | 837,954   | 570,650   | 401,245   | 296,258   | 194,346   | 333,703   | 49,327  | -      |
| Hardwoods            |             |                                          |           |           |           |           |           |           |         |        |
| Select white oak     | 421,671     | -                                        | 64,195    | 74,150    | 68,699    | 60,476    | 41,701    | 85,421    | 27,029  | -      |
| Select red oak       | 877,696     | -                                        | 157,513   | 178,226   | 139,732   | 119,282   | 99,016    | 158,699   | 25,228  | -      |
| Other red oak        | 210,146     | -                                        | 35,705    | 37,904    | 43,931    | 31,836    | 24,085    | 29,630    | 7,055   | -      |
| Select hickory       | 43,357      | -                                        | 9,526     | 11,667    | 9,157     | 5,989     | 2,225     | 4,599     | 194     | -      |
| Other hickory        | 28,544      | -                                        | 8,854     | 6,790     | 5,185     | 4,483     | 1,913     | 1,319     | -       | -      |
| Basswood             | 401,013     | -                                        | 131,074   | 101,088   | 71,427    | 42,581    | 25,124    | 27,098    | 2,621   | -      |
| Beech                | 261,616     | -                                        | 38,330    | 43,199    | 49,338    | 43,287    | 28,272    | 53,325    | 5,865   | -      |
| Yellow birch         | 232,114     | -                                        | 46,075    | 45,953    | 49,570    | 32,819    | 21,664    | 33,274    | 2,759   | -      |
| Hard maple           | 1,465,951   | -                                        | 376,903   | 312,486   | 266,100   | 199,439   | 125,286   | 168,850   | 16,887  | -      |
| Soft maple           | 1,213,127   | -                                        | 326,662   | 273,350   | 212,181   | 143,320   | 87,411    | 136,197   | 34,006  | -      |
| Elm                  | 68,229      | -                                        | 24,171    | 16,492    | 11,975    | 7,124     | 3,285     | 5,070     | 112     | -      |
| Black ash            | 76,056      | -                                        | 28,438    | 24,770    | 11,490    | 5,840     | 2,729     | 2,789     | -       | -      |
| White & green ash    | 357,015     | -                                        | 79,795    | 79,053    | 70,808    | 52,768    | 26,726    | 40,985    | 6,880   | -      |
| Sycamore             | 16,464      | -                                        | 1,495     | 1,378     | 559       | 2,705     | 602       | 6,471     | 3,254   | -      |
| Cottonwood           | 81,606      | -                                        | 7,056     | 9,688     | 13,145    | 11,407    | 6,910     | 20,526    | 12,874  | -      |
| Willow               | 24,706      | -                                        | 2,121     | 2,797     | 4,444     | 2,199     | 2,940     | 6,851     | 3,354   | -      |
| Hackberry            | 1,207       | -                                        | 105       | 239       | 254       | 609       | -         | -         | -       | -      |
| Balsam poplar        | 155,974     | -                                        | 34,459    | 36,580    | 29,688    | 20,365    | 13,775    | 19,774    | 1,333   | -      |
| Bigtooth aspen       | 531,675     | -                                        | 189,022   | 167,572   | 93,371    | 44,469    | 22,621    | 14,394    | 226     | -      |
| Quaking aspen        | 761,753     | -                                        | 261,884   | 207,540   | 147,465   | 84,135    | 30,338    | 29,718    | 673     | -      |
| Paper birch          | 192,264     | -                                        | 90,386    | 54,582    | 26,877    | 12,715    | 4,549     | 3,155     | -       | -      |
| Tupelo               | 1,816       | -                                        | 148       | 891       | -         | -         | -         | 777       | -       | -      |
| Black cherry         | 172,493     | -                                        | 51,060    | 47,530    | 30,155    | 20,822    | 9,660     | 12,369    | 897     | -      |
| Black walnut         | 25,578      | -                                        | 6,472     | 6,316     | 4,398     | 3,903     | 2,248     | 2,241     | -       | -      |
| Butternut            | 4,346       | -                                        | 1,764     | 1,067     | 890       | 361       | 194       | 70        | -       | -      |
| Yellow-poplar        | 25,580      | -                                        | 3,145     | 3,295     | 4,651     | 2,366     | 5,346     | 6,460     | 317     | -      |
| Sassafras            | 11,243      | -                                        | 4,870     | 3,421     | 2,118     | 541       | -         | 293       | -       | -      |
| Other hardwoods      | 6,299       | -                                        | 2,803     | 1,064     | 1,664     | 278       | -         | 490       | -       | -      |
| Total hardwoods      | 7,669,539   | -                                        | 1,984,031 | 1,749,088 | 1,369,272 | 956,119   | 588,620   | 870,845   | 151,564 | -      |
| All species          | 11,499,314  | 1,146,292                                | 2,821,985 | 2,319,738 | 1,770,517 | 1,252,377 | 782,966   | 1,204,548 | 200,891 | -      |

Table 14. -- Net volume of sawtimber on timberland by species group and diameter class, Michigan, 1993

(In thousand board feet)<sup>1</sup>

| Species group        | All classes | Diameter class (inches at breast height) |            |            |            |           |           |           |           | 29.0+   |
|----------------------|-------------|------------------------------------------|------------|------------|------------|-----------|-----------|-----------|-----------|---------|
|                      |             | 9.0-10.9                                 | 11.0-12.9  | 13.0-14.9  | 15.0-16.9  | 17.0-18.9 | 19.0-20.9 | 21.0-28.9 |           |         |
| Softwoods            |             |                                          |            |            |            |           |           |           |           |         |
| Jack pine            | 1,474,600   | 734,438                                  | 468,300    | 177,284    | 66,371     | 24,329    | 2,442     | 1,436     | -         | -       |
| Red pine             | 4,791,938   | 1,619,442                                | 1,125,667  | 740,158    | 481,306    | 362,361   | 232,787   | 229,239   | 978       | 260,314 |
| White pine           | 3,973,439   | 380,321                                  | 432,791    | 416,845    | 439,977    | 459,582   | 431,862   | 1,151,747 | 81,955    | 1,724   |
| White spruce         | 1,950,136   | 427,895                                  | 471,114    | 386,002    | 286,231    | 206,480   | 88,735    | 81,955    | 1,596     | -       |
| Black spruce         | 508,901     | 284,596                                  | 130,297    | 43,168     | 21,757     | 21,247    | 6,240     | 1,596     | -         | -       |
| Balsam fir           | 1,481,028   | 867,587                                  | 362,501    | 167,584    | 53,946     | 20,920    | 3,144     | 5,346     | -         | -       |
| Hemlock              | 3,154,012   | 296,485                                  | 401,993    | 492,117    | 548,237    | 447,829   | 319,990   | 580,126   | 2,195     | 67,235  |
| Tamarack             | 430,682     | 177,311                                  | 123,604    | 66,873     | 36,261     | 18,353    | 6,085     | 2,195     | 887       | -       |
| Eastern redcedar     | 4,877       | 2,372                                    | 932        | 686        | -          | -         | -         | 887       | -         | -       |
| Northern white-cedar | 4,696,896   | 1,855,182                                | 1,187,143  | 780,451    | 423,767    | 236,723   | 111,943   | 96,994    | 4,693     | -       |
| Other softwoods      | 226,052     | 131,164                                  | 57,993     | 18,843     | 14,329     | -         | 3,723     | -         | -         | -       |
| Total softwoods      | 22,692,561  | 6,776,793                                | 4,762,335  | 3,290,011  | 2,372,182  | 1,797,824 | 1,206,951 | 2,151,521 | -         | 334,944 |
| Hardwoods            |             |                                          |            |            |            |           |           |           |           |         |
| Select white oak     | 2,659,883   | -                                        | 404,673    | 452,678    | 421,129    | 376,346   | 263,891   | 556,890   | 184,276   | -       |
| Select red oak       | 5,513,432   | -                                        | 990,813    | 1,086,603  | 857,056    | 743,410   | 627,608   | 1,035,653 | 172,289   | -       |
| Other red oak        | 1,320,026   | -                                        | 227,519    | 232,046    | 269,803    | 198,223   | 152,316   | 192,380   | 47,739    | -       |
| Select hickory       | 271,408     | -                                        | 60,942     | 71,368     | 56,283     | 37,400    | 14,097    | 29,991    | 1,327     | -       |
| Other hickory        | 178,167     | -                                        | 55,992     | 41,575     | 31,879     | 28,011    | 12,107    | 8,603     | -         | -       |
| Basswood             | 2,504,525   | -                                        | 822,723    | 620,314    | 441,036    | 266,482   | 159,644   | 176,250   | 18,076    | -       |
| Beech                | 1,676,951   | -                                        | 247,578    | 271,833    | 310,895    | 275,269   | 181,899   | 349,849   | 39,628    | -       |
| Yellow birch         | 1,473,171   | -                                        | 296,534    | 286,510    | 309,417    | 206,865   | 138,172   | 216,997   | 18,676    | -       |
| Hard maple           | 9,282,920   | -                                        | 2,408,570  | 1,941,376  | 1,658,768  | 1,257,683 | 800,316   | 1,101,775 | 114,432   | -       |
| Soft maple           | 7,708,538   | -                                        | 2,096,255  | 1,701,152  | 1,323,657  | 903,931   | 558,722   | 891,484   | 233,337   | -       |
| Elm                  | 431,468     | -                                        | 155,606    | 102,275    | 74,275     | 44,646    | 20,911    | 33,005    | 750       | -       |
| Black ash            | 475,217     | -                                        | 179,281    | 152,599    | 71,100     | 36,616    | 17,384    | 18,237    | -         | -       |
| White & green ash    | 2,214,657   | -                                        | 491,215    | 477,975    | 432,986    | 328,666   | 169,431   | 267,338   | 47,046    | -       |
| Sycamore             | 107,688     | -                                        | 9,390      | 8,526      | 3,494      | 17,223    | 3,873     | 42,824    | 22,358    | -       |
| Cottonwood           | 520,161     | -                                        | 44,855     | 59,183     | 80,417     | 70,717    | 43,507    | 133,799   | 87,683    | -       |
| Willow               | 157,770     | -                                        | 13,622     | 17,102     | 27,161     | 13,619    | 18,529    | 44,853    | 22,884    | -       |
| Hackberry            | 7,544       | -                                        | 680        | 1,472      | 1,582      | 3,810     | -         | -         | -         | -       |
| Balsam poplar        | 977,493     | -                                        | 216,198    | 224,399    | 183,664    | 127,623   | 87,830    | 128,711   | 9,068     | -       |
| Bigtooth aspen       | 3,293,765   | -                                        | 1,174,224  | 1,024,055  | 576,740    | 279,196   | 144,315   | 93,715    | 1,520     | -       |
| Quaking aspen        | 4,736,558   | -                                        | 1,635,170  | 1,270,987  | 911,209    | 527,802   | 193,049   | 193,754   | 4,587     | -       |
| Paper birch          | 1,209,190   | -                                        | 573,710    | 338,108    | 167,374    | 80,286    | 29,127    | 20,585    | -         | -       |
| Tupelo               | 11,271      | -                                        | 911        | 5,397      | -          | -         | -         | 4,963     | -         | -       |
| Black cherry         | 1,087,087   | -                                        | 326,243    | 295,115    | 187,520    | 130,868   | 61,506    | 79,857    | 5,978     | -       |
| Black walnut         | 160,994     | -                                        | 41,074     | 39,126     | 27,372     | 24,517    | 14,321    | 14,584    | -         | -       |
| Butternut            | 27,239      | -                                        | 11,157     | 6,600      | 5,557      | 2,251     | 1,219     | 455       | -         | -       |
| Yellow-poplar        | 162,735     | -                                        | 19,716     | 20,229     | 28,842     | 14,943    | 34,267    | 42,586    | 2,152     | -       |
| Sassafras            | 69,742      | -                                        | 30,660     | 20,837     | 12,949     | 3,369     | -         | 1,927     | -         | -       |
| Other hardwoods      | 39,053      | -                                        | 17,519     | 6,460      | 10,168     | 1,727     | -         | 3,179     | -         | -       |
| Total hardwoods      | 48,278,653  | -                                        | 12,552,830 | 10,775,900 | 8,482,333  | 6,001,499 | 3,748,041 | 5,684,244 | 1,033,806 | -       |
| All species          | 70,971,214  | 6,776,793                                | 17,315,165 | 14,065,911 | 10,854,515 | 7,799,323 | 4,954,992 | 7,835,765 | 1,368,750 | -       |

<sup>1</sup>International 1/4-inch rule.

Table 15. -- Net volume of sawtimber on timberland by species group, grade, diameter class, and Forest Survey Unit, Michigan, 1993

(In thousand board feet)

| Species group        | Log grade 1                              |              |                |                | Log grade 2                              |                  |                  |                  | Log grade 3                              |                |                  |                  | Log grade 4                              |                |                |                  |
|----------------------|------------------------------------------|--------------|----------------|----------------|------------------------------------------|------------------|------------------|------------------|------------------------------------------|----------------|------------------|------------------|------------------------------------------|----------------|----------------|------------------|
|                      | Diameter class (inches at breast height) |              |                |                | Diameter class (inches at breast height) |                  |                  |                  | Diameter class (inches at breast height) |                |                  |                  | Diameter class (inches at breast height) |                |                |                  |
|                      | Total                                    | 9.0-14.9     | 15.0-18.9      | 19.0-20.9      | 21.0+                                    | Total            | 9.0-14.9         | 15.0-18.9        | 19.0-20.9                                | 21.0+          | Total            | 9.0-14.9         | 15.0-18.9                                | 19.0-20.9      | 21.0+          | Total            |
| <b>Softwoods</b>     |                                          |              |                |                |                                          |                  |                  |                  |                                          |                |                  |                  |                                          |                |                |                  |
| Jack pine            | -                                        | -            | -              | -              | -                                        | 1,640            | 1,582            | 53               | 5                                        | -              | 443,495          | 427,630          | 14,434                                   | 1,431          | -              | -                |
| Red pine             | 13,476                                   | 1,510        | 7,374          | 4,592          | -                                        | 35,835           | 16,156           | 16,577           | 3,102                                    | -              | 1,081,372        | 820,982          | 184,805                                  | 65,638         | 9,967          | -                |
| White pine           | 201,314                                  | 2,154        | 40,898         | 74,513         | 83,749                                   | 260,120          | 71,630           | 76,780           | 42,072                                   | 69,638         | 405,560          | 150,866          | 92,400                                   | 90,214         | 72,080         | 203,755          |
| White spruce         | 1,168                                    | -            | 1,168          | -              | -                                        | 13,683           | 5,804            | 7,879            | -                                        | -              | 601,126          | 421,847          | 129,182                                  | 37,927         | 12,160         | -                |
| Black spruce         | -                                        | -            | -              | -              | -                                        | 1,995            | 1,995            | -                | -                                        | -              | 188,651          | 174,697          | 8,405                                    | 5,549          | -              | -                |
| Balsam fir           | -                                        | -            | -              | -              | -                                        | -                | -                | -                | -                                        | -              | 457,685          | 423,974          | 31,207                                   | 2,504          | -              | -                |
| Hemlock              | 48,238                                   | -            | 20,331         | 18,155         | 9,752                                    | 113,228          | 22,477           | 46,735           | 35,368                                   | 8,648          | 633,790          | 308,809          | 189,107                                  | 69,341         | 86,533         | -                |
| Tamarack             | -                                        | -            | -              | -              | -                                        | 13,906           | 5,892            | 8,014            | -                                        | -              | 101,506          | 99,190           | -                                        | 2,316          | -              | -                |
| Eastern redcedar     | -                                        | -            | -              | -              | -                                        | 28,007           | 18,692           | 9,315            | -                                        | -              | -                | -                | -                                        | -              | -              | -                |
| Northern white-cedar | 7,608                                    | -            | 2,369          | 5,237          | -                                        | -                | -                | -                | -                                        | -              | 1,787,436        | 1,549,709        | 200,331                                  | 30,288         | 7,108          | -                |
| Other softwoods      | -                                        | -            | -              | -              | -                                        | -                | -                | -                | -                                        | -              | 15,212           | 14,682           | 530                                      | -              | -              | -                |
| <b>Total</b>         | <b>271,802</b>                           | <b>3,664</b> | <b>72,140</b>  | <b>102,497</b> | <b>93,501</b>                            | <b>488,414</b>   | <b>144,228</b>   | <b>165,353</b>   | <b>80,547</b>                            | <b>78,286</b>  | <b>5,695,833</b> | <b>4,392,366</b> | <b>810,411</b>                           | <b>305,208</b> | <b>187,948</b> | <b>203,755</b>   |
|                      |                                          |              |                |                |                                          |                  |                  |                  |                                          |                |                  |                  |                                          |                |                |                  |
| <b>Hardwoods</b>     |                                          |              |                |                |                                          |                  |                  |                  |                                          |                |                  |                  |                                          |                |                |                  |
| Select white oak     | -                                        | -            | -              | -              | -                                        | -                | -                | -                | -                                        | -              | 2,354            | 1,043            | 543                                      | 768            | -              | -                |
| Select red oak       | 12,477                                   | -            | -              | 6,227          | 6,250                                    | 37,780           | 8,920            | 16,893           | 11,967                                   | -              | 22,690           | 17,834           | 4,856                                    | -              | -              | 30,378           |
| Other red oak        | -                                        | -            | -              | -              | -                                        | -                | -                | -                | -                                        | -              | -                | -                | -                                        | -              | -              | -                |
| Select hickory       | -                                        | -            | -              | -              | -                                        | -                | -                | -                | -                                        | -              | 1,138            | 341              | -                                        | -              | 797            | -                |
| Other hickory        | -                                        | -            | -              | -              | -                                        | -                | -                | -                | -                                        | -              | 61,873           | 55,636           | -                                        | 4,338          | 1,899          | -                |
| Basswood             | 45,313                                   | 3,795        | 25,821         | 12,453         | 3,244                                    | 67,996           | 39,950           | 28,046           | -                                        | -              | 263,505          | 110,265          | 111,714                                  | 41,526         | -              | 169,108          |
| Beech                | 60,609                                   | -            | 31,097         | 18,535         | 10,977                                   | 243,020          | 97,041           | 91,846           | 37,353                                   | 16,780         | 143,256          | 80,693           | 46,437                                   | 9,618          | 6,508          | 30,392           |
| Yellow birch         | 42,561                                   | -            | 28,063         | 11,238         | 3,259                                    | 125,591          | 38,665           | 50,096           | 27,588                                   | 9,242          | 763,981          | 573,429          | 143,294                                  | 47,258         | -              | 181,132          |
| Hard maple           | 173,008                                  | -            | 76,495         | 74,289         | 22,224                                   | 586,972          | 198,329          | 266,042          | 64,892                                   | 57,709         | 622,820          | 415,094          | 116,114                                  | 78,525         | 12,887         | 204,652          |
| Soft maple           | 85,239                                   | -            | 54,244         | 27,874         | 3,121                                    | 350,576          | 146,652          | 169,229          | 25,414                                   | 9,281          | 13,939           | 8,739            | -                                        | 4,829          | 571            | -                |
| Elm                  | -                                        | -            | -              | -              | -                                        | 6,792            | 6,792            | 5,514            | 1,137                                    | 141            | 32,374           | 30,518           | 1,856                                    | -              | -              | 5,135            |
| Black ash            | 2,294                                    | -            | -              | 2,294          | -                                        | 21,022           | 18,702           | 2,320            | -                                        | -              | 31,607           | 23,493           | 8,114                                    | -              | -              | 3,084            |
| White & green ash    | 43,021                                   | -            | 26,353         | 11,896         | 4,772                                    | 18,290           | 18,290           | -                | -                                        | -              | -                | -                | -                                        | -              | -              | 2,442            |
| Sycamore             | -                                        | -            | -              | -              | -                                        | -                | -                | -                | -                                        | -              | -                | -                | -                                        | -              | -              | 485              |
| Cottonwood           | -                                        | -            | -              | -              | -                                        | -                | -                | -                | -                                        | -              | -                | -                | -                                        | -              | -              | -                |
| Willow               | -                                        | -            | -              | -              | -                                        | -                | -                | -                | -                                        | -              | -                | -                | -                                        | -              | -              | -                |
| Hackberry            | -                                        | -            | -              | -              | -                                        | -                | -                | -                | -                                        | -              | -                | -                | -                                        | -              | -              | -                |
| Balsam poplar        | 29,486                                   | -            | 18,354         | 4,678          | 6,454                                    | 115,006          | 52,875           | 49,368           | 12,763                                   | -              | 156,469          | 114,944          | 26,182                                   | 15,343         | -              | 70,261           |
| Bigtooth aspen       | 26,628                                   | -            | 13,659         | 12,580         | 389                                      | 38,133           | 8,510            | 29,272           | -                                        | 351            | 97,426           | 83,874           | -                                        | 12,543         | 1,009          | 25,487           |
| Quaking aspen        | 80,605                                   | -            | 56,690         | 10,916         | 13,009                                   | 272,405          | 136,747          | 112,986          | 22,672                                   | -              | 417,696          | 326,490          | 73,847                                   | 17,359         | -              | 136,160          |
| Paper birch          | 8,884                                    | -            | 4,346          | 4,498          | 40                                       | 91,907           | 56,047           | 35,448           | -                                        | 412            | 209,839          | 196,930          | 11,969                                   | -              | -              | 44,256           |
| Tupelo               | -                                        | -            | -              | -              | -                                        | -                | -                | -                | -                                        | -              | 60,826           | 47,612           | 10,261                                   | 2,540          | 413            | 6,158            |
| Black cherry         | 2,477                                    | -            | 2,356          | 104            | 17                                       | 54,369           | 36,650           | 15,080           | 2,269                                    | 370            | -                | -                | -                                        | -              | -              | 3,422            |
| Black walnut         | -                                        | -            | -              | -              | -                                        | -                | -                | -                | -                                        | -              | -                | -                | -                                        | -              | -              | -                |
| Butternut            | -                                        | -            | -              | -              | -                                        | 677              | -                | 677              | -                                        | -              | 1,866            | 1,204            | 662                                      | -              | -              | -                |
| Yellow-poplar        | -                                        | -            | -              | -              | -                                        | -                | -                | -                | -                                        | -              | -                | -                | -                                        | -              | -              | -                |
| Sassafras            | -                                        | -            | -              | -              | -                                        | -                | -                | -                | -                                        | -              | -                | -                | -                                        | -              | -              | -                |
| Other hardwoods      | -                                        | -            | -              | -              | -                                        | 145              | 145              | -                | -                                        | -              | 401              | 401              | -                                        | -              | -              | -                |
| <b>Total</b>         | <b>612,602</b>                           | <b>3,795</b> | <b>337,468</b> | <b>197,583</b> | <b>73,756</b>                            | <b>2,030,681</b> | <b>857,523</b>   | <b>872,817</b>   | <b>206,055</b>                           | <b>94,286</b>  | <b>2,903,860</b> | <b>2,068,540</b> | <b>555,849</b>                           | <b>234,447</b> | <b>25,024</b>  | <b>912,510</b>   |
| <b>All species</b>   | <b>884,404</b>                           | <b>7,459</b> | <b>409,608</b> | <b>300,080</b> | <b>167,257</b>                           | <b>2,499,095</b> | <b>1,001,751</b> | <b>1,038,170</b> | <b>286,602</b>                           | <b>172,572</b> | <b>8,599,693</b> | <b>6,480,906</b> | <b>1,366,260</b>                         | <b>539,655</b> | <b>212,872</b> | <b>1,116,265</b> |
|                      |                                          |              |                |                |                                          |                  |                  |                  |                                          |                |                  |                  |                                          |                |                |                  |

(Table 15 continued on next page)

## Western Upper Peninsula

| Species group        | Log grade 1                              |               |                |                | Log grade 2                              |                  |                  |                  | Log grade 3                              |                |                   |                  | Log grade 4                              |                  |                |                |
|----------------------|------------------------------------------|---------------|----------------|----------------|------------------------------------------|------------------|------------------|------------------|------------------------------------------|----------------|-------------------|------------------|------------------------------------------|------------------|----------------|----------------|
|                      | Diameter class (inches at breast height) |               |                |                | Diameter class (inches at breast height) |                  |                  |                  | Diameter class (inches at breast height) |                |                   |                  | Diameter class (inches at breast height) |                  |                |                |
|                      | Total                                    | 9.0-14.9      | 15.0-18.9      | 19.0-20.9      | 21.0+                                    | Total            | 9.0-14.9         | 15.0-18.9        | 19.0-20.9                                | 21.0+          | Total             | 9.0-14.9         | 15.0-18.9                                | 19.0-20.9        | 21.0+          | Total          |
| <b>Softwoods</b>     |                                          |               |                |                |                                          |                  |                  |                  |                                          |                |                   |                  |                                          |                  |                |                |
| Jack pine            | -                                        | -             | -              | -              | -                                        | 6,789            | 6,759            | -                | 30                                       | -              | 335,350           | 283,399          | 50,575                                   | 1,376            | -              | -              |
| Red pine             | 122,273                                  | 40,644        | 61,703         | 19,926         | -                                        | 32,941           | 8,164            | 17,320           | 4,181                                    | 9,276          | 411,443           | 326,579          | 28,377                                   | 35,821           | 20,666         | -              |
| White pine           | 161,695                                  | 4,788         | 43,296         | 37,272         | 76,339                                   | 297,139          | 74,320           | 69,027           | 60,749                                   | 93,043         | 528,244           | 131,231          | 120,617                                  | 149,384          | 127,012        | 81,858         |
| White spruce         | -                                        | -             | -              | -              | -                                        | 25,210           | 6,685            | 2,421            | 1,706                                    | 14,398         | 1,098,882         | 697,207          | 312,818                                  | 86,857           | -              | -              |
| Black spruce         | -                                        | -             | -              | -              | -                                        | -                | -                | -                | -                                        | -              | 253,541           | 223,324          | 27,933                                   | 2,284            | -              | -              |
| Balsam fir           | -                                        | -             | -              | -              | -                                        | -                | -                | -                | -                                        | -              | 772,432           | 793,265          | 33,181                                   | 2,593            | 3,393          | -              |
| Hemlock              | 28,113                                   | -             | 11,743         | 5,113          | 11,257                                   | 170,664          | 20,241           | 62,011           | 64,713                                   | 23,699         | 1,709,947         | 603,190          | 584,457                                  | 328,416          | 213,884        | -              |
| Tamarack             | -                                        | -             | -              | -              | -                                        | 12,715           | 6,085            | 3,253            | 3,266                                    | 111            | 146,139           | 120,626          | 23,300                                   | 1,187            | 1,026          | -              |
| Eastern redcedar     | -                                        | -             | -              | -              | -                                        | -                | -                | -                | -                                        | -              | -                 | -                | -                                        | -                | -              | -              |
| Northern white-cedar | -                                        | -             | -              | -              | -                                        | 32,149           | 20,184           | 11,965           | -                                        | -              | 1,573,703         | 1,109,016        | 320,146                                  | 119,690          | 25,851         | -              |
| Other softwoods      | -                                        | -             | -              | -              | -                                        | -                | -                | -                | -                                        | -              | 3,679             | 3,099            | 580                                      | -                | -              | -              |
| <b>Total</b>         | <b>312,081</b>                           | <b>45,432</b> | <b>116,742</b> | <b>62,311</b>  | <b>87,596</b>                            | <b>577,607</b>   | <b>142,438</b>   | <b>165,997</b>   | <b>134,645</b>                           | <b>134,527</b> | <b>6,831,360</b>  | <b>4,230,936</b> | <b>1,481,984</b>                         | <b>726,608</b>   | <b>391,832</b> | <b>81,858</b>  |
|                      |                                          |               |                |                |                                          |                  |                  |                  |                                          |                |                   |                  |                                          |                  |                |                |
| Species group        | Tree grade 1                             |               |                |                | Tree grade 2                             |                  |                  |                  | Tree grade 3                             |                |                   |                  | Tree grade 4                             |                  |                |                |
|                      | Diameter class (inches at breast height) |               |                |                | Diameter class (inches at breast height) |                  |                  |                  | Diameter class (inches at breast height) |                |                   |                  | Diameter class (inches at breast height) |                  |                |                |
|                      | Total                                    | 11.0-14.9     | 15.0-18.9      | 19.0-20.9      | 21.0+                                    | Total            | 11.0-14.9        | 15.0-18.9        | 19.0-20.9                                | 21.0+          | Total             | 11.0-14.9        | 15.0-18.9                                | 19.0-20.9        | 21.0+          | Total          |
| <b>Hardwoods</b>     |                                          |               |                |                |                                          |                  |                  |                  |                                          |                |                   |                  |                                          |                  |                |                |
| Select white oak     | -                                        | -             | -              | -              | -                                        | -                | -                | -                | -                                        | -              | 2,739             | 2,739            | -                                        | -                | -              | -              |
| Select red oak       | 78,664                                   | -             | 22,052         | 36,138         | 20,474                                   | 113,354          | 38,026           | 55,404           | 17,507                                   | 2,417          | 150,210           | 103,056          | 30,318                                   | 11,290           | 5,546          | 28,862         |
| Other red oak        | -                                        | -             | -              | -              | -                                        | -                | -                | -                | -                                        | -              | -                 | -                | -                                        | -                | -              | -              |
| Select hickory       | -                                        | -             | -              | -              | -                                        | -                | -                | -                | -                                        | -              | -                 | -                | -                                        | -                | -              | -              |
| Other hickory        | -                                        | -             | -              | -              | -                                        | -                | -                | -                | -                                        | -              | -                 | -                | -                                        | -                | -              | -              |
| Basswood             | 141,463                                  | 4,154         | 91,959         | 30,587         | 14,763                                   | 223,562          | 136,230          | 67,072           | 14,270                                   | 5,990          | 394,264           | 342,018          | 35,389                                   | 16,857           | -              | 21,633         |
| Beech                | 204                                      | -             | 204            | -              | -                                        | 322              | 322              | -                | -                                        | -              | 567               | 127              | 440                                      | -                | 31             | 31             |
| Yellow birch         | 167,822                                  | -             | 84,898         | 52,916         | 30,018                                   | 248,273          | 104,283          | 100,635          | 37,156                                   | 6,199          | 529,378           | 248,151          | 138,084                                  | 80,730           | 62,413         | 38,293         |
| Hard maple           | 639,389                                  | -             | 323,565        | 187,167        | 128,667                                  | 1,437,641        | 474,455          | 606,494          | 305,149                                  | 51,743         | 2,264,556         | 1,445,418        | 495,603                                  | 234,419          | 89,116         | 343,750        |
| Soft maple           | 79,902                                   | -             | 48,068         | 16,269         | 15,565                                   | 357,882          | 184,506          | 136,706          | 36,670                                   | -              | 985,290           | 638,580          | 254,750                                  | 79,983           | 11,977         | 137,296        |
| Elm                  | 115,494                                  | 47,458        | 39,975         | 14,396         | 13,665                                   | -                | -                | -                | -                                        | -              | -                 | -                | -                                        | -                | -              | -              |
| Black ash            | 17,344                                   | -             | 15,692         | -              | 1,652                                    | 68,702           | 38,412           | 20,034           | 10,256                                   | -              | 111,163           | 99,266           | 11,897                                   | -                | -              | 3,916          |
| White & green ash    | 32,370                                   | -             | 18,883         | 13,487         | -                                        | 52,604           | 31,826           | 20,778           | -                                        | -              | 39,008            | 39,006           | -                                        | -                | -              | -              |
| Sycamore             | -                                        | -             | -              | -              | -                                        | -                | -                | -                | -                                        | -              | -                 | -                | -                                        | -                | -              | -              |
| Cottonwood           | -                                        | -             | -              | -              | -                                        | -                | -                | -                | -                                        | -              | -                 | -                | -                                        | -                | -              | -              |
| Willow               | 485                                      | -             | -              | -              | -                                        | 787              | 251              | 536              | -                                        | -              | 584               | 128              | 456                                      | -                | -              | -              |
| Hackberry            | -                                        | -             | -              | -              | -                                        | -                | -                | -                | -                                        | -              | -                 | -                | -                                        | -                | -              | -              |
| Balsam poplar        | 49,337                                   | -             | 25,124         | 15,614         | 8,599                                    | 58,125           | 17,513           | 19,995           | 13,700                                   | 6,917          | 67,815            | 44,161           | 15,238                                   | 6,130            | 2,286          | 7,922          |
| Bigtooth aspen       | 77,573                                   | -             | 65,352         | 12,221         | -                                        | 139,382          | 72,629           | 45,659           | 21,094                                   | -              | 202,987           | 148,776          | 35,982                                   | 6,287            | 11,942         | 13,489         |
| Quaking aspen        | 59,463                                   | -             | 47,922         | 10,914         | 627                                      | 317,086          | 146,720          | 141,057          | 25,074                                   | 4,235          | 1,263,772         | 822,724          | 341,543                                  | 81,293           | 18,212         | 178,914        |
| Paper birch          | 16,694                                   | -             | 11,509         | 4,961          | 224                                      | 129,579          | 75,543           | 44,294           | 7,605                                    | 2,137          | 280,138           | 236,260          | 38,974                                   | -                | 4,904          | 23,764         |
| Tupelo               | -                                        | -             | -              | -              | -                                        | -                | -                | -                | -                                        | -              | -                 | -                | -                                        | -                | -              | -              |
| Black cherry         | 3,242                                    | -             | 3,242          | -              | -                                        | 42,169           | 28,432           | 9,502            | 3,677                                    | 559            | 51,793            | 47,438           | 4,355                                    | -                | -              | 8,957          |
| Black walnut         | -                                        | -             | -              | -              | -                                        | -                | -                | -                | -                                        | -              | -                 | -                | -                                        | -                | -              | -              |
| Butternut            | -                                        | -             | -              | -              | -                                        | -                | -                | -                | -                                        | -              | -                 | -                | -                                        | -                | -              | -              |
| Yellow-poplar        | -                                        | -             | -              | -              | -                                        | -                | -                | -                | -                                        | -              | -                 | -                | -                                        | -                | -              | -              |
| Sassafras            | -                                        | -             | -              | -              | -                                        | -                | -                | -                | -                                        | -              | -                 | -                | -                                        | -                | -              | -              |
| Other hardwoods      | -                                        | -             | -              | -              | -                                        | -                | -                | -                | -                                        | -              | -                 | -                | -                                        | -                | -              | -              |
| <b>Total</b>         | <b>1,479,456</b>                         | <b>52,097</b> | <b>798,435</b> | <b>394,670</b> | <b>234,254</b>                           | <b>3,189,668</b> | <b>1,348,826</b> | <b>1,268,488</b> | <b>492,158</b>                           | <b>80,196</b>  | <b>6,344,262</b>  | <b>4,217,848</b> | <b>1,403,029</b>                         | <b>516,989</b>   | <b>206,396</b> | <b>806,817</b> |
| <b>All species</b>   | <b>1,791,537</b>                         | <b>97,529</b> | <b>915,177</b> | <b>456,981</b> | <b>321,850</b>                           | <b>3,761,275</b> | <b>1,491,264</b> | <b>1,434,485</b> | <b>626,803</b>                           | <b>214,723</b> | <b>13,175,622</b> | <b>8,448,784</b> | <b>2,885,013</b>                         | <b>1,243,587</b> | <b>598,228</b> | <b>888,675</b> |

(Table 15 continued on next page)

(Table 15 continued)

## Northern Lower Peninsula

| Species group        | Log grade 1                              |               |                  |                | Log grade 2                              |                  |                  |                  | Log grade 3                              |                |                   |                   | Log grade 4                              |                |                |                  |
|----------------------|------------------------------------------|---------------|------------------|----------------|------------------------------------------|------------------|------------------|------------------|------------------------------------------|----------------|-------------------|-------------------|------------------------------------------|----------------|----------------|------------------|
|                      | Diameter class (inches at breast height) |               |                  |                | Diameter class (inches at breast height) |                  |                  |                  | Diameter class (inches at breast height) |                |                   |                   | Diameter class (inches at breast height) |                |                |                  |
|                      | Total                                    | 9.0-14.9      | 15.0-18.9        | 19.0-20.9      | 21.0+                                    | Total            | 9.0-14.9         | 15.0-18.9        | 19.0-20.9                                | 21.0+          | Total             | 9.0-14.9          | 15.0-18.9                                | 19.0-20.9      | 21.0+          | Total            |
| <b>Softwoods</b>     |                                          |               |                  |                |                                          |                  |                  |                  |                                          |                |                   |                   |                                          |                |                |                  |
| Jack pine            | 3,103                                    | 3,103         | -                | -              | -                                        | -                | -                | -                | -                                        | -              | 650,667           | 624,071           | 25,590                                   | 1,036          | -              | -                |
| Red pine             | 124,513                                  | 7,323         | 64,072           | 45,473         | 7,645                                    | -                | 187,108          | 61,441           | 83,885                                   | 16,099         | 5,693             | 2,537,323         | 1,971,140                                | 348,706        | 180,780        | 35,697           |
| White pine           | 150,692                                  | 4,870         | 47,642           | 28,705         | 69,475                                   | -                | 309,296          | 97,387           | 67,075                                   | 85,777         | 59,077            | 738,021           | 330,741                                  | 165,897        | 127,084        | 114,299          |
| White spruce         | 10,471                                   | -             | -                | 182            | 253                                      | -                | -                | -                | -                                        | 691            | 956               | 153,284           | 116,766                                  | 26,743         | 4,101          | 5,674            |
| Black spruce         | -                                        | -             | -                | -              | -                                        | -                | 2,875            | 2,875            | -                                        | -              | -                 | 62,039            | 55,375                                   | 6,664          | -              | -                |
| Balsam fir           | -                                        | -             | -                | -              | -                                        | -                | 10,514           | 10,514           | -                                        | -              | -                 | 238,394           | 227,898                                  | 10,496         | -              | -                |
| Hemlock              | 10,217                                   | -             | 2,950            | 7,267          | -                                        | -                | 35,806           | 4,294            | 12,452                                   | -              | 19,060            | 363,458           | 182,525                                  | 93,264         | 54,378         | 33,291           |
| Tamarack             | 2,980                                    | -             | 2,962            | -              | 18                                       | -                | 5,091            | 5,044            | -                                        | 47             | -                 | 112,474           | 100,047                                  | 11,425         | -              | 1,002            |
| Eastern redcedar     | -                                        | -             | -                | -              | -                                        | -                | 106              | 106              | -                                        | -              | -                 | 2,560             | 1,708                                    | 852            | -              | -                |
| Northern white-cedar | -                                        | -             | -                | -              | -                                        | -                | 49,694           | 37,080           | 7,212                                    | 4,076          | 1,326             | 1,200,993         | 1,070,769                                | 108,235        | 21,989         | -                |
| Other softwoods      | -                                        | -             | -                | -              | -                                        | -                | -                | -                | -                                        | -              | -                 | 110,789           | 109,609                                  | 1,180          | -              | -                |
| <b>Total</b>         | <b>301,976</b>                           | <b>15,296</b> | <b>127,662</b>   | <b>81,627</b>  | <b>77,391</b>                            | <b>604,260</b>   | <b>240,844</b>   | <b>170,624</b>   | <b>106,643</b>                           | <b>86,149</b>  | <b>6,170,002</b>  | <b>4,790,649</b>  | <b>799,170</b>                           | <b>390,220</b> | <b>189,963</b> | <b>198,567</b>   |
|                      |                                          |               |                  |                |                                          |                  |                  |                  |                                          |                |                   |                   |                                          |                |                |                  |
| Species group        | Tree grade 1                             |               |                  |                | Tree grade 2                             |                  |                  |                  | Tree grade 3                             |                |                   |                   | Tree grade 4                             |                |                |                  |
|                      | Diameter class (inches at breast height) |               |                  |                | Diameter class (inches at breast height) |                  |                  |                  | Diameter class (inches at breast height) |                |                   |                   | Diameter class (inches at breast height) |                |                |                  |
|                      | Total                                    | 11.0-14.9     | 15.0-18.9        | 19.0-20.9      | 21.0+                                    | Total            | 11.0-14.9        | 15.0-18.9        | 19.0-20.9                                | 21.0+          | Total             | 11.0-14.9         | 15.0-18.9                                | 19.0-20.9      | 21.0+          | Total            |
| <b>Hardwoods</b>     |                                          |               |                  |                |                                          |                  |                  |                  |                                          |                |                   |                   |                                          |                |                |                  |
| Select white oak     | 75,402                                   | -             | 31,851           | 29,931         | 13,620                                   | 257,849          | 116,936          | 97,584           | 24,391                                   | 18,938         | 431,975           | 269,294           | 105,900                                  | 31,767         | 25,014         | 142,263          |
| Select red oak       | 547,704                                  | -             | 203,967          | 200,016        | 143,721                                  | 1,182,142        | 439,916          | 386,959          | 239,279                                  | 95,988         | 1,206,011         | 757,539           | 265,055                                  | 120,041        | 63,376         | 374,081          |
| Other red oak        | 30,560                                   | -             | 12,801           | 14,111         | 3,648                                    | 88,610           | 19,215           | 43,226           | 14,732                                   | 11,437         | 274,393           | 98,822            | 88,376                                   | 54,572         | 32,623         | 185,623          |
| Select hickory       | 166                                      | 166           | -                | -              | -                                        | 481              | 481              | -                | -                                        | -              | 1,490             | 1,490             | -                                        | -              | -              | 1,008            |
| Other hickory        | 170                                      | 170           | -                | -              | -                                        | 494              | 494              | -                | -                                        | -              | 1,530             | 950               | -                                        | 580            | -              | 1,035            |
| Basswood             | 188,250                                  | 4,933         | 141,212          | 34,955         | 7,150                                    | 509,496          | 355,710          | 130,979          | 14,843                                   | 7,954          | 442,583           | 380,606           | 21,458                                   | 32,446         | 8,073          | 8,584            |
| Beech                | 102,442                                  | -             | 36,745           | 45,364         | 20,333                                   | 281,551          | 36,670           | 105,467          | 68,425                                   | 48,989         | 251,514           | 115,567           | 97,295                                   | 25,433         | 13,219         | 16,660           |
| Yellow birch         | 14,741                                   | -             | 8,770            | 5,971          | -                                        | 32,558           | 18,898           | 13,039           | 2,621                                    | -              | 61,905            | 53,103            | 5,315                                    | -              | 3,487          | 9,059            |
| Hard maple           | 232,304                                  | -             | 120,353          | 72,752         | 39,199                                   | 654,060          | 352,912          | 260,792          | 40,356                                   | -              | 1,116,202         | 876,780           | 126,075                                  | 53,550         | 59,797         | 189,982          |
| Soft maple           | 270,837                                  | -             | 125,752          | 51,972         | 93,113                                   | 767,959          | 341,485          | 310,892          | 80,605                                   | 34,977         | 1,348,004         | 982,472           | 236,657                                  | 120,697        | 28,178         | 234,102          |
| Elm                  | 16,481                                   | -             | 10,258           | 1,493          | 4,730                                    | 25,981           | 24,411           | -                | 1,570                                    | -              | 4,687             | 4,403             | -                                        | 284            | -              | 105              |
| Black ash            | 2,296                                    | 2,066         | -                | 157            | 73                                       | 37,540           | 22,435           | 12,061           | 2,075                                    | 969            | 50,390            | 38,209            | 7,582                                    | 3,135          | 1,464          | 4,522            |
| White & green ash    | 213,794                                  | 7,343         | 153,253          | 44,163         | 9,035                                    | 304,583          | 158,409          | 115,164          | 18,437                                   | 12,573         | 297,266           | 228,383           | 29,469                                   | 26,843         | 12,571         | 14,646           |
| Sycamore             | 1,608                                    | -             | 702              | 906            | -                                        | 2,290            | -                | 1,090            | 1,200                                    | -              | 2,235             | -                 | 8,758                                    | 6,940          | -              | 110              |
| Cottonwood           | 45,504                                   | -             | -                | 15,053         | 30,451                                   | 13,405           | 1,981            | 9,856            | 1,568                                    | -              | 7,566             | 4,291             | -                                        | 1,818          | -              | 2,336            |
| Willow               | 3,759                                    | -             | 3,759            | -              | -                                        | 14,108           | 2,324            | 8,125            | -                                        | 3,659          | -                 | -                 | -                                        | -              | -              | 5,557            |
| Hackberry            | -                                        | -             | -                | -              | -                                        | -                | -                | -                | -                                        | -              | -                 | -                 | -                                        | -              | -              | 402              |
| Balsam poplar        | 61,693                                   | -             | 24,666           | 34,629         | 2,398                                    | 106,789          | 44,611           | 51,802           | -                                        | 10,376         | 177,575           | 155,337           | -                                        | -              | -              | 683              |
| Bigtooth aspen       | 116,555                                  | -             | 85,931           | 30,624         | -                                        | 731,559          | 466,123          | 232,820          | 32,616                                   | -              | 1,351,424         | 1,049,445         | 229,036                                  | 46,450         | 22,238         | 47,551           |
| Quaking aspen        | 99,611                                   | -             | 64,208           | 14,862         | 20,541                                   | 545,815          | 254,359          | 237,449          | 54,007                                   | -              | 1,005,605         | 739,945           | 189,280                                  | 57,407         | 18,973         | 196,481          |
| Paper birch          | 5,774                                    | -             | 5,774            | -              | -                                        | 78,805           | 47,604           | 31,201           | -                                        | -              | 263,593           | 222,459           | 24,256                                   | 16,878         | -              | 231,052          |
| Tupelo               | 29                                       | 29            | -                | -              | -                                        | 392              | 392              | -                | -                                        | -              | 1,309             | 1,309             | -                                        | -              | -              | 31,302           |
| Black cherry         | 56,609                                   | -             | 39,407           | 15,325         | 1,877                                    | 75,596           | 50,235           | 21,098           | -                                        | 4,253          | 153,242           | 129,068           | 14,942                                   | -              | 9,234          | 156              |
| Black walnut         | -                                        | -             | -                | -              | -                                        | 3,703            | 675              | 3,028            | -                                        | -              | -                 | -                 | -                                        | -              | -              | 17,602           |
| Butternut            | -                                        | -             | -                | -              | -                                        | -                | -                | -                | -                                        | -              | 1,706             | 706               | 1,000                                    | -              | -              | 16,503           |
| Yellow-poplar        | -                                        | -             | -                | -              | -                                        | -                | -                | -                | -                                        | -              | -                 | -                 | -                                        | -              | -              | -                |
| Sassafras            | -                                        | -             | -                | -              | -                                        | -                | -                | -                | -                                        | -              | -                 | -                 | -                                        | -              | -              | -                |
| Other hardwoods      | -                                        | -             | -                | -              | -                                        | 5,590            | 3,953            | 1,637            | -                                        | -              | 4,833             | 3,418             | -                                        | -              | -              | -                |
| <b>Total</b>         | <b>2,086,289</b>                         | <b>14,707</b> | <b>1,069,409</b> | <b>612,284</b> | <b>389,889</b>                           | <b>5,681,336</b> | <b>2,760,229</b> | <b>2,074,269</b> | <b>596,725</b>                           | <b>250,113</b> | <b>8,465,796</b>  | <b>6,100,534</b>  | <b>1,444,202</b>                         | <b>593,045</b> | <b>328,015</b> | <b>1,713,712</b> |
| <b>All species</b>   | <b>2,388,265</b>                         | <b>30,003</b> | <b>1,197,071</b> | <b>693,911</b> | <b>467,280</b>                           | <b>6,285,596</b> | <b>3,001,073</b> | <b>2,244,893</b> | <b>703,368</b>                           | <b>336,282</b> | <b>14,635,796</b> | <b>10,891,183</b> | <b>2,243,372</b>                         | <b>983,265</b> | <b>517,978</b> | <b>1,912,279</b> |

(Table 15 continued on next page)

**Southern Lower Peninsula**

| Species group        | Log grade 1                              |           |                  |                | Log grade 2                              |                  |                  |                  | Log grade 3                              |                |                  |                  | Log grade 4                              |                |                |                  |
|----------------------|------------------------------------------|-----------|------------------|----------------|------------------------------------------|------------------|------------------|------------------|------------------------------------------|----------------|------------------|------------------|------------------------------------------|----------------|----------------|------------------|
|                      | Diameter class (inches at breast height) |           |                  |                | Diameter class (inches at breast height) |                  |                  |                  | Diameter class (inches at breast height) |                |                  |                  | Diameter class (inches at breast height) |                |                |                  |
|                      | Total                                    | 9.0-14.9  | 15.0-18.9        | 19.0-20.9      | 21.0+                                    | Total            | 9.0-14.9         | 15.0-18.9        | 19.0-20.9                                | 21.0+          | Total            | 9.0-14.9         | 15.0-18.9                                | 19.0-20.9      | 21.0+          | Total            |
| <b>Softwoods</b>     |                                          |           |                  |                |                                          |                  |                  |                  |                                          |                |                  |                  |                                          |                |                |                  |
| Jack pine            | -                                        | -         | -                | -              | -                                        | -                | -                | -                | -                                        | -              | 33,556           | 33,556           | -                                        | -              | -              | -                |
| Red pine             | -                                        | -         | -                | -              | -                                        | -                | -                | -                | -                                        | -              | 285,654          | 257,505          | 28,149                                   | -              | -              | -                |
| White pine           | 25,364                                   | -         | 6,477            | -              | 18,887                                   | -                | 20,484           | 20,484           | -                                        | -              | 330,785          | 145,608          | 58,134                                   | 66,792         | 31,805         | 17,500           |
| White spruce         | -                                        | -         | -                | -              | -                                        | -                | -                | -                | -                                        | -              | 24,342           | 24,342           | -                                        | -              | -              | -                |
| Black spruce         | -                                        | -         | -                | -              | -                                        | -                | -                | -                | -                                        | -              | -                | -                | -                                        | -              | -              | -                |
| Balsam fir           | -                                        | -         | -                | -              | -                                        | 290              | 290              | -                | -                                        | -              | 1,713            | 1,713            | -                                        | -              | -              | -                |
| Hemlock              | -                                        | -         | -                | -              | -                                        | 5,876            | 5,876            | 2,949            | 2,927                                    | 13,995         | 34,675           | 10,671           | 2,970                                    | 7,039          | -              | -                |
| Tamarack             | -                                        | -         | -                | -              | -                                        | 22,577           | 20,449           | 2,128            | -                                        | -              | 13,294           | 13,294           | -                                        | -              | -              | -                |
| Eastern redcedar     | -                                        | -         | -                | -              | -                                        | -                | -                | -                | -                                        | -              | 2,211            | 2,211            | -                                        | -              | -              | -                |
| Northern white-cedar | -                                        | -         | -                | -              | -                                        | -                | -                | -                | -                                        | -              | 17,308           | 16,086           | 1,222                                    | -              | -              | -                |
| Other softwoods      | -                                        | -         | -                | -              | -                                        | -                | -                | -                | -                                        | -              | 96,372           | 80,610           | 12,039                                   | 3,723          | -              | -                |
| <b>Total</b>         | <b>25,364</b>                            | -         | <b>6,477</b>     | -              | <b>18,887</b>                            | <b>49,227</b>    | <b>41,223</b>    | <b>5,077</b>     | -                                        | <b>2,927</b>   | <b>639,910</b>   | <b>585,596</b>   | <b>102,514</b>                           | <b>77,554</b>  | <b>31,805</b>  | <b>17,600</b>    |
| <b>Tree grade 2</b>  |                                          |           |                  |                |                                          |                  |                  |                  |                                          |                |                  |                  |                                          |                |                |                  |
| Species group        | Tree grade 1                             |           |                  |                | Tree grade 2                             |                  |                  |                  | Tree grade 3                             |                |                  |                  | Tree grade 4                             |                |                |                  |
|                      | Diameter class (inches at breast height) |           |                  |                | Diameter class (inches at breast height) |                  |                  |                  | Diameter class (inches at breast height) |                |                  |                  | Diameter class (inches at breast height) |                |                |                  |
|                      | Total                                    | 11.0-14.9 | 15.0-18.9        | 19.0-20.9      | 21.0+                                    | Total            | 11.0-14.9        | 15.0-18.9        | 19.0-20.9                                | 21.0+          | Total            | 11.0-14.9        | 15.0-18.9                                | 19.0-20.9      | 21.0+          | Total            |
| <b>Hardwoods</b>     |                                          |           |                  |                |                                          |                  |                  |                  |                                          |                |                  |                  |                                          |                |                |                  |
| Select white oak     | 325,170                                  | -         | 96,441           | 89,467         | 137,262                                  | 569,874          | 91,848           | 172,751          | 121,921                                  | 183,354        | 655,556          | 220,753          | 180,417                                  | 130,118        | 124,268        | 196,701          |
| Selected red oak     | 398,618                                  | -         | 69,931           | 151,342        | 177,345                                  | 462,392          | 114,043          | 155,262          | 127,732                                  | 65,355         | 533,336          | 214,466          | 156,260                                  | 54,649         | 107,961        | 354,733          |
| Other red oak        | 129,416                                  | -         | 37,099           | 62,286         | 30,031                                   | 225,124          | 49,303           | 90,583           | 55,007                                   | 30,231         | 229,675          | 91,110           | 90,798                                   | 15,742         | 32,025         | 156,625          |
| Select hickory       | 38,409                                   | -         | 13,529           | 24,880         | -                                        | 77,533           | 38,724           | 36,809           | -                                        | -              | 101,769          | 59,331           | 28,832                                   | -              | 13,606         | 50,552           |
| Other hickory        | 31,764                                   | -         | 30,959           | -              | 805                                      | 48,636           | 40,507           | 6,607            | -                                        | 1,522          | 56,219           | 45,312           | 9,156                                    | -              | 1,748          | 37,181           |
| Basswood             | 136,801                                  | -         | 54,138           | 62,320         | 20,143                                   | 144,253          | 89,747           | 28,782           | -                                        | -              | 115,284          | 59,512           | 13,899                                   | 10,133         | 31,810         | 17,344           |
| Beech                | 88,249                                   | -         | -                | -              | 88,249                                   | 100,463          | -                | -                | -                                        | -              | 101,362          | 32,796           | 13,698                                   | 18,456         | 36,412         | 17,344           |
| Yellow birch         | -                                        | -         | -                | -              | -                                        | 3,892            | 2,673            | -                | 39,794                                   | 31,887         | 20,711           | 14,220           | -                                        | 3,050          | 3,441          | 4,739            |
| Hard maple           | 303,208                                  | -         | 149,943          | 96,129         | 57,136                                   | 177,106          | 79,665           | 36,083           | 46,049                                   | 15,309         | 171,030          | 71,342           | 49,379                                   | 24,552         | 25,757         | 48,389           |
| Soft maple           | 767,365                                  | -         | 321,157          | 212,952        | 233,276                                  | 583,327          | 155,307          | 185,071          | 107,358                                  | 135,591        | 677,893          | 270,280          | 178,309                                  | 100,328        | 129,078        | 235,484          |
| Elm                  | 11,799                                   | -         | 11,176           | 623            | -                                        | 49,029           | 29,445           | 17,467           | 2,117                                    | -              | 163,200          | 121,550          | 31,442                                   | 6,725          | 3,483          | 24,066           |
| Black ash            | 307,010                                  | -         | 149,123          | 110,865        | 47,022                                   | 417,129          | 168,304          | 142,095          | 35,550                                   | 71,180         | 633,359          | 45,425           | 11,767                                   | 2,445          | 3,722          | 3,870            |
| White & green ash    | 26,488                                   | -         | 1,913            | 3,291          | 21,284                                   | 36,332           | 7,677            | 28,655           | 41,996                                   | -              | 356,020          | 280,525          | 52,164                                   | 14,486         | 8,845          | 84,227           |
| Sycamore             | 93,142                                   | -         | 25,818           | 14,066         | 5,020                                    | 101,562          | 13,848           | 45,716           | 12,681                                   | -              | 201,283          | 48,737           | 42,225                                   | 21,358         | 11,853         | 6,035            |
| Cottonwood           | 5,020                                    | -         | -                | -              | -                                        | 45,854           | 2,749            | -                | -                                        | -              | 32,590           | 20,737           | -                                        | -              | -              | 25,514           |
| Willow               | 1,198                                    | -         | 1,198            | -              | -                                        | 2,176            | 989              | 612              | 575                                      | -              | 46,051           | 25,615           | 10,525                                   | 11,911         | -              | 1,210            |
| Hickory              | 6,734                                    | -         | 1,393            | 1,918          | 3,423                                    | 3,970            | 1,981            | 838              | 1,151                                    | -              | 2,960            | 2,960            | -                                        | -              | -              | 3,655            |
| Balsam poplar        | -                                        | -         | -                | -              | -                                        | -                | -                | -                | -                                        | -              | 15,105           | 7,537            | 3,184                                    | 4,384          | -              | 1,824            |
| Bigtooth aspen       | -                                        | -         | -                | -              | -                                        | 45,743           | 32,992           | 11,631           | 591                                      | 529            | 127,472          | 93,730           | 30,590                                   | 1,663          | -              | 3,655            |
| Quaking aspen        | 13,499                                   | -         | 9,099            | 4,400          | -                                        | 11,173           | 8,096            | 3,077            | -                                        | -              | 24,655           | 18,176           | 4,626                                    | 1,853          | -              | 2,259            |
| Paper birch          | -                                        | -         | -                | -              | -                                        | -                | -                | -                | -                                        | -              | 9,385            | 4,422            | -                                        | -              | -              | 2,528            |
| Tupelo               | -                                        | -         | -                | -              | -                                        | 167,670          | 89,449           | 48,093           | 24,898                                   | 5,230          | 283,032          | 186,390          | 69,538                                   | 18,037         | 9,067          | 26,714           |
| Black cherry         | 76,641                                   | -         | 46,650           | 27,752         | 2,239                                    | 71,144           | 42,234           | 20,310           | 6,004                                    | 2,586          | 49,118           | 28,446           | 8,770                                    | 6,598          | 5,304          | 9,067            |
| Black walnut         | 31,645                                   | -         | 22,056           | 9,589          | -                                        | 19,167           | 12,120           | 5,614            | 1,433                                    | -              | 3,823            | 3,577            | -                                        | -              | -              | 5,384            |
| Butternut            | -                                        | -         | -                | -              | -                                        | 86,263           | 32,081           | 28,955           | 25,827                                   | -              | 44,361           | 14,667           | -                                        | -              | -              | 246              |
| Yellow-poplar        | 27,454                                   | -         | 6,205            | 9,059          | 12,190                                   | 11,602           | 4,296            | 7,245            | -                                        | 61             | 39,428           | 37,712           | 13,026                                   | 12,161         | 4,527          | 4,637            |
| Sassafras            | 8,289                                    | -         | 8,242            | -              | 47                                       | 7,426            | 6,838            | -                | -                                        | -              | 24,643           | 13,810           | 8,787                                    | 780            | 1,716          | 1,716            |
| Other hardwoods      | 4,502                                    | -         | 4,401            | -              | 101                                      | 3,520            | 1,141            | 1,505            | 1,160                                    | 744            | 4,215            | 2,074            | 580                                      | 1,027          | 745            | 1,396            |
| <b>Total</b>         | <b>2,832,241</b>                         | -         | <b>1,062,471</b> | <b>880,939</b> | <b>888,831</b>                           | <b>3,520,130</b> | <b>1,141,505</b> | <b>1,160,744</b> | <b>648,345</b>                           | <b>569,536</b> | <b>4,215,561</b> | <b>2,074,580</b> | <b>1,027,745</b>                         | <b>473,961</b> | <b>639,275</b> | <b>1,463,732</b> |
| <b>All species</b>   | <b>2,857,605</b>                         | -         | <b>1,068,948</b> | <b>880,939</b> | <b>907,718</b>                           | <b>3,569,357</b> | <b>1,182,728</b> | <b>1,165,821</b> | <b>648,345</b>                           | <b>572,463</b> | <b>5,055,471</b> | <b>2,660,176</b> | <b>1,130,259</b>                         | <b>551,515</b> | <b>713,521</b> | <b>1,544,277</b> |

(Table 15 continued on next page)

(Table 15 continued)

| All Units            | Log grade 1                              |                |                  |                  | Log grade 2                              |                   |                  |                  | Log grade 3                              |                  |                   |                   | Log grade 4                              |                  |                  |          |
|----------------------|------------------------------------------|----------------|------------------|------------------|------------------------------------------|-------------------|------------------|------------------|------------------------------------------|------------------|-------------------|-------------------|------------------------------------------|------------------|------------------|----------|
|                      | Diameter class (inches at breast height) |                |                  |                  | Diameter class (inches at breast height) |                   |                  |                  | Diameter class (inches at breast height) |                  |                   |                   | Diameter class (inches at breast height) |                  |                  |          |
|                      | Total                                    | 9.0-14.9       | 15.0-18.9        | 19.0-20.9        | 21.0+                                    | Total             | 9.0-14.9         | 15.0-18.9        | 19.0-20.9                                | 21.0+            | Total             | 9.0-14.9          | 15.0-18.9                                | 19.0-20.9        | 21.0+            | Total    |
| <b>Species group</b> |                                          |                |                  |                  |                                          |                   |                  |                  |                                          |                  |                   |                   |                                          |                  |                  |          |
| <b>Softwoods</b>     |                                          |                |                  |                  |                                          |                   |                  |                  |                                          |                  |                   |                   |                                          |                  |                  |          |
| Jack pine            | 3,103                                    | 3,103          | -                | -                | -                                        | 8,429             | 8,341            | 53               | 35                                       | -                | 1,463,068         | 1,368,656         | 90,569                                   | 3,843            | -                | -        |
| Red pine             | 260,262                                  | 49,477         | 133,149          | 69,991           | 7,645                                    | 235,884           | 85,761           | 117,782          | 23,382                                   | 8,959            | 4,295,782         | 3,376,186         | 571,037                                  | 282,239          | 66,330           | -        |
| White pine           | 539,065                                  | 11,612         | 138,313          | 140,490          | 248,450                                  | 887,039           | 263,801          | 212,882          | 188,598                                  | 221,758          | 2,002,610         | 758,446           | 437,048                                  | 433,474          | 373,642          | 108,198  |
| White spruce         | 11,639                                   | -              | 11,204           | 182              | 253                                      | 62,863            | 34,812           | 10,300           | 2,397                                    | 15,354           | 1,875,634         | 1,260,162         | 468,753                                  | 128,885          | 17,834           | -        |
| Black spruce         | -                                        | -              | -                | -                | -                                        | 4,670             | 4,670            | -                | -                                        | -                | 504,231           | 453,396           | 43,002                                   | 7,833            | 3,393            | -        |
| Balsam fir           | 86,568                                   | -              | -                | -                | -                                        | 10,804            | 10,804           | -                | -                                        | -                | 1,470,224         | 1,386,850         | 74,884                                   | 5,097            | -                | -        |
| Hemlock              | 2,980                                    | -              | 35,024           | 21,009           | 18                                       | 325,574           | 47,012           | 124,147          | 100,081                                  | 54,334           | 2,741,970         | 1,105,195         | 829,798                                  | 459,174          | 347,703          | -        |
| Tamarack             | -                                        | -              | 2,962            | -                | -                                        | 54,289            | 37,470           | 13,395           | 3,266                                    | 158              | 373,413           | 303,157           | 34,725                                   | 3,503            | 2,028            | -        |
| Eastern redcedar     | -                                        | -              | -                | -                | -                                        | 106               | 106              | -                | -                                        | -                | 4,771             | 3,919             | -                                        | 852              | -                | -        |
| Northern white-cedar | 7,606                                    | -              | 2,369            | 5,237            | -                                        | 109,850           | 75,956           | 28,492           | 4,076                                    | 1,326            | 4,578,440         | 3,745,580         | 629,934                                  | 170,967          | 32,959           | -        |
| Other softwoods      | -                                        | -              | -                | -                | -                                        | 1,699,508         | 588,793          | 507,051          | 321,835                                  | 301,889          | 19,537,105        | 13,999,547        | 3,194,079                                | 1,499,590        | 843,889          | -        |
| <b>Total</b>         | <b>911,223</b>                           | <b>64,392</b>  | <b>323,021</b>   | <b>246,435</b>   | <b>277,375</b>                           | <b>1,699,508</b>  | <b>588,793</b>   | <b>507,051</b>   | <b>321,835</b>                           | <b>301,889</b>   | <b>19,537,105</b> | <b>13,999,547</b> | <b>3,194,079</b>                         | <b>1,499,590</b> | <b>843,889</b>   | <b>-</b> |
|                      |                                          |                |                  |                  |                                          |                   |                  |                  |                                          |                  |                   |                   |                                          |                  |                  |          |
| Species group        | Tree grade 1                             |                |                  |                  | Tree grade 2                             |                   |                  |                  | Tree grade 3                             |                  |                   |                   | Tree grade 4                             |                  |                  |          |
|                      | Diameter class (inches at breast height) |                |                  |                  | Diameter class (inches at breast height) |                   |                  |                  | Diameter class (inches at breast height) |                  |                   |                   | Diameter class (inches at breast height) |                  |                  |          |
|                      | Total                                    | 11.0-14.9      | 15.0-18.9        | 19.0-20.9        | 21.0+                                    | Total             | 11.0-14.9        | 15.0-18.9        | 19.0-20.9                                | 21.0+            | Total             | 11.0-14.9         | 15.0-18.9                                | 19.0-20.9        | 21.0+            | Total    |
| <b>Hardwoods</b>     |                                          |                |                  |                  |                                          |                   |                  |                  |                                          |                  |                   |                   |                                          |                  |                  |          |
| Select white oak     | 400,572                                  | -              | 130,292          | 119,398          | 150,882                                  | 827,723           | 208,784          | 270,335          | 146,312                                  | 202,292          | 1,092,624         | 493,829           | 286,860                                  | 162,653          | 149,282          | 25,019   |
| Select red oak       | 1,037,463                                | -              | 295,950          | 393,723          | 347,790                                  | 1,775,668         | 600,905          | 614,518          | 396,485                                  | 163,760          | 1,912,247         | 1,092,895         | 456,489                                  | 185,980          | 178,883          | 31,539   |
| Other red oak        | 159,976                                  | -              | 48,900           | 76,397           | 33,679                                   | 313,734           | 68,518           | 133,909          | 69,739                                   | 41,668           | 504,068           | 189,932           | 179,174                                  | 70,314           | 64,648           | 12,913   |
| Select hickory       | 38,575                                   | 166            | 13,529           | 24,880           | -                                        | 78,014            | 39,205           | 38,809           | -                                        | -                | 103,259           | 60,821            | 28,832                                   | -                | 13,606           | -        |
| Other hickory        | 31,934                                   | 170            | 30,959           | 140,315          | 45,300                                   | 49,130            | 41,001           | 6,607            | -                                        | -                | 58,887            | 46,606            | 9,156                                    | 580              | 2,545            | -        |
| Basswood             | 511,627                                  | 12,882         | 313,130          | 140,315          | 45,300                                   | 945,297           | 621,637          | 280,603          | 29,113                                   | 13,944           | 1,014,004         | 837,772           | 70,678                                   | 63,774           | 41,782           | 10,042   |
| Beech                | 251,504                                  | -              | 68,046           | 63,689           | 119,559                                  | 605,356           | 135,711          | 226,417          | 145,572                                  | 97,656           | 616,946           | 258,755           | 223,147                                  | 85,415           | 49,631           | 7,938    |
| Yellow birch         | 225,124                                  | -              | 121,721          | 70,128           | 33,277                                   | 410,314           | 162,519          | 163,770          | 67,938                                   | 16,087           | 755,250           | 396,167           | 189,836                                  | 93,398           | 75,849           | 3,590    |
| Hard maple           | 1,347,919                                | -              | 670,356          | 430,337          | 247,226                                  | 2,855,979         | 1,105,361        | 1,169,411        | 456,446                                  | 124,761          | 4,315,769         | 2,966,969         | 814,351                                  | 359,779          | 174,670          | 83,148   |
| Soft maple           | 1,203,363                                | -              | 549,221          | 309,067          | 345,075                                  | 2,059,744         | 827,950          | 801,898          | 250,047                                  | 179,849          | 3,633,907         | 2,286,426         | 785,830                                  | 379,531          | 182,120          | 392      |
| Elm                  | 143,774                                  | 47,458         | 61,409           | 16,512           | 18,395                                   | 81,802            | 53,658           | 22,981           | 4,824                                    | 141              | 181,826           | 134,692           | 33,442                                   | 11,638           | 4,054            | 472      |
| Black ash            | 21,934                                   | 2,068          | 15,692           | 2,451            | 1,725                                    | 178,554           | 106,138          | 54,334           | 14,226                                   | 3,856            | 257,286           | 213,418           | 33,102                                   | 5,580            | 1,166            | 24,129   |
| White & green ash    | 7,343                                    | 347,612        | 180,411          | 60,829           | 21,284                                   | 792,606           | 376,829          | 278,037          | 53,987                                   | 83,753           | 723,899           | 571,407           | 89,747                                   | 41,329           | 21,416           | -        |
| Sycamore             | 28,096                                   | -              | 2,615            | 4,197            | 21,284                                   | 38,622            | 7,677            | 29,745           | 1,200                                    | -                | 34,825            | 20,737            | 1,091                                    | 12,997           | -                | -        |
| Cottonwood           | 138,646                                  | -              | 25,818           | 29,119           | 83,709                                   | 114,967           | 15,829           | 55,574           | 43,564                                   | 26,452           | 210,041           | 55,677            | 42,225                                   | 23,176           | 88,963           | -        |
| Willow               | 9,264                                    | 485            | 3,759            | -                | 5,020                                    | 60,749            | 5,324            | 21,322           | 7,651                                    | -                | 56,201            | 30,034            | 10,961                                   | 11,911           | 3,275            | -        |
| Hackberry            | 1,196                                    | -              | 1,198            | -                | -                                        | 2,176             | 989              | 612              | 575                                      | -                | 2,960             | 2,960             | -                                        | -                | -                | -        |
| Balsam poplar        | 147,250                                  | -              | 69,537           | 56,839           | 20,874                                   | 283,890           | 116,980          | 122,003          | 27,614                                   | 17,293           | 416,964           | 321,979           | 44,604                                   | 25,857           | 24,524           | 4,245    |
| Bigtooth aspen       | 220,756                                  | -              | 164,942          | 55,425           | 389                                      | 954,817           | 580,254          | 319,382          | 54,301                                   | 880              | 1,779,509         | 1,375,825         | 295,608                                  | 66,943           | 40,933           | 1,514    |
| Quaking aspen        | 31,352                                   | -              | 177,909          | 41,082           | 34,177                                   | 1,146,479         | 545,922          | 494,569          | 101,753                                  | 4,235            | 2,751,194         | 1,930,598         | 625,093                                  | 156,059          | 39,444           | 2,822    |
| Paper birch          | 29                                       | -              | 21,629           | 9,459            | 264                                      | 300,291           | 179,194          | 110,943          | 7,605                                    | -                | 778,225           | 673,825           | 79,825                                   | 18,731           | 5,844            | 614      |
| Tupelo               | 138,969                                  | 29             | 91,655           | 43,181           | 4,133                                    | 339,794           | 204,766          | 93,773           | 30,844                                   | 10,411           | 10,894            | 5,731             | 99,096                                   | 20,577           | 18,714           | 1,929    |
| Black cherry         | 31,645                                   | -              | 22,056           | 9,589            | -                                        | 74,847            | 42,909           | 23,338           | 6,004                                    | 2,596            | 49,118            | 28,446            | 8,770                                    | 6,598            | 5,304            | -        |
| Butternut            | -                                        | -              | -                | -                | -                                        | 19,844            | 12,120           | 6,291            | 1,433                                    | -                | 7,395             | 5,487             | 1,662                                    | 246              | -                | -        |
| Yellow-poplar        | 27,454                                   | -              | 6,205            | 9,059            | 12,190                                   | 86,263            | 32,081           | 28,355           | 25,827                                   | -                | 44,381            | 14,667            | 13,026                                   | 12,161           | -                | -        |
| Sassafras            | 8,289                                    | -              | 8,242            | -                | -                                        | 17,192            | 8,249            | 8,882            | -                                        | -                | 44,261            | 41,130            | 1,415                                    | -                | 1,716            | -        |
| Other hardwoods      | 4,502                                    | -              | 4,401            | -                | -                                        | 7,571             | 6,983            | -                | 61                                       | 223              | 25,044            | 14,211            | 8,787                                    | 780              | 1,266            | -        |
| <b>Total</b>         | <b>7,010,588</b>                         | <b>70,599</b>  | <b>3,267,783</b> | <b>2,085,476</b> | <b>1,586,730</b>                         | <b>14,421,815</b> | <b>6,108,083</b> | <b>5,376,318</b> | <b>1,943,283</b>                         | <b>994,131</b>   | <b>21,929,479</b> | <b>14,481,502</b> | <b>4,430,825</b>                         | <b>1,818,442</b> | <b>1,198,710</b> | <b>-</b> |
| <b>All species</b>   | <b>7,921,811</b>                         | <b>134,981</b> | <b>3,590,804</b> | <b>2,331,911</b> | <b>1,864,105</b>                         | <b>16,121,323</b> | <b>6,676,816</b> | <b>5,983,369</b> | <b>2,265,118</b>                         | <b>1,296,020</b> | <b>41,466,584</b> | <b>28,461,049</b> | <b>7,824,904</b>                         | <b>3,318,032</b> | <b>2,042,589</b> | <b>-</b> |

\* International 1/40inch rule.

Table 16. -- Net volume of growing stock and sawtimber on timberland by Forest Survey Unit, county, and major species group, Michigan, 1993

| Forest Survey Unit and county | Growing stock |                     |                 |           |                | Sawtimber   |                     |                 |           |                |                |
|-------------------------------|---------------|---------------------|-----------------|-----------|----------------|-------------|---------------------|-----------------|-----------|----------------|----------------|
|                               | All species   | Major species group |                 |           | Hard hardwoods | All species | Major species group |                 |           | Soft hardwoods | Hard hardwoods |
|                               |               | Pine                | Other softwoods | hardwoods |                |             | Pine                | Other softwoods | hardwoods |                |                |
| (In thousand cubic feet)      |               |                     |                 |           |                |             |                     |                 |           |                |                |
| Eastern Upper Peninsula       |               |                     |                 |           |                |             |                     |                 |           |                |                |
| Alger                         | 777,861       | 106,117             | 175,612         | 205,299   | 290,833        | 2,345,044   | 489,646             | 609,315         | 439,866   | 806,217        |                |
| Chippewa                      | 922,711       | 147,032             | 280,529         | 344,852   | 150,298        | 2,308,928   | 469,880             | 684,915         | 786,966   | 367,167        |                |
| Delta                         | 757,000       | 88,993              | 258,431         | 285,629   | 123,947        | 1,707,669   | 287,591             | 567,439         | 541,152   | 311,487        |                |
| Luce                          | 644,572       | 116,655             | 185,141         | 177,821   | 164,955        | 1,946,852   | 458,659             | 565,027         | 411,700   | 511,466        |                |
| Mackinac                      | 709,893       | 76,119              | 252,370         | 252,420   | 128,984        | 1,742,564   | 331,437             | 615,298         | 481,897   | 313,932        |                |
| Menominee                     | 647,139       | 34,015              | 240,771         | 228,782   | 143,571        | 1,308,806   | 140,463             | 477,790         | 388,861   | 301,692        |                |
| Schoolcraft                   | 644,812       | 120,699             | 193,382         | 201,590   | 129,141        | 1,739,594   | 464,103             | 478,241         | 422,711   | 374,539        |                |
| Total                         | 5,103,988     | 689,630             | 1,586,236       | 1,696,393 | 1,131,729      | 13,099,457  | 2,641,779           | 3,598,025       | 3,473,153 | 2,986,500      |                |
| Western Upper Peninsula       |               |                     |                 |           |                |             |                     |                 |           |                |                |
| Baraga                        | 843,163       | 25,937              | 210,326         | 250,288   | 356,612        | 2,579,752   | 117,222             | 779,882         | 637,683   | 1,044,965      |                |
| Dickinson                     | 584,033       | 32,995              | 170,765         | 252,266   | 128,007        | 1,346,871   | 142,933             | 403,266         | 594,774   | 205,898        |                |
| Gogebic                       | 948,485       | 36,313              | 249,353         | 293,108   | 369,711        | 2,460,845   | 136,997             | 885,805         | 636,386   | 801,457        |                |
| Houghton                      | 904,393       | 56,574              | 168,574         | 302,426   | 376,819        | 2,558,956   | 229,250             | 647,751         | 702,168   | 979,787        |                |
| Iron                          | 912,694       | 56,781              | 205,869         | 323,197   | 326,847        | 2,427,592   | 252,405             | 626,444         | 747,762   | 800,981        |                |
| Keweenaw                      | 331,297       | 20,899              | 106,283         | 96,870    | 107,245        | 958,909     | 99,911              | 341,495         | 221,508   | 295,995        |                |
| Marquette                     | 1,571,937     | 187,389             | 437,549         | 520,824   | 426,175        | 4,348,659   | 810,762             | 1,338,643       | 1,076,708 | 1,122,546      |                |
| Ontonagon                     | 1,088,163     | 47,752              | 212,780         | 445,838   | 381,793        | 2,941,725   | 188,252             | 801,888         | 1,034,969 | 916,616        |                |
| Total                         | 7,184,165     | 464,640             | 1,761,499       | 2,484,817 | 2,473,209      | 19,623,109  | 1,977,732           | 5,825,174       | 5,651,958 | 6,168,245      |                |
| Northern Lower Peninsula      |               |                     |                 |           |                |             |                     |                 |           |                |                |
| Alcona                        | 489,698       | 59,631              | 59,388          | 216,855   | 153,824        | 1,276,067   | 175,619             | 142,225         | 527,916   | 430,307        |                |
| Alpena                        | 308,377       | 32,395              | 86,524          | 155,077   | 34,381         | 747,372     | 131,415             | 179,072         | 347,224   | 89,661         |                |
| Antrim                        | 333,367       | 18,831              | 27,500          | 158,855   | 128,181        | 743,042     | 46,614              | 89,229          | 355,776   | 251,423        |                |
| Arenac                        | 145,505       | 12,838              | 5,236           | 96,214    | 31,217         | 364,939     | 44,301              | 10,940          | 215,052   | 94,646         |                |
| Bay                           | 56,318        | -                   | -               | 46,683    | 9,635          | 130,943     | -                   | -               | 98,551    | 32,392         |                |
| Benzie                        | 225,371       | 42,803              | 13,158          | 76,065    | 93,345         | 563,958     | 73,967              | 34,406          | 207,102   | 248,483        |                |
| Charlevoix                    | 373,313       | 33,571              | 73,446          | 122,610   | 143,686        | 1,025,708   | 138,400             | 188,316         | 336,287   | 362,705        |                |
| Cheboygan                     | 437,126       | 66,354              | 66,205          | 190,445   | 114,122        | 1,028,314   | 216,281             | 164,779         | 447,880   | 199,374        |                |
| Clare                         | 328,363       | 54,546              | 14,033          | 165,869   | 93,915         | 818,238     | 149,140             | 31,626          | 327,092   | 310,380        |                |
| Crawford                      | 305,347       | 103,661             | 16,343          | 74,003    | 111,340        | 717,265     | 329,082             | 30,555          | 115,870   | 241,758        |                |
| Emmet                         | 369,457       | 19,984              | 35,514          | 144,519   | 169,440        | 893,012     | 77,759              | 80,956          | 370,216   | 364,081        |                |
| Gladwin                       | 212,002       | 18,463              | 3,669           | 157,635   | 32,235         | 498,114     | 60,462              | 7,451           | 341,742   | 88,459         |                |
| Grand Traverse                | 271,775       | 93,864              | 24,997          | 85,924    | 66,990         | 603,683     | 131,380             | 63,450          | 212,887   | 195,966        |                |
| Iosco                         | 313,397       | 91,258              | 45,304          | 129,187   | 47,648         | 801,111     | 256,874             | 110,922         | 321,952   | 111,363        |                |
| Isabella                      | 141,812       | 6,291               | 4,068           | 84,282    | 45,030         | 401,141     | 8,850               | 14,284          | 212,105   | 165,902        |                |
| Kalkaska                      | 375,036       | 117,683             | 27,663          | 114,165   | 115,525        | 797,283     | 241,100             | 74,723          | 246,036   | 235,424        |                |
| Lake                          | 441,897       | 123,828             | 17,381          | 104,441   | 196,247        | 1,250,368   | 369,629             | 35,086          | 233,427   | 612,226        |                |
| Leelanau                      | 175,649       | 24,605              | 11,282          | 34,261    | 105,501        | 500,634     | 57,235              | 30,981          | 89,816    | 322,602        |                |
| Manistee                      | 368,393       | 73,384              | 14,208          | 131,178   | 149,623        | 963,333     | 144,587             | 39,771          | 341,116   | 437,859        |                |
| Mason                         | 235,118       | 51,614              | 3,158           | 93,139    | 87,207         | 602,150     | 84,716              | 9,488           | 227,985   | 279,961        |                |
| Mecosta                       | 211,754       | 23,458              | 15,861          | 121,864   | 50,571         | 533,837     | 84,068              | 38,610          | 267,522   | 143,637        |                |
| Midland                       | 229,882       | 13,175              | 4,068           | 158,814   | 53,825         | 601,748     | 58,691              | 11,470          | 376,609   | 154,978        |                |
| Missaukee                     | 296,677       | 51,617              | 40,260          | 137,513   | 67,287         | 703,572     | 150,421             | 96,589          | 268,108   | 188,454        |                |
| Montmorency                   | 341,804       | 63,149              | 37,378          | 137,348   | 103,569        | 825,677     | 233,152             | 69,434          | 260,461   | 262,630        |                |
| Newaygo                       | 540,658       | 103,935             | 15,055          | 185,833   | 235,835        | 1,595,786   | 282,791             | 50,189          | 512,132   | 750,674        |                |
| Ocean                         | 242,483       | 44,143              | 12,468          | 97,797    | 88,075         | 635,282     | 110,186             | 36,792          | 213,814   | 274,490        |                |
| Ogemaw                        | 287,607       | 41,682              | 25,304          | 146,543   | 74,078         | 630,710     | 90,276              | 46,565          | 332,816   | 161,053        |                |
| Osceola                       | 228,470       | 19,015              | 31,191          | 105,284   | 72,980         | 627,896     | 45,643              | 103,585         | 253,561   | 225,107        |                |
| Oscoda                        | 312,463       | 103,203             | 16,583          | 99,300    | 93,377         | 863,005     | 343,613             | 33,112          | 208,316   | 277,964        |                |
| Oshtego                       | 379,135       | 53,606              | 32,616          | 136,147   | 156,766        | 803,661     | 140,808             | 74,955          | 293,463   | 294,435        |                |
| Presque Isle                  | 376,369       | 52,351              | 111,121         | 155,461   | 57,436         | 855,698     | 199,149             | 245,737         | 298,774   | 112,038        |                |
| Roscommon                     | 353,659       | 58,334              | 56,638          | 124,193   | 114,494        | 922,614     | 222,194             | 97,927          | 263,740   | 338,753        |                |
| Wexford                       | 413,444       | 142,443             | 27,500          | 110,204   | 133,297        | 895,777     | 283,529             | 49,648          | 251,405   | 311,195        |                |
| Total                         | 10,121,726    | 1,815,633           | 977,703         | 4,097,708 | 3,230,682      | 25,221,938  | 4,981,932           | 2,292,873       | 9,376,753 | 8,570,380      |                |

(Table 16 continued on next page)

(Table 16 continued)

| Forest Survey<br>Unit and county | Growing stock       |           |                    |                   |                   | Sawtimber           |            |                    |                   |                   |
|----------------------------------|---------------------|-----------|--------------------|-------------------|-------------------|---------------------|------------|--------------------|-------------------|-------------------|
|                                  | Major species group |           |                    |                   |                   | Major species group |            |                    |                   |                   |
|                                  | All<br>species      | Pine      | Other<br>softwoods | Soft<br>hardwoods | Hard<br>hardwoods | All<br>species      | Pine       | Other<br>softwoods | Soft<br>hardwoods | Hard<br>hardwoods |
| <i>(In thousand cubic feet)</i>  |                     |           |                    |                   |                   |                     |            |                    |                   |                   |
| <i>(In thousand board feet)</i>  |                     |           |                    |                   |                   |                     |            |                    |                   |                   |
| Southern Lower Peninsula         |                     |           |                    |                   |                   |                     |            |                    |                   |                   |
| Allegan                          | 288,664             | 24,446    | 927                | 99,042            | 163,792           | 915,568             | 80,687     | 4,012              | 298,248           | 532,621           |
| Barry                            | 188,908             | 8,255     | 3,477              | 68,076            | 109,100           | 615,876             | 28,180     | 9,239              | 179,094           | 399,363           |
| Berrien                          | 140,413             | 3,784     | 544                | 75,391            | 60,694            | 480,145             | 8,510      | 3,035              | 248,863           | 219,737           |
| Branch                           | 88,461              | 211       | 174                | 57,418            | 30,658            | 281,880             | -          | 932                | 183,744           | 97,204            |
| Calhoun                          | 166,146             | 2,410     | -                  | 93,764            | 69,972            | 506,899             | 10,850     | -                  | 217,753           | 278,296           |
| Cass                             | 133,519             | 945       | 406                | 64,078            | 68,090            | 447,233             | 3,077      | 2,064              | 202,384           | 239,708           |
| Clinton                          | 58,400              | -         | -                  | 40,966            | 17,434            | 141,197             | -          | -                  | 104,660           | 36,537            |
| Eaton                            | 116,019             | 975       | -                  | 59,975            | 55,069            | 306,002             | 2,585      | -                  | 158,091           | 145,326           |
| Genesee                          | 74,295              | -         | -                  | 29,745            | 44,550            | 235,007             | -          | -                  | 79,746            | 155,261           |
| Gratiot                          | 71,764              | 3,064     | -                  | 34,662            | 34,038            | 211,308             | 8,471      | -                  | 98,445            | 104,392           |
| Hillsdale                        | 81,904              | 8,382     | 170                | 26,760            | 46,592            | 249,331             | 26,321     | -                  | 64,468            | 158,542           |
| Huron                            | 77,426              | -         | 866                | 59,341            | 17,219            | 212,598             | -          | -                  | 161,239           | 51,359            |
| Ingham                           | 79,607              | 513       | 855                | 39,340            | 38,899            | 245,674             | 2,407      | 4,455              | 117,640           | 121,172           |
| Ionia                            | 91,406              | 1,660     | 3,536              | 40,766            | 45,444            | 253,950             | 5,036      | 2,732              | 82,920            | 163,262           |
| Jackson                          | 122,578             | 2,275     | 165                | 36,967            | 83,171            | 401,393             | 5,563      | -                  | 94,366            | 301,464           |
| Kalamazoo                        | 115,629             | 19,144    | 1,271              | 58,836            | 36,378            | 360,820             | 73,469     | 3,234              | 184,457           | 99,660            |
| Kent                             | 211,556             | 13,079    | 250                | 86,884            | 111,343           | 639,037             | 58,874     | -                  | 217,632           | 362,531           |
| Lapeer                           | 120,494             | 16,253    | 3,544              | 50,895            | 49,802            | 341,043             | 33,617     | 14,375             | 127,632           | 165,419           |
| Lenawee                          | 94,475              | -         | 1,515              | 42,076            | 50,884            | 274,333             | -          | 1,787              | 102,078           | 170,468           |
| Livingston                       | 139,327             | 11,968    | -                  | 47,905            | 79,454            | 484,771             | 46,317     | -                  | 134,005           | 304,449           |
| Macomb                           | 52,108              | -         | 2,763              | 27,568            | 21,777            | 155,569             | -          | 6,210              | 70,925            | 78,434            |
| Monroe                           | 66,164              | -         | -                  | 20,533            | 45,631            | 210,369             | -          | -                  | 73,214            | 137,155           |
| Montcalm                         | 186,282             | 24,505    | 5,522              | 75,612            | 80,078            | 546,684             | 93,965     | 16,783             | 188,700           | 247,236           |
| Muskegon                         | 227,741             | 42,569    | 3,682              | 68,731            | 111,370           | 724,717             | 170,644    | 18,045             | 206,092           | 329,936           |
| Oakland                          | 127,158             | 1,514     | 293                | 48,586            | 76,765            | 383,490             | 7,083      | -                  | 101,011           | 275,396           |
| Ottawa                           | 112,721             | 18,815    | 1,781              | 42,189            | 49,170            | 361,539             | 58,271     | 7,731              | 113,269           | 182,268           |
| Saginaw                          | 114,969             | 7,045     | -                  | 50,639            | 57,285            | 315,243             | 27,096     | -                  | 99,972            | 188,175           |
| St. Clair                        | 160,466             | 10,226    | 1,185              | 58,376            | 90,316            | 497,791             | 54,596     | 5,015              | 170,531           | 267,649           |
| St. Joseph                       | 103,800             | 1,051     | 3,609              | 43,628            | 55,512            | 331,433             | 4,319      | 4,733              | 116,889           | 205,492           |
| Sanilac                          | 69,122              | 1,081     | 804                | 47,569            | 19,668            | 146,959             | 2,522      | 2,412              | 89,018            | 53,007            |
| Shiawassee                       | 92,292              | -         | -                  | 42,391            | 49,901            | 326,005             | -          | -                  | 140,275           | 185,730           |
| Tuscola                          | 127,122             | 1,761     | 4,189              | 84,124            | 36,869            | 314,352             | 6,982      | 9,016              | 188,519           | 109,835           |
| Van Buren                        | 163,593             | 7,754     | -                  | 71,490            | 84,349            | 497,213             | 32,818     | -                  | 172,410           | 291,985           |
| Washtenaw                        | 122,168             | -         | 1,516              | 30,378            | 90,274            | 442,787             | -          | 6,976              | 74,511            | 361,300           |
| Wayne                            | 52,028              | -         | -                  | 22,856            | 29,172            | 168,494             | -          | -                  | 53,584            | 114,910           |
| Total                            | 4,235,006           | 233,665   | 43,044             | 1,847,557         | 2,110,720         | 13,026,710          | 852,260    | 122,786            | 4,916,385         | 7,135,279         |
| All counties                     | 26,644,885          | 3,203,588 | 4,368,482          | 10,126,475        | 8,946,340         | 70,971,214          | 10,453,703 | 12,238,858         | 23,418,249        | 24,860,404        |

<sup>1</sup> International 1/4-inch rule.

Table 17. -- Net volume of all live trees and salvable dead trees on timberland by class of timber and major species group, Michigan, 1993

(In thousand cubic feet)

| Class of timber           | All species | Major species group |                 |                |
|---------------------------|-------------|---------------------|-----------------|----------------|
|                           |             | Pine                | Other softwoods | Soft hardwoods |
| Live trees                |             |                     |                 |                |
| Growing stock trees       |             |                     |                 |                |
| Sawtimber                 |             |                     |                 |                |
| Saw-log portion           | 11,499,314  | 1,772,858           | 2,056,917       | 3,728,309      |
| Upper stem portion        | 3,491,995   | 244,129             | 316,076         | 1,463,992      |
| Total                     | 14,991,309  | 2,016,987           | 2,372,993       | 5,192,301      |
| Poletimber                | 11,653,576  | 1,186,601           | 1,995,489       | 4,934,174      |
| All growing-stock trees   | 26,644,885  | 3,203,588           | 4,368,482       | 10,126,475     |
| Cull trees                |             |                     |                 |                |
| Short-log trees           | 581,364     | 27,538              | 72,235          | 217,672        |
| Rough trees <sup>1</sup>  |             |                     |                 | 263,919        |
| Sawtimber size            | 754,569     | 58,595              | 105,959         | 282,878        |
| Poletimber size           | 841,416     | 43,997              | 92,132          | 352,049        |
| Total                     | 1,595,985   | 102,592             | 198,091         | 634,927        |
| Rotten trees <sup>1</sup> |             |                     |                 |                |
| Sawtimber size            | 355,541     | 4,259               | 75,108          | 156,091        |
| Poletimber size           | 105,309     | 951                 | 19,704          | 57,230         |
| Total                     | 460,850     | 5,210               | 94,812          | 213,321        |
| All cull trees            | 2,638,199   | 135,340             | 365,138         | 1,065,920      |
| Salvable dead trees       |             |                     |                 |                |
| Sawtimber size            | 144,043     | 12,221              | 41,016          | 62,635         |
| Poletimber size           | 99,515      | 7,008               | 20,360          | 57,629         |
| All salvable dead trees   | 243,558     | 19,229              | 61,376          | 120,264        |
| All classes               | 30,108,006  | 3,385,695           | 4,867,231       | 11,530,331     |
|                           |             |                     |                 | 10,060,830     |

<sup>1</sup>Includes all noncommercial species.

Table 18. -- Net volume of all live trees and growing-stock trees on timberland by ownership class and major species group, Michigan, 1993  
(In thousand cubic feet)

| Ownership class      | All live trees      |           |           |            |            | Growing-stock trees |           |           |            |           |
|----------------------|---------------------|-----------|-----------|------------|------------|---------------------|-----------|-----------|------------|-----------|
|                      | Major species group |           |           |            |            | Major species group |           |           |            |           |
|                      | All species         | Pine      | softwoods | hardwoods  | Hard       | All species         | Pine      | softwoods | hardwoods  | Hard      |
| National forest      | 3,903,696           | 892,661   | 660,047   | 1,179,611  | 1,171,377  | 3,527,999           | 871,557   | 607,989   | 1,029,115  | 1,019,338 |
| Other federal        | 80,575              | 18,034    | 12,341    | 29,769     | 20,431     | 74,392              | 17,538    | 11,549    | 27,267     | 18,038    |
| State                | 5,341,522           | 960,778   | 1,049,628 | 1,968,045  | 1,363,071  | 4,907,405           | 921,827   | 970,087   | 1,784,898  | 1,230,593 |
| County and municipal | 418,327             | 69,197    | 46,564    | 142,603    | 159,963    | 379,496             | 66,758    | 42,220    | 128,456    | 142,062   |
| Indian               | 27,958              | -         | 4,462     | 11,642     | 11,854     | 26,492              | -         | 4,417     | 11,022     | 11,053    |
| Forest industry      | 2,610,652           | 74,070    | 754,252   | 729,072    | 1,053,258  | 2,335,644           | 72,208    | 691,597   | 647,633    | 924,206   |
| Individual           | 13,483,957          | 1,046,601 | 1,590,663 | 5,857,081  | 4,989,612  | 12,293,004          | 987,558   | 1,472,278 | 5,340,814  | 4,492,354 |
| Corporate            | 3,416,397           | 277,587   | 615,663   | 1,274,572  | 1,248,575  | 3,100,453           | 266,142   | 568,345   | 1,157,270  | 1,108,696 |
| All ownerships       | 29,283,084          | 3,338,928 | 4,733,620 | 11,192,395 | 10,018,141 | 26,644,885          | 3,203,588 | 4,368,482 | 10,126,475 | 8,946,340 |

Table 19. -- Net volume of growing stock on timberland by forest type group/local type and major species group, Michigan, 1993

(In thousand cubic feet)

| Forest type group/<br>local type | All<br>species | Major species group |                    |                   |                   |
|----------------------------------|----------------|---------------------|--------------------|-------------------|-------------------|
|                                  |                | Pine                | Other<br>softwoods | Soft<br>hardwoods | Hard<br>hardwoods |
| Softwood type groups             |                |                     |                    |                   |                   |
| White-red-jack pine              |                |                     |                    |                   |                   |
| Jack pine                        | 730,408        | 623,723             | 18,041             | 42,701            | 45,943            |
| Red pine                         | 1,612,009      | 1,426,478           | 25,610             | 85,803            | 74,118            |
| White pine                       | 398,749        | 280,006             | 35,312             | 53,264            | 30,167            |
| Total                            | 2,741,166      | 2,330,207           | 78,963             | 181,768           | 150,228           |
| Spruce-fir                       |                |                     |                    |                   |                   |
| Balsam fir                       | 625,706        | 47,342              | 375,049            | 183,543           | 19,772            |
| White spruce                     | 164,440        | 14,875              | 100,129            | 46,271            | 3,165             |
| Black spruce                     | 325,813        | 46,252              | 243,038            | 35,970            | 553               |
| Northern white-cedar             | 2,029,869      | 65,894              | 1,610,870          | 315,756           | 37,349            |
| Tamarack                         | 97,986         | 3,349               | 86,410             | 7,688             | 539               |
| Total                            | 3,243,814      | 177,712             | 2,415,496          | 589,228           | 61,378            |
| All softwood types               | 5,984,980      | 2,507,919           | 2,494,459          | 770,996           | 211,606           |
| Hardwood type groups             |                |                     |                    |                   |                   |
| Oak-hickory                      |                |                     |                    |                   |                   |
| Oak-hickory                      | 2,949,259      | 162,534             | 12,650             | 588,994           | 2,185,081         |
| Elm-ash-cottonwood               |                |                     |                    |                   |                   |
| Elm-ash-soft maple               | 2,046,580      | 32,702              | 240,246            | 1,422,208         | 351,424           |
| Maple-beech-birch                |                |                     |                    |                   |                   |
| Maple-beech-birch                | 11,805,898     | 327,567             | 135,495            | 4,452,403         | 5,890,433         |
| Aspen-birch                      |                |                     |                    |                   |                   |
| Aspen                            | 3,165,070      | 146,286             | 334,189            | 2,412,676         | 271,919           |
| Paper birch                      | 479,231        | 24,225              | 94,496             | 327,802           | 32,708            |
| Balsam poplar                    | 212,663        | 1,303               | 56,902             | 151,289           | 3,169             |
| Total                            | 3,856,964      | 171,814             | 485,587            | 2,891,767         | 307,796           |
| All hardwood types               | 20,658,701     | 694,617             | 1,873,978          | 9,355,372         | 8,734,734         |
| Nonstocked                       | 1,204          | 1,052               | 45                 | 107               | -                 |
| All forest types                 | 26,644,885     | 3,203,588           | 4,368,482          | 10,126,475        | 8,946,340         |

Table 20. -- Average net annual growth of growing stock and sawtimber on timberland by Forest Survey Unit, county, and major species group, Michigan, 1980-1992

| Forest Survey<br>Unit and county | Growing stock  |                     |                    |                   |                   | Sawtimber      |                     |                    |                   |                   |
|----------------------------------|----------------|---------------------|--------------------|-------------------|-------------------|----------------|---------------------|--------------------|-------------------|-------------------|
|                                  | All<br>species | Major species group |                    |                   |                   | All<br>species | Major species group |                    |                   |                   |
|                                  |                | Pine                | Other<br>softwoods | Soft<br>hardwoods | Hard<br>hardwoods |                | Pine                | Other<br>softwoods | Soft<br>hardwoods | Hard<br>hardwoods |
|                                  |                |                     |                    |                   |                   |                |                     |                    |                   |                   |
| Eastern Upper Peninsula          |                |                     |                    |                   |                   |                |                     |                    |                   |                   |
| Alger                            | 19,075         | 3,522               | 3,849              | 4,266             | 7,438             | 74,644         | 18,766              | 17,227             | 13,238            | 25,413            |
| Chippewa                         | 23,302         | 5,420               | 6,081              | 7,488             | 4,313             | 84,349         | 20,776              | 22,055             | 28,896            | 12,622            |
| Delta                            | 21,143         | 3,479               | 8,019              | 6,734             | 2,911             | 68,816         | 13,087              | 24,563             | 20,170            | 10,996            |
| Luce                             | 14,122         | 3,842               | 2,385              | 3,936             | 3,959             | 58,552         | 18,110              | 10,975             | 14,328            | 15,139            |
| Mackinac                         | 17,046         | 2,855               | 5,116              | 5,293             | 3,782             | 65,205         | 14,175              | 21,672             | 18,144            | 11,214            |
| Menominee                        | 19,560         | 1,623               | 7,374              | 6,394             | 4,169             | 53,636         | 7,120               | 18,908             | 15,124            | 12,484            |
| Schoolcraft                      | 17,600         | 4,638               | 5,034              | 4,802             | 3,126             | 60,834         | 19,879              | 15,191             | 15,220            | 10,544            |
| Total                            | 131,848        | 25,379              | 37,858             | 38,913            | 29,698            | 486,036        | 111,913             | 130,591            | 125,120           | 98,412            |
| Western Upper Peninsula          |                |                     |                    |                   |                   |                |                     |                    |                   |                   |
| Baraga                           | 16,583         | 896                 | 3,541              | 4,390             | 7,756             | 65,259         | 4,220               | 16,224             | 18,367            | 26,448            |
| Dickinson                        | 15,053         | 1,364               | 3,715              | 6,184             | 3,790             | 55,520         | 6,798               | 15,700             | 23,050            | 9,972             |
| Gogebic                          | 22,246         | 1,633               | 4,368              | 6,637             | 9,608             | 79,429         | 6,561               | 24,240             | 24,595            | 24,033            |
| Houghton                         | 21,061         | 1,616               | 3,637              | 6,624             | 9,184             | 80,839         | 8,949               | 18,569             | 24,336            | 28,985            |
| Iron                             | 21,850         | 2,073               | 4,223              | 6,847             | 8,707             | 86,179         | 8,703               | 19,824             | 30,773            | 26,879            |
| Keweenaw                         | 5,746          | 640                 | 1,379              | 1,617             | 2,110             | 23,321         | 3,438               | 6,294              | 5,706             | 7,883             |
| Marquette                        | 37,826         | 5,630               | 8,921              | 13,582            | 9,693             | 136,146        | 26,447              | 34,723             | 43,684            | 31,292            |
| Ontonagon                        | 25,832         | 1,678               | 4,638              | 10,144            | 9,372             | 95,231         | 7,119               | 24,019             | 39,301            | 24,792            |
| Total                            | 166,197        | 15,530              | 34,422             | 56,025            | 60,220            | 621,924        | 72,235              | 159,593            | 209,812           | 180,284           |

(Table 20 continued on next page)

(Table 20 continued on next page)

(Table 20 continued)

| Forest Survey<br>Unit and county | Growing stock  |                                                 |                    |                   | Sawtimber      |                                                 |                    |                   |
|----------------------------------|----------------|-------------------------------------------------|--------------------|-------------------|----------------|-------------------------------------------------|--------------------|-------------------|
|                                  | All<br>species | Major species group<br>(in thousand cubic feet) |                    |                   | All<br>species | Major species group<br>(in thousand board feet) |                    |                   |
|                                  |                | Pine                                            | Other<br>softwoods | Soft<br>hardwoods |                | Pine                                            | Other<br>softwoods | Soft<br>hardwoods |
| Northern Lower Peninsula         |                |                                                 |                    |                   |                |                                                 |                    |                   |
| Alcona                           | 13,059         | 2,887                                           | 1,091              | 5,070             | 53,502         | 9,024                                           | 3,962              | 21,857            |
| Alpena                           | 8,793          | 1,037                                           | 2,631              | 4,020             | 27,192         | 3,953                                           | 6,253              | 13,108            |
| Antrim                           | 10,413         | 963                                             | 748                | 4,389             | 31,438         | 2,868                                           | 3,106              | 14,892            |
| Arenac                           | 4,684          | 352                                             | 237                | 3,122             | 18,850         | 2,233                                           | 704                | 11,338            |
| Bay                              | 2,021          | -                                               | -                  | 1,569             | 9,215          | -                                               | -                  | 7,524             |
| Benzle                           | 7,783          | 2,332                                           | 371                | 2,332             | 24,978         | 5,966                                           | 818                | 8,461             |
| Charlevoix                       | 8,870          | 817                                             | 2,051              | 2,172             | 33,631         | 4,375                                           | 5,891              | 10,819            |
| Cheboygan                        | 13,593         | 2,892                                           | 1,706              | 5,099             | 41,475         | 9,499                                           | 5,398              | 16,828            |
| Clare                            | 10,111         | 2,019                                           | 85                 | 5,830             | 35,154         | 7,513                                           | 788                | 16,157            |
| Crawford                         | 8,700          | 2,936                                           | 357                | 2,252             | 32,323         | 13,963                                          | 1,432              | 5,628             |
| Emmet                            | 10,718         | 1,320                                           | 598                | 3,631             | 38,291         | 6,566                                           | 1,726              | 14,055            |
| Gladwin                          | 7,362          | 943                                             | 82                 | 5,234             | 24,275         | 2,602                                           | 375                | 16,899            |
| Grand Traverse                   | 8,823          | 4,699                                           | 543                | 1,512             | 22,809         | 7,266                                           | 2,312              | 5,540             |
| Iosco                            | 8,836          | 3,185                                           | 990                | 3,302             | 36,899         | 14,426                                          | 3,173              | 13,765            |
| Isabella                         | 4,926          | 273                                             | 150                | 2,895             | 19,919         | 648                                             | 674                | 11,643            |
| Kalkaska                         | 12,977         | 5,590                                           | 694                | 3,172             | 34,863         | 11,767                                          | 3,176              | 10,415            |
| Lake                             | 13,529         | 4,932                                           | 564                | 3,032             | 52,344         | 17,764                                          | 1,670              | 11,055            |
| Leelanau                         | 5,718          | 1,499                                           | 295                | 1,121             | 19,701         | 4,315                                           | 1,014              | 3,213             |
| Manistee                         | 11,185         | 3,418                                           | 314                | 3,549             | 37,914         | 9,834                                           | 1,145              | 12,035            |
| Mason                            | 8,196          | 3,038                                           | 112                | 3,110             | 30,615         | 8,721                                           | 414                | 11,573            |
| Mecosta                          | 8,307          | 1,286                                           | 647                | 4,497             | 23,908         | 4,669                                           | 2,136              | 12,025            |
| Midland                          | 7,467          | 442                                             | 107                | 5,217             | 27,728         | 2,032                                           | 646                | 19,527            |
| Missaukee                        | 11,808         | 2,705                                           | 1,343              | 5,453             | 30,441         | 7,099                                           | 4,099              | 12,399            |
| Montmorency                      | 10,502         | 2,197                                           | 549                | 4,596             | 34,439         | 8,371                                           | 1,747              | 12,155            |
| Newaygo                          | 15,606         | 4,464                                           | 205                | 5,371             | 61,067         | 15,205                                          | 1,829              | 18,918            |
| Oceana                           | 7,810          | 1,622                                           | 411                | 3,183             | 26,458         | 6,230                                           | 1,515              | 7,744             |
| Ogemaw                           | 10,016         | 2,560                                           | 662                | 4,467             | 28,499         | 3,305                                           | 1,686              | 15,253            |
| Osceola                          | 7,635          | 1,263                                           | 579                | 3,746             | 24,409         | 3,787                                           | 2,884              | 9,463             |
| Oscoda                           | 10,442         | 4,280                                           | 659                | 2,846             | 36,290         | 14,044                                          | 1,293              | 8,807             |
| Oshtemo                          | 11,390         | 2,348                                           | 959                | 3,270             | 33,205         | 6,438                                           | 1,937              | 10,815            |
| Presque Isle                     | 9,922          | 1,576                                           | 2,765              | 3,802             | 32,111         | 7,132                                           | 8,078              | 12,169            |
| Roscommon                        | 8,091          | 1,227                                           | 1,311              | 2,879             | 35,703         | 6,364                                           | 3,621              | 11,292            |
| Wexford                          | 15,053         | 6,458                                           | 1,067              | 3,606             | 41,732         | 16,391                                          | 3,291              | 9,815             |
| Total                            | 314,346        | 77,560                                          | 24,883             | 119,346           | 1,061,378      | 244,370                                         | 78,793             | 397,187           |

(Table 20 continued on next page)

(Table 20 continued)

| Forest Survey<br>Unit and county      | Growing stock  |                     |                    |                   |                   | Sawtimber      |                     |                    |                   |                   |
|---------------------------------------|----------------|---------------------|--------------------|-------------------|-------------------|----------------|---------------------|--------------------|-------------------|-------------------|
|                                       | All<br>species | Major species group |                    |                   |                   | All<br>species | Major species group |                    |                   |                   |
|                                       |                | Pine                | Other<br>softwoods | Soft<br>hardwoods | Hard<br>hardwoods |                | Pine                | Other<br>softwoods | Soft<br>hardwoods | Hard<br>hardwoods |
|                                       |                |                     |                    |                   |                   |                |                     |                    |                   |                   |
| (in thousand cubic feet)              |                |                     |                    |                   |                   |                |                     |                    |                   |                   |
| (in thousand board feet) <sup>1</sup> |                |                     |                    |                   |                   |                |                     |                    |                   |                   |
| Southern Lower Peninsula              |                |                     |                    |                   |                   |                |                     |                    |                   |                   |
| Allegan                               | 9,057          | 812                 | 34                 | 3,591             | 4,620             | 34,946         | 4,188               | 110                | 12,872            | 17,776            |
| Barry                                 | 5,860          | 340                 | 245                | 2,381             | 2,894             | 23,728         | 1,759               | 791                | 6,963             | 14,215            |
| Berrien                               | 4,683          | 290                 | 12                 | 2,520             | 1,861             | 18,462         | 650                 | 77                 | 9,335             | 8,400             |
| Branch                                | 2,510          | 17                  | 1                  | 1,635             | 857               | 9,601          | -                   | 5                  | 6,755             | 2,841             |
| Calhoun                               | 5,805          | 143                 | -                  | 3,624             | 2,038             | 21,138         | 688                 | -                  | 12,529            | 7,921             |
| Cass                                  | 3,338          | -10                 | 10                 | 1,577             | 1,761             | 12,779         | 251                 | 57                 | 5,715             | 6,756             |
| Clinton                               | 2,068          | -                   | -                  | 1,433             | 635               | 7,152          | -                   | -                  | 6,020             | 1,132             |
| Eaton                                 | 4,794          | 50                  | -                  | 2,331             | 2,413             | 13,770         | 218                 | -                  | 6,413             | 7,139             |
| Genesee                               | 2,658          | -                   | -                  | 1,259             | 1,399             | 9,071          | -                   | -                  | 3,338             | 5,733             |
| Graiot                                | 2,511          | 134                 | -                  | 1,229             | 1,148             | 10,065         | 359                 | -                  | 5,097             | 4,609             |
| Hillsdale                             | 4,401          | 741                 | 8                  | 1,507             | 2,145             | 15,108         | 3,896               | -                  | 3,718             | 7,494             |
| Huron                                 | 3,044          | -                   | 55                 | 2,217             | 772               | 11,829         | -                   | -                  | 8,737             | 3,092             |
| Ingham                                | 3,152          | 52                  | 53                 | 1,690             | 1,357             | 11,567         | 116                 | 374                | 5,636             | 5,441             |
| Ionia                                 | 3,926          | 133                 | 367                | 1,887             | 1,539             | 10,728         | 845                 | 241                | 3,501             | 6,141             |
| Jackson                               | 3,737          | 152                 | 36                 | 1,372             | 2,177             | 14,500         | 434                 | -                  | 3,852             | 10,214            |
| Kalamazoo                             | 4,130          | 606                 | 86                 | 2,078             | 1,360             | 12,033         | 2,633               | 254                | 5,934             | 3,212             |
| Kent                                  | 7,561          | 678                 | 51                 | 2,936             | 3,896             | 27,008         | 3,286               | -                  | 8,703             | 15,019            |
| Lapeer                                | 5,922          | 971                 | 588                | 2,716             | 1,647             | 18,811         | 2,449               | 1,019              | 8,906             | 6,437             |
| Lenawee                               | 2,840          | -                   | 22                 | 1,505             | 1,313             | 9,498          | -                   | 22                 | 4,121             | 5,355             |
| Livingston                            | 4,884          | 497                 | -                  | 2,148             | 2,239             | 17,880         | 2,488               | -                  | 6,680             | 8,712             |
| Macomb                                | 1,968          | -                   | 92                 | 1,106             | 770               | 5,096          | -                   | 115                | 2,776             | 2,205             |
| Monroe                                | 2,045          | -                   | -                  | 677               | 1,368             | 7,041          | -                   | -                  | 2,713             | 4,328             |
| Montcalm                              | 6,482          | 974                 | -15                | 2,780             | 2,743             | 23,282         | 4,649               | 513                | 7,731             | 10,389            |
| Muskegon                              | 6,874          | 1,666               | 102                | 2,133             | 2,973             | 27,224         | 6,835               | 880                | 6,902             | 12,607            |
| Oakland                               | 4,733          | 74                  | 73                 | 2,362             | 2,224             | 13,673         | 390                 | -                  | 4,701             | 8,582             |
| Ottawa                                | 4,085          | 684                 | 54                 | 1,786             | 1,561             | 14,916         | 2,473               | 282                | 4,589             | 7,572             |
| Saginaw                               | 3,986          | 357                 | -                  | 1,998             | 1,631             | 11,662         | 1,441               | -                  | 4,947             | 5,274             |
| St. Clair                             | 5,060          | 227                 | 47                 | 1,876             | 2,910             | 17,310         | 1,339               | 169                | 6,182             | 9,620             |
| St. Joseph                            | 3,227          | 70                  | 254                | 1,428             | 1,475             | 11,785         | 261                 | 395                | 4,163             | 6,966             |
| Sanilac                               | 3,037          | 138                 | 58                 | 1,971             | 870               | 7,495          | 212                 | 480                | 3,610             | 3,193             |
| Shiawassee                            | 3,105          | -                   | -                  | 1,567             | 1,538             | 12,746         | -                   | -                  | 5,426             | 7,320             |
| Tuscola                               | 5,708          | 145                 | 75                 | 3,670             | 1,818             | 14,835         | 173                 | 497                | 9,319             | 4,846             |
| Van Buren                             | 5,505          | 278                 | -                  | 2,831             | 2,396             | 19,654         | 1,673               | -                  | 7,722             | 10,259            |
| Washtenaw                             | 3,321          | -                   | 53                 | 1,210             | 2,058             | 12,832         | -                   | 315                | 3,516             | 9,001             |
| Wayne                                 | 2,007          | -                   | -                  | 1,025             | 982               | 6,625          | -                   | -                  | 2,781             | 3,844             |
| Total                                 | 148,024        | 10,219              | 2,361              | 70,056            | 65,388            | 515,850        | 43,706              | 6,596              | 211,903           | 253,645           |
| All counties                          | 760,415        | 128,688             | 99,524             | 284,340           | 247,863           | 2,665,188      | 472,224             | 375,573            | 944,022           | 873,369           |

<sup>1</sup> International 1/4-inch rule.

Table 21. -- Average annual removals of growing stock and sawlumber on timberland by Forest Survey Unit, county, and major species group, Michigan, 1980-1992

| Forest Survey Unit and county   | Growing stock       |        |                 |                |        | Sawlumber           |        |                 |                |        |
|---------------------------------|---------------------|--------|-----------------|----------------|--------|---------------------|--------|-----------------|----------------|--------|
|                                 | Major species group |        |                 |                |        | Major species group |        |                 |                |        |
|                                 | All species         | Pine   | Other softwoods | Hard hardwoods |        | All species         | Pine   | Other softwoods | Hard hardwoods |        |
| <i>(In thousand cubic feet)</i> |                     |        |                 |                |        |                     |        |                 |                |        |
| <b>Eastern Upper Peninsula</b>  |                     |        |                 |                |        |                     |        |                 |                |        |
| Alger                           | 10,019              | 1,980  | 1,741           | 1,889          | 4,609  | 36,516              | 5,937  | 6,639           | 4,159          | 19,781 |
| Chippewa                        | 8,902               | 1,050  | 3,975           | 2,337          | 1,540  | 20,263              | 2,802  | 7,697           | 3,764          | 6,000  |
| Delta                           | 8,762               | 1,143  | 3,134           | 3,842          | 643    | 20,938              | 1,586  | 9,836           | 7,547          | 1,969  |
| Luce                            | 7,353               | 330    | 1,523           | 1,906          | 3,594  | 27,663              | 1,463  | 4,726           | 4,413          | 17,061 |
| Mackinac                        | 6,551               | 1,776  | 1,480           | 2,213          | 1,082  | 13,280              | 3,940  | 3,075           | 2,950          | 3,315  |
| Menominee                       | 6,863               | 631    | 2,280           | 3,195          | 757    | 13,246              | 2,759  | 4,877           | 4,859          | 751    |
| Schoolcraft                     | 6,512               | 1,385  | 1,827           | 2,494          | 806    | 18,079              | 4,736  | 4,591           | 6,602          | 2,150  |
| Total                           | 54,962              | 8,295  | 15,960          | 17,676         | 13,031 | 149,985             | 23,223 | 41,441          | 34,294         | 51,027 |
| <b>Western Upper Peninsula</b>  |                     |        |                 |                |        |                     |        |                 |                |        |
| Baraga                          | 11,271              | 194    | 2,217           | 3,707          | 5,153  | 44,502              | 851    | 10,490          | 10,427         | 22,734 |
| Dickinson                       | 4,090               | 72     | 821             | 3,166          | 31     | 4,372               | 200    | 1,423           | 2,749          | -      |
| Gogebic                         | 6,590               | 545    | 285             | 3,174          | 2,586  | 21,618              | 2,193  | 1,154           | 9,822          | 8,449  |
| Houghton                        | 7,690               | 429    | 1,108           | 2,709          | 3,444  | 26,578              | 1,027  | 4,188           | 6,331          | 15,032 |
| Iron                            | 15,248              | 1,404  | 3,573           | 7,474          | 2,797  | 47,918              | 7,593  | 10,225          | 19,678         | 10,422 |
| Keweenaw                        | 1,661               | 250    | 83              | 744            | 584    | 5,049               | 1,382  | 143             | 1,072          | 2,452  |
| Marquette                       | 23,905              | 3,717  | 5,467           | 9,052          | 5,669  | 77,512              | 16,597 | 18,332          | 21,057         | 21,526 |
| Orntonagon                      | 12,075              | 86     | 645             | 6,891          | 4,653  | 36,811              | 427    | 2,252           | 16,236         | 17,896 |
| Total                           | 82,530              | 6,697  | 14,199          | 36,717         | 24,917 | 264,360             | 30,270 | 48,207          | 87,372         | 98,511 |
| <b>Northern Lower Peninsula</b> |                     |        |                 |                |        |                     |        |                 |                |        |
| Alcona                          | 4,124               | 447    | 47              | 1,857          | 1,773  | 10,043              | 1,796  | 78              | 4,036          | 4,133  |
| Alpena                          | 4,654               | 65     | 521             | 3,563          | 505    | 9,889               | 368    | 1,723           | 7,118          | 680    |
| Antrim                          | 2,044               | -      | -               | 584            | 1,460  | 5,505               | -      | -               | 1,304          | 4,201  |
| Arenac                          | 1,020               | 21     | 62              | 762            | 175    | 2,111               | -      | -               | 1,700          | 411    |
| Bay                             | 894                 | -      | -               | 807            | 87     | 2,175               | -      | -               | 2,117          | 58     |
| Benzie                          | 3,081               | 19     | 19              | 1,792          | 1,251  | 9,520               | -      | -               | 4,814          | 4,706  |
| Charlevoix                      | 4,314               | 1,495  | 906             | 1,680          | 233    | 11,168              | 4,944  | 1,164           | 4,216          | 844    |
| Cheboygan                       | 2,970               | 212    | 230             | 2,186          | 342    | 4,892               | 854    | 512             | 3,045          | 481    |
| Clare                           | 3,117               | 308    | 50              | 2,661          | 98     | 9,145               | 1,271  | -               | 7,450          | 424    |
| Crawford                        | 3,501               | 545    | -               | 1,342          | 1,614  | 4,913               | 1,697  | -               | 1,903          | 1,313  |
| Emmet                           | 3,997               | 1,319  | 108             | 1,437          | 1,133  | 11,135              | 4,404  | 500             | 4,164          | 2,067  |
| Gladwin                         | 2,932               | 30     | -               | 2,845          | 57     | 7,816               | 48     | -               | 7,509          | 259    |
| Grand Traverse                  | 1,034               | 327    | -               | 359            | 348    | 2,153               | -      | -               | 466            | 1,687  |
| Iosco                           | 2,305               | 674    | 177             | 1,113          | 341    | 6,312               | 1,379  | 497             | 3,730          | 706    |
| Isabella                        | 389                 | -      | 42              | 245            | 102    | 742                 | -      | 226             | 85             | 431    |
| Kalkaska                        | 2,616               | 1,624  | 106             | 631            | 255    | 8,979               | 6,390  | 237             | 1,366          | 986    |
| Lake                            | 5,817               | 1,620  | 13              | 1,879          | 2,305  | 9,824               | 2,086  | -               | 3,522          | 4,216  |
| Leelanau                        | 1,172               | 192    | 136             | 311            | 533    | 4,367               | 1,042  | 320             | 942            | 2,063  |
| Manistee                        | 2,977               | 1,036  | -               | 595            | 1,346  | 7,501               | 2,807  | -               | 1,308          | 3,386  |
| Mason                           | 2,320               | 356    | 234             | 1,433          | 297    | 4,871               | 1,239  | 949             | 1,656          | 1,027  |
| Mecosta                         | 917                 | -      | 19              | 767            | 131    | 2,212               | -      | 98              | 1,872          | 242    |
| Midland                         | 1,475               | -      | -               | 1,440          | 35     | 1,921               | -      | -               | 1,759          | 162    |
| Missaukee                       | 877                 | 204    | -               | 492            | 181    | 2,185               | 82     | -               | 1,369          | 734    |
| Montmorency                     | 3,056               | 1,291  | 54              | 1,269          | 442    | 6,961               | 2,494  | 202             | 2,790          | 1,475  |
| Newaygo                         | 6,771               | 1,060  | -               | 3,251          | 2,460  | 18,037              | 2,727  | -               | 6,326          | 8,984  |
| Oceana                          | 2,507               | 308    | 18              | 1,140          | 1,041  | 8,046               | 768    | 94              | 3,263          | 3,921  |
| Ogemaw                          | 5,077               | 901    | 106             | 2,487          | 1,583  | 11,016              | 1,466  | -               | 5,733          | 3,817  |
| Osceola                         | 4,026               | 240    | -               | 3,605          | 181    | 9,077               | -      | -               | 8,634          | 443    |
| Oscoda                          | 4,811               | 2,850  | 128             | 835            | 998    | 9,008               | 4,353  | 160             | 1,692          | 2,803  |
| Oshtemo                         | 4,643               | 834    | 13              | 1,825          | 1,971  | 11,714              | 2,145  | 67              | 2,837          | 6,665  |
| Presque Isle                    | 4,490               | 131    | 2,122           | 2,179          | 58     | 9,705               | 730    | 3,714           | 5,261          | -      |
| Roscommon                       | 3,147               | 1,120  | 272             | 1,271          | 484    | 8,274               | 4,196  | 275             | 2,690          | 1,113  |
| Wexford                         | 4,843               | 1,828  | 6               | 2,261          | 748    | 8,525               | 2,664  | -               | 3,992          | 1,869  |
| Total                           | 101,918             | 21,057 | 5,389           | 50,904         | 24,568 | 239,742             | 51,950 | 10,816          | 110,669        | 66,307 |

(Table 21 continued on next page)

(Table 21 continued)

| Forest Survey<br>Unit and county | Growing stock       |                                  |                    |                   |                   | Sawtimber           |                                               |                    |                   |                   |
|----------------------------------|---------------------|----------------------------------|--------------------|-------------------|-------------------|---------------------|-----------------------------------------------|--------------------|-------------------|-------------------|
|                                  | Major species group |                                  |                    |                   |                   | Major species group |                                               |                    |                   |                   |
|                                  | All<br>species      | Pine<br>(in thousand cubic feet) | Other<br>softwoods | Soft<br>hardwoods | Hard<br>hardwoods | All<br>species      | Pine<br>(in thousand board feet) <sup>1</sup> | Other<br>softwoods | Soft<br>hardwoods | Hard<br>hardwoods |
| Southern Lower Peninsula         |                     |                                  |                    |                   |                   |                     |                                               |                    |                   |                   |
| Allegan                          | 2,377               | 1,482                            | -                  | 323               | 572               | 9,598               | 6,547                                         | -                  | 1,265             | 1,786             |
| Barry                            | 2,061               | 71                               | -                  | 226               | 1,764             | 8,761               | 393                                           | -                  | 579               | 7,789             |
| Berrien                          | 258                 | -                                | -                  | 258               | -                 | 1,318               | -                                             | -                  | 1,318             | -                 |
| Branch                           | 306                 | -                                | -                  | 306               | -                 | 812                 | -                                             | -                  | 812               | -                 |
| Calhoun                          | 537                 | -                                | -                  | 478               | 59                | 1,912               | -                                             | -                  | 1,912             | -                 |
| Cass                             | 181                 | -                                | -                  | 181               | -                 | 203                 | -                                             | -                  | 203               | -                 |
| Clinton                          | -                   | -                                | -                  | -                 | -                 | -                   | -                                             | -                  | -                 | -                 |
| Eaton                            | 1,103               | -                                | -                  | 552               | 551               | 3,448               | -                                             | -                  | 1,437             | 2,011             |
| Genesee                          | 410                 | -                                | -                  | 141               | 269               | 1,575               | -                                             | -                  | 513               | 1,062             |
| Gratiot                          | 1,164               | -                                | -                  | 772               | 392               | 5,230               | -                                             | -                  | 3,721             | 1,509             |
| Hillsdale                        | 67                  | -                                | -                  | 32                | 35                | 181                 | -                                             | -                  | -                 | 181               |
| Huron                            | 581                 | -                                | -                  | 511               | 70                | 1,455               | -                                             | -                  | 1,455             | -                 |
| Ingham                           | 1,161               | -                                | -                  | 650               | 511               | 4,474               | -                                             | -                  | 2,231             | 2,243             |
| Ionia                            | 283                 | -                                | -                  | 152               | 131               | 1,231               | -                                             | -                  | 803               | 428               |
| Jackson                          | 627                 | -                                | -                  | 55                | 572               | 3,116               | -                                             | -                  | 277               | 2,839             |
| Kalamazoo                        | 238                 | -                                | -                  | -                 | 238               | 1,107               | -                                             | -                  | -                 | 1,107             |
| Kent                             | 1,520               | -                                | -                  | 235               | 1,285             | 5,033               | -                                             | -                  | 203               | 4,830             |
| Lapeer                           | 988                 | -                                | -                  | 592               | 396               | 2,811               | -                                             | -                  | 1,899             | 912               |
| Lenawee                          | 245                 | -                                | -                  | 83                | 162               | 1,152               | -                                             | -                  | 401               | 751               |
| Livingston                       | 1,698               | -                                | -                  | 667               | 1,031             | 5,553               | -                                             | -                  | 2,023             | 3,530             |
| Macomb                           | 293                 | -                                | -                  | 293               | -                 | 994                 | -                                             | -                  | 994               | -                 |
| Monroe                           | 509                 | -                                | -                  | 419               | 90                | 2,400               | -                                             | -                  | 1,971             | 429               |
| Montcalm                         | 3,898               | 74                               | 22                 | 1,880             | 1,922             | 12,165              | 398                                           | -                  | 5,690             | 6,077             |
| Muskegon                         | 3,680               | 2,429                            | -                  | 676               | 575               | 12,072              | 8,368                                         | -                  | 1,505             | 2,199             |
| Oakland                          | 532                 | -                                | -                  | 239               | 293               | 1,741               | -                                             | -                  | 581               | 1,160             |
| Ottawa                           | 2,243               | 430                              | 30                 | 570               | 1,213             | 7,620               | 1,108                                         | 79                 | 2,102             | 4,331             |
| Saginaw                          | 563                 | -                                | -                  | 329               | 234               | 506                 | -                                             | -                  | 506               | -                 |
| St. Clair                        | 476                 | -                                | -                  | 50                | 426               | 1,953               | -                                             | -                  | 214               | 1,739             |
| St. Joseph                       | 624                 | -                                | -                  | 45                | 579               | 2,797               | -                                             | -                  | 219               | 2,578             |
| Sanilac                          | -                   | -                                | -                  | -                 | -                 | -                   | -                                             | -                  | -                 | -                 |
| Shiawassee                       | 2,120               | -                                | -                  | 575               | 1,545             | 9,248               | -                                             | -                  | 2,479             | 6,769             |
| Tuscola                          | 2,063               | -                                | -                  | 1,110             | 953               | 5,259               | -                                             | -                  | 1,977             | 3,282             |
| Van Buren                        | 487                 | -                                | -                  | 228               | 259               | 2,057               | -                                             | -                  | 768               | 1,289             |
| Washtenaw                        | 1,097               | -                                | -                  | 454               | 643               | 2,797               | -                                             | -                  | 606               | 2,191             |
| Wayne                            | 516                 | -                                | -                  | 142               | 374               | 1,855               | -                                             | -                  | 541               | 1,314             |
| Total                            | 34,906              | 4,486                            | 52                 | 13,224            | 17,144            | 122,434             | 16,814                                        | 79                 | 41,205            | 64,336            |
| All counties                     | 274,316             | 40,535                           | 35,600             | 118,521           | 79,660            | 776,521             | 122,257                                       | 100,543            | 273,540           | 280,181           |

<sup>1</sup>International 1/4-inch rule.

Table 22. -- Average net annual growth and average annual removals of growing stock and sawtimber on timberland by species group, Michigan, 1980-1992

| Species group        | Growing stock            |                | Sawtimber                             |                |
|----------------------|--------------------------|----------------|---------------------------------------|----------------|
|                      | Average net              | Average annual | Average net                           | Average annual |
|                      | annual growth            | removals       | annual growth                         | removals       |
|                      | (In thousand cubic feet) |                | (In thousand board feet) <sup>1</sup> |                |
| Softwoods            |                          |                |                                       |                |
| Jack pine            | 12,211                   | 13,276         | 55,552                                | 28,863         |
| Red pine             | 78,310                   | 15,980         | 242,699                               | 43,445         |
| White pine           | 32,518                   | 10,283         | 157,432                               | 48,878         |
| White spruce         | 19,649                   | 6,037          | 80,833                                | 23,813         |
| Black spruce         | 3,410                    | 3,566          | 5,797                                 | 5,702          |
| Balsam fir           | 12,484                   | 9,284          | 46,338                                | 18,380         |
| Hemlock              | 12,256                   | 4,426          | 70,789                                | 21,981         |
| Tamarack             | 4,481                    | 288            | 16,116                                | 827            |
| Eastern redcedar     | 230                      | -              | 409                                   | -              |
| Northern white-cedar | 46,202                   | 11,999         | 154,262                               | 29,840         |
| Other softwoods      | 6,461                    | 996            | 17,570                                | 1,071          |
| Total softwoods      | 228,212                  | 76,135         | 847,797                               | 222,800        |
| Hardwoods            |                          |                |                                       |                |
| Select white oak     | 18,733                   | 6,002          | 82,414                                | 17,442         |
| Other white oak      | 25                       | -              | -                                     | -              |
| Select red oak       | 44,236                   | 17,249         | 209,222                               | 56,421         |
| Other red oak        | 10,180                   | 3,806          | 44,620                                | 13,332         |
| Select hickory       | 1,965                    | 324            | 7,286                                 | 1,032          |
| Other hickory        | 1,691                    | 464            | 6,708                                 | 2,058          |
| Basswood             | 20,084                   | 5,903          | 88,004                                | 21,742         |
| Beech                | 13,694                   | 5,660          | 54,064                                | 23,163         |
| Yellow birch         | 4,448                    | 5,271          | 18,897                                | 22,882         |
| Hard maple           | 113,964                  | 34,553         | 325,416                               | 127,649        |
| Soft maple           | 108,225                  | 25,883         | 313,574                               | 60,633         |
| Elm                  | 7,415                    | 2,614          | 11,101                                | 5,249          |
| Black ash            | 8,383                    | 2,252          | 13,625                                | 3,623          |
| White & green ash    | 33,068                   | 5,536          | 110,735                               | 15,328         |
| Sycamore             | 456                      | 133            | 2,735                                 | 732            |
| Cottonwood           | 5,224                    | 1,209          | 24,403                                | 5,459          |
| Willow               | 773                      | 264            | 3,906                                 | 700            |
| Hackberry            | 173                      | -              | 301                                   | -              |
| Balsam poplar        | 6,181                    | 3,054          | 21,811                                | 9,112          |
| Bigtooth aspen       | 40,817                   | 26,186         | 162,687                               | 62,897         |
| Quaking aspen        | 57,148                   | 34,166         | 207,715                               | 76,560         |
| Paper birch          | 13,196                   | 13,076         | 41,988                                | 17,102         |
| Tupelo               | 293                      | 33             | 713                                   | 78             |
| Black cherry         | 14,445                   | 3,523          | 44,469                                | 8,546          |
| Black walnut         | 1,758                    | 76             | 6,549                                 | 387            |
| Butternut            | 195                      | -              | 954                                   | -              |
| Yellow-poplar        | 1,332                    | 225            | 6,036                                 | 1,107          |
| Sassafras            | 2,191                    | 528            | 4,451                                 | 373            |
| Other hardwoods      | 1,910                    | 191            | 3,007                                 | 114            |
| Total hardwoods      | 532,203                  | 198,181        | 1,817,391                             | 553,721        |
| All species          | 760,415                  | 274,316        | 2,665,188                             | 776,521        |

<sup>1</sup>International 1/4-inch rule.

Table 23. -- Average annual mortality of growing stock and sawtimber  
on timberland by species group, Michigan, 1980-1992

| Species group          | Growing stock<br>average annual mortality<br>(In thousand cubic feet) | Sawtimber<br>average annual mortality<br>(In thousand board feet) <sup>1</sup> |
|------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------------------|
| <b>Softwoods</b>       |                                                                       |                                                                                |
| Jack pine              | 11,201                                                                | 23,515                                                                         |
| Red pine               | 577                                                                   | 1,809                                                                          |
| White pine             | 2,229                                                                 | 9,403                                                                          |
| White spruce           | 5,302                                                                 | 20,782                                                                         |
| Black spruce           | 7,841                                                                 | 12,537                                                                         |
| Balsam fir             | 26,038                                                                | 45,547                                                                         |
| Hemlock                | 2,558                                                                 | 12,073                                                                         |
| Tamarack               | 1,710                                                                 | 3,985                                                                          |
| Eastern redcedar       | 1                                                                     | 8                                                                              |
| Northern white-cedar   | 4,356                                                                 | 13,365                                                                         |
| Other softwoods        | 432                                                                   | 112                                                                            |
| <b>Total softwoods</b> | <b>62,245</b>                                                         | <b>143,136</b>                                                                 |
| <b>Hardwoods</b>       |                                                                       |                                                                                |
| Select white oak       | 984                                                                   | 3,166                                                                          |
| Select red oak         | 6,664                                                                 | 13,412                                                                         |
| Other red oak          | 1,879                                                                 | 4,445                                                                          |
| Select hickory         | 444                                                                   | 1,376                                                                          |
| Other hickory          | 290                                                                   | 799                                                                            |
| Basswood               | 4,053                                                                 | 11,289                                                                         |
| Beech                  | 856                                                                   | 2,883                                                                          |
| Yellow birch           | 6,860                                                                 | 22,260                                                                         |
| Hard maple             | 8,868                                                                 | 21,450                                                                         |
| Soft maple             | 10,789                                                                | 23,506                                                                         |
| Elm                    | 14,286                                                                | 28,641                                                                         |
| Black ash              | 3,188                                                                 | 4,549                                                                          |
| White & green ash      | 2,832                                                                 | 5,729                                                                          |
| Sycamore               | 26                                                                    | 44                                                                             |
| Cottonwood             | 350                                                                   | 1,333                                                                          |
| Willow                 | 433                                                                   | 1,331                                                                          |
| Hackberry              | 12                                                                    | 6                                                                              |
| Balsam poplar          | 8,258                                                                 | 23,419                                                                         |
| Bigtooth aspen         | 13,711                                                                | 30,575                                                                         |
| Quaking aspen          | 37,265                                                                | 74,557                                                                         |
| Paper birch            | 11,119                                                                | 14,699                                                                         |
| River birch            | 6                                                                     | 30                                                                             |
| Tupelo                 | 7                                                                     | 7                                                                              |
| Black cherry           | 2,221                                                                 | 1,834                                                                          |
| Black walnut           | 182                                                                   | 740                                                                            |
| Butternut              | 71                                                                    | 174                                                                            |
| Yellow-poplar          | 63                                                                    | 146                                                                            |
| Sassafras              | 370                                                                   | 409                                                                            |
| Other hardwoods        | 161                                                                   | 41                                                                             |
| <b>Total hardwoods</b> | <b>136,248</b>                                                        | <b>292,850</b>                                                                 |
| <b>All species</b>     | <b>198,493</b>                                                        | <b>435,986</b>                                                                 |

<sup>1</sup>International 1/4-inch rule.

Table 24. -- Average net annual growth and average annual removals of growing stock and sawtimber on timberland by ownership class and major species group, Michigan, 1980-1992

| Ownership class      | Average net annual growth of growing stock |                                 |                 |                |                |
|----------------------|--------------------------------------------|---------------------------------|-----------------|----------------|----------------|
|                      | All species                                | Major species group             |                 |                |                |
|                      |                                            | Pine                            | Other softwoods | Soft hardwoods | Hard hardwoods |
|                      |                                            | <i>(In thousand cubic feet)</i> |                 |                |                |
| National forest      | 92,661                                     | 34,126                          | 11,738          | 22,660         | 24,137         |
| Other federal        | 2,158                                      | 584                             | 364             | 661            | 549            |
| State                | 141,963                                    | 34,255                          | 21,045          | 51,262         | 35,401         |
| County and municipal | 11,259                                     | 3,066                           | 833             | 3,478          | 3,882          |
| Indian               | 476                                        | -                               | 100             | 219            | 157            |
| Forest industry      | 52,122                                     | 2,538                           | 12,754          | 14,230         | 22,600         |
| Individual           | 379,665                                    | 44,959                          | 41,127          | 161,911        | 131,668        |
| Corporate            | 80,111                                     | 9,160                           | 11,563          | 29,919         | 29,469         |
| All ownerships       | 760,415                                    | 128,688                         | 99,524          | 284,340        | 247,863        |

| Ownership class      | Average annual removals of growing stock |                                 |                 |                |                |
|----------------------|------------------------------------------|---------------------------------|-----------------|----------------|----------------|
|                      | All species                              | Major species group             |                 |                |                |
|                      |                                          | Pine                            | Other softwoods | Soft hardwoods | Hard hardwoods |
|                      |                                          | <i>(In thousand cubic feet)</i> |                 |                |                |
| National forest      | 40,376                                   | 11,662                          | 6,909           | 13,776         | 8,029          |
| Other federal        | 1,123                                    | 30                              | 602             | 70             | 421            |
| State                | 55,058                                   | 13,910                          | 5,949           | 26,751         | 8,448          |
| County and municipal | 4,090                                    | 1,268                           | 75              | 1,982          | 765            |
| Indian               | -                                        | -                               | -               | -              | -              |
| Forest industry      | 35,464                                   | 2,170                           | 8,218           | 11,475         | 13,601         |
| Individual           | 101,068                                  | 7,959                           | 10,041          | 50,160         | 32,908         |
| Corporate            | 37,137                                   | 3,536                           | 3,806           | 14,307         | 15,488         |
| All ownerships       | 274,316                                  | 40,535                          | 35,600          | 118,521        | 79,660         |

| Ownership class      | Average net annual growth of sawtimber |                                              |                 |                |                |
|----------------------|----------------------------------------|----------------------------------------------|-----------------|----------------|----------------|
|                      | All species                            | Major species group                          |                 |                |                |
|                      |                                        | Pine                                         | Other softwoods | Soft hardwoods | Hard hardwoods |
|                      |                                        | <i>(In thousand board feet) <sup>1</sup></i> |                 |                |                |
| National forest      | 350,351                                | 127,726                                      | 52,891          | 82,241         | 87,493         |
| Other federal        | 8,146                                  | 2,044                                        | 1,617           | 2,417          | 2,068          |
| State                | 479,807                                | 132,922                                      | 76,167          | 158,312        | 112,406        |
| County and municipal | 39,930                                 | 9,517                                        | 3,848           | 12,635         | 13,930         |
| Indian               | 1,605                                  | -                                            | 306             | 601            | 698            |
| Forest industry      | 184,360                                | 11,089                                       | 54,246          | 48,708         | 70,317         |
| Individual           | 1,303,738                              | 153,992                                      | 134,221         | 534,819        | 480,706        |
| Corporate            | 297,251                                | 34,934                                       | 52,277          | 104,289        | 105,751        |
| All ownerships       | 2,665,188                              | 472,224                                      | 375,573         | 944,022        | 873,369        |

| Ownership class      | Average annual removals of sawtimber |                                              |                 |                |                |
|----------------------|--------------------------------------|----------------------------------------------|-----------------|----------------|----------------|
|                      | All species                          | Major species group                          |                 |                |                |
|                      |                                      | Pine                                         | Other softwoods | Soft hardwoods | Hard hardwoods |
|                      |                                      | <i>(In thousand board feet) <sup>1</sup></i> |                 |                |                |
| National forest      | 86,497                               | 22,247                                       | 17,993          | 24,499         | 21,758         |
| Other federal        | 3,991                                | 167                                          | 1,958           | 286            | 1,580          |
| State                | 119,293                              | 41,006                                       | 14,861          | 45,980         | 17,446         |
| County and municipal | 10,044                               | 3,095                                        | 284             | 5,101          | 1,564          |
| Indian               | -                                    | -                                            | -               | -              | -              |
| Forest industry      | 126,529                              | 10,684                                       | 28,430          | 29,424         | 57,991         |
| Individual           | 306,054                              | 30,043                                       | 22,883          | 135,014        | 118,114        |
| Corporate            | 124,113                              | 15,015                                       | 14,134          | 33,236         | 61,728         |
| All ownerships       | 776,521                              | 122,257                                      | 100,543         | 273,540        | 280,181        |

<sup>1</sup>International 1/4-inch rule.

Table 25. -- Average net annual growth and average annual removals of growing stock and sawtimber on timberland by forest type group/local type and major species group, Michigan, 1980-1992

| Forest type group/<br>local type       | Average net annual growth of growing stock |                     |                    |                   |                          | Average annual removals of growing stock |                     |                    |                   |                   |
|----------------------------------------|--------------------------------------------|---------------------|--------------------|-------------------|--------------------------|------------------------------------------|---------------------|--------------------|-------------------|-------------------|
|                                        | All<br>species                             | Major species group |                    |                   |                          | All<br>species                           | Major species group |                    |                   |                   |
|                                        |                                            | Pine                | Other<br>softwoods | Soft<br>hardwoods | Hard<br>hardwoods        |                                          | Pine                | Other<br>softwoods | Soft<br>hardwoods | Hard<br>hardwoods |
|                                        |                                            |                     |                    |                   |                          |                                          |                     |                    |                   |                   |
| (In thousand cubic feet)               |                                            |                     |                    |                   | (In thousand cubic feet) |                                          |                     |                    |                   |                   |
| Softwood type groups                   |                                            |                     |                    |                   |                          |                                          |                     |                    |                   |                   |
| White-red-jack pine                    |                                            |                     |                    |                   |                          |                                          |                     |                    |                   |                   |
| Jack pine                              | 22,785                                     | 18,777              | 876                | 1,919             | 1,213                    | 6,930                                    | 5,841               | 64                 | 703               | 322               |
| Red pine                               | 73,594                                     | 67,521              | 1,032              | 3,057             | 1,984                    | 23,498                                   | 18,250              | 729                | 3,012             | 1,507             |
| White pine                             | 11,962                                     | 9,515               | 332                | 1,365             | 750                      | 3,630                                    | 2,729               | 202                | 457               | 242               |
| Total                                  | 108,341                                    | 95,813              | 2,240              | 6,341             | 3,947                    | 34,058                                   | 26,820              | 995                | 4,172             | 2,071             |
| Spruce-fir                             |                                            |                     |                    |                   |                          |                                          |                     |                    |                   |                   |
| Balsam fir                             | 17,032                                     | 1,768               | 10,336             | 4,479             | 449                      | 6,177                                    | 230                 | 4,566              | 1,338             | 43                |
| White spruce                           | 7,565                                      | 717                 | 5,352              | 1,371             | 125                      | 342                                      | 105                 | 35                 | 179               | 23                |
| Black spruce                           | 9,532                                      | 1,529               | 6,601              | 1,375             | 27                       | 2,026                                    | 410                 | 969                | 647               | -                 |
| Northern white-cedar                   | 32,471                                     | 1,721               | 29,270             | 1,096             | 384                      | 7,691                                    | 260                 | 6,450              | 787               | 194               |
| Tamarack                               | 2,753                                      | 75                  | 2,335              | 323               | 20                       | 453                                      | 23                  | 347                | 83                | -                 |
| Total                                  | 69,353                                     | 5,810               | 53,894             | 8,644             | 1,005                    | 16,689                                   | 1,028               | 12,367             | 3,034             | 260               |
| All softwood types                     | 177,694                                    | 101,623             | 56,134             | 14,985            | 4,952                    | 50,747                                   | 27,848              | 13,362             | 7,206             | 2,331             |
| Hardwood type groups                   |                                            |                     |                    |                   |                          |                                          |                     |                    |                   |                   |
| Oak-hickory                            |                                            |                     |                    |                   |                          |                                          |                     |                    |                   |                   |
| Oak-hickory                            | 79,079                                     | 5,907               | 723                | 18,333            | 54,116                   | 19,426                                   | 1,877               | 14                 | 4,742             | 12,793            |
| Elm-ash-cottonwood                     |                                            |                     |                    |                   |                          |                                          |                     |                    |                   |                   |
| Elm-ash-soft maple                     | 61,290                                     | 851                 | 5,160              | 42,184            | 13,095                   | 12,961                                   | 438                 | 1,183              | 9,954             | 1,386             |
| Maple-beech-birch                      |                                            |                     |                    |                   |                          |                                          |                     |                    |                   |                   |
| Maple-beech-birch                      | 315,925                                    | 12,855              | 21,801             | 117,137           | 164,132                  | 119,529                                  | 5,953               | 9,147              | 48,738            | 55,691            |
| Aspen-birch                            |                                            |                     |                    |                   |                          |                                          |                     |                    |                   |                   |
| Aspen                                  | 109,888                                    | 6,478               | 11,567             | 81,276            | 10,567                   | 68,317                                   | 3,959               | 10,785             | 46,188            | 7,385             |
| Paper birch                            | 10,922                                     | 839                 | 2,572              | 6,604             | 907                      | 1,476                                    | -                   | 439                | 975               | 62                |
| Balsam poplar                          | 5,467                                      | 43                  | 1,521              | 3,809             | 94                       | 1,212                                    | -                   | 497                | 703               | 12                |
| Total                                  | 126,277                                    | 7,360               | 15,660             | 91,689            | 11,568                   | 71,005                                   | 3,959               | 11,721             | 47,866            | 7,459             |
| All hardwood types                     | 582,571                                    | 26,973              | 43,344             | 269,343           | 242,911                  | 222,921                                  | 12,227              | 22,065             | 111,300           | 77,329            |
| Nonstocked                             | 150                                        | 92                  | 46                 | 12                | -                        | 648                                      | 460                 | 173                | 15                | -                 |
| All forest types                       | 760,415                                    | 128,688             | 99,524             | 284,340           | 247,863                  | 274,316                                  | 40,535              | 35,600             | 118,521           | 79,660            |
| Average net annual growth of sawtimber |                                            |                     |                    |                   |                          |                                          |                     |                    |                   |                   |
| Forest type group/<br>local type       | All<br>species                             | Major species group |                    |                   |                          | All<br>species                           | Major species group |                    |                   |                   |
|                                        |                                            | Pine                | Other<br>softwoods | Soft<br>hardwoods | Hard<br>hardwoods        |                                          | Pine                | Other<br>softwoods | Soft<br>hardwoods | Hard<br>hardwoods |
|                                        |                                            |                     |                    |                   |                          |                                          |                     |                    |                   |                   |
|                                        | (In thousand board feet) <sup>1</sup>      |                     |                    |                   |                          | (In thousand board feet) <sup>1</sup>    |                     |                    |                   |                   |
| Softwood type groups                   |                                            |                     |                    |                   |                          |                                          |                     |                    |                   |                   |
| White-red-jack pine                    |                                            |                     |                    |                   |                          |                                          |                     |                    |                   |                   |
| Jack pine                              | 77,507                                     | 68,220              | 1,201              | 3,558             | 4,528                    | 12,604                                   | 11,346              | 59                 | 601               | 598               |
| Red pine                               | 226,704                                    | 206,801             | 4,917              | 7,034             | 7,952                    | 53,044                                   | 43,250              | 2,714              | 4,322             | 2,758             |
| White pine                             | 58,295                                     | 48,218              | 2,630              | 3,512             | 3,935                    | 14,752                                   | 13,104              | 340                | 459               | 849               |
| Total                                  | 362,506                                    | 323,239             | 8,748              | 14,104            | 16,415                   | 80,400                                   | 67,700              | 3,113              | 5,382             | 4,205             |
| Spruce-fir                             |                                            |                     |                    |                   |                          |                                          |                     |                    |                   |                   |
| Balsam fir                             | 61,461                                     | 9,526               | 39,050             | 11,967            | 918                      | 16,240                                   | 1,106               | 12,868             | 2,215             | 51                |
| White spruce                           | 18,702                                     | 3,469               | 11,699             | 3,267             | 267                      | 863                                      | 613                 | 140                | 61                | 49                |
| Black spruce                           | 25,662                                     | 7,025               | 16,801             | 1,870             | -34                      | 6,215                                    | 1,895               | 2,913              | 1,407             | -                 |
| Northern white-cedar                   | 110,452                                    | 9,646               | 92,229             | 7,403             | 1,174                    | 18,108                                   | 1,336               | 14,490             | 1,433             | 849               |
| Tamarack                               | 8,539                                      | 610                 | 7,455              | 442               | 32                       | 902                                      | 113                 | 638                | 151               | -                 |
| Total                                  | 224,816                                    | 30,276              | 167,234            | 24,949            | 2,357                    | 42,328                                   | 5,063               | 31,049             | 5,267             | 949               |
| All softwood types                     | 587,322                                    | 353,515             | 175,982            | 39,053            | 18,772                   | 122,728                                  | 72,763              | 34,162             | 10,649            | 5,154             |
| Hardwood type groups                   |                                            |                     |                    |                   |                          |                                          |                     |                    |                   |                   |
| Oak-hickory                            |                                            |                     |                    |                   |                          |                                          |                     |                    |                   |                   |
| Oak-hickory                            | 327,425                                    | 22,455              | 1,265              | 58,149            | 245,556                  | 53,617                                   | 4,159               | 70                 | 10,499            | 38,889            |
| Elm-ash-cottonwood                     |                                            |                     |                    |                   |                          |                                          |                     |                    |                   |                   |
| Elm-ash-soft maple                     | 205,626                                    | 5,703               | 22,492             | 137,185           | 40,246                   | 34,649                                   | 2,120               | 2,262              | 25,845            | 4,422             |
| Maple-beech-birch                      |                                            |                     |                    |                   |                          |                                          |                     |                    |                   |                   |
| Maple-beech-birch                      | 1,116,031                                  | 59,436              | 112,661            | 407,852           | 536,082                  | 421,173                                  | 28,587              | 36,661             | 137,542           | 218,383           |
| Aspen-birch                            |                                            |                     |                    |                   |                          |                                          |                     |                    |                   |                   |
| Aspen                                  | 370,156                                    | 26,947              | 45,923             | 267,625           | 29,661                   | 137,760                                  | 13,200              | 25,774             | 85,656            | 13,130            |
| Paper birch                            | 37,340                                     | 3,286               | 9,958              | 21,466            | 2,630                    | 2,173                                    | -                   | 419                | 1,599             | 155               |
| Balsam poplar                          | 20,589                                     | 216                 | 7,259              | 12,692            | 422                      | 2,904                                    | -                   | 1,106              | 1,750             | 48                |
| Total                                  | 428,085                                    | 30,449              | 63,140             | 301,783           | 32,713                   | 142,837                                  | 13,200              | 27,299             | 89,005            | 13,333            |
| All hardwood types                     | 2,077,167                                  | 118,043             | 199,558            | 904,969           | 854,597                  | 652,276                                  | 48,066              | 66,292             | 262,891           | 275,027           |
| Nonstocked                             | 699                                        | 666                 | 33                 | -                 | -                        | 1,517                                    | 1,428               | 89                 | -                 | -                 |
| All forest types                       | 2,665,188                                  | 472,224             | 375,573            | 944,022           | 873,369                  | 776,521                                  | 122,257             | 100,543            | 273,540           | 280,181           |

<sup>1</sup>International 1/4-inch rule.

Table 26. --- All live aboveground tree biomass on timberland by ownership class, major species group, and tree biomass component, Michigan, 1993

(In green tons)

| Ownership class and<br>major species group | All<br>components | Tree biomass component |            |                     |                |           |                        |                |
|--------------------------------------------|-------------------|------------------------|------------|---------------------|----------------|-----------|------------------------|----------------|
|                                            |                   | All live               |            | Growing-stock trees |                |           | Nongrowing-stock trees |                |
|                                            |                   | 1-5 inch trees         | Stumps     | Boles               | Tops and limbs | Stumps    | Boles                  | Tops and limbs |
| National forest                            |                   |                        |            |                     |                |           |                        |                |
| Pine                                       | 33,166,395        | 4,057,053              | 1,697,879  | 23,750,128          | 2,829,215      | 50,618    | 699,250                | 82,252         |
| Other softwoods                            | 31,725,021        | 7,490,759              | 1,617,850  | 15,658,354          | 4,326,066      | 202,683   | 1,936,080              | 493,229        |
| Soft hardwoods                             | 61,722,187        | 8,595,693              | 2,281,452  | 32,339,679          | 9,990,451      | 427,067   | 6,271,615              | 1,816,230      |
| Hard hardwoods                             | 68,959,852        | 5,877,217              | 2,960,162  | 38,150,956          | 12,121,886     | 552,942   | 7,114,945              | 2,181,744      |
| Total                                      | 195,573,455       | 26,020,722             | 8,557,343  | 109,899,117         | 29,267,618     | 1,233,310 | 16,021,890             | 4,573,455      |
| Other federal                              |                   |                        |            |                     |                |           |                        |                |
| Pine                                       | 697,252           | 98,361                 | 36,282     | 481,701             | 57,421         | 1,424     | 19,850                 | 2,213          |
| Other softwoods                            | 553,270           | 92,975                 | 28,169     | 310,221             | 84,990         | 2,439     | 27,339                 | 7,137          |
| Soft hardwoods                             | 1,482,982         | 140,164                | 57,530     | 867,229             | 252,758        | 7,204     | 125,906                | 32,191         |
| Hard hardwoods                             | 1,120,189         | 37,787                 | 50,367     | 664,981             | 210,978        | 8,169     | 114,845                | 33,062         |
| Total                                      | 3,853,693         | 369,287                | 172,348    | 2,324,132           | 606,147        | 19,236    | 287,940                | 74,603         |
| State                                      |                   |                        |            |                     |                |           |                        |                |
| Pine                                       | 35,212,903        | 3,859,747              | 1,734,974  | 25,135,734          | 2,926,029      | 94,527    | 1,308,133              | 153,759        |
| Other softwoods                            | 49,407,879        | 12,395,945             | 2,679,655  | 23,717,139          | 6,800,689      | 328,682   | 2,742,796              | 742,973        |
| Soft hardwoods                             | 104,233,645       | 16,262,831             | 3,920,403  | 55,901,385          | 17,027,775     | 564,770   | 8,165,299              | 2,391,182      |
| Hard hardwoods                             | 79,275,473        | 6,759,179              | 3,579,188  | 45,762,758          | 14,604,029     | 481,432   | 6,224,716              | 1,864,171      |
| Total                                      | 268,129,900       | 39,277,702             | 11,914,220 | 150,517,016         | 41,358,522     | 1,469,411 | 18,440,944             | 5,152,085      |
| County and municipal                       |                   |                        |            |                     |                |           |                        |                |
| Pine                                       | 2,521,375         | 258,567                | 126,476    | 1,814,391           | 226,273        | 5,772     | 79,187                 | 10,709         |
| Other softwoods                            | 2,095,851         | 391,316                | 114,107    | 1,087,475           | 294,787        | 17,107    | 153,042                | 38,017         |
| Soft hardwoods                             | 7,341,616         | 950,807                | 277,135    | 4,019,124           | 1,210,168      | 42,963    | 664,794                | 176,625        |
| Hard hardwoods                             | 8,986,904         | 607,687                | 391,601    | 5,217,101           | 1,620,462      | 63,185    | 839,320                | 247,548        |
| Total                                      | 20,945,746        | 2,208,377              | 909,319    | 12,138,091          | 3,351,690      | 129,027   | 1,736,343              | 472,899        |

(Table 26 continued on next page)

(Table 26 continued)

|                 | All components | Tree biomass component |            |                     |                |           |                        |                |   |
|-----------------|----------------|------------------------|------------|---------------------|----------------|-----------|------------------------|----------------|---|
|                 |                | All live               |            | Growing-stock trees |                |           | Nongrowing-stock trees |                |   |
|                 |                | 1-5 inch trees         | Stumps     | Boles               | Tops and limbs | Stumps    | Boles                  | Tops and limbs |   |
| Indian          |                |                        |            |                     |                |           |                        |                |   |
| Pine            | -              | -                      | -          | -                   | -              | -         | -                      | -              | - |
| Other softwoods | 259,710        | 91,647                 | 11,396     | 122,330             | 31,264         | 217       | 2,351                  | 505            |   |
| Soft hardwoods  | 555,687        | 30,724                 | 25,420     | 342,723             | 106,761        | 2,626     | 36,942                 | 10,491         |   |
| Hard hardwoods  | 687,419        | 51,604                 | 30,436     | 414,989             | 132,055        | 3,949     | 38,901                 | 15,485         |   |
| Total           | 1,502,816      | 173,975                | 67,252     | 880,042             | 270,080        | 6,792     | 78,194                 | 26,481         |   |
| Forest industry |                |                        |            |                     |                |           |                        |                |   |
| Pine            | 2,504,635      | 125,897                | 117,392    | 1,960,230           | 210,230        | 4,835     | 77,649                 | 8,402          |   |
| Other softwoods | 34,655,825     | 6,908,954              | 1,848,241  | 17,763,056          | 4,823,809      | 265,893   | 2,423,839              | 622,033        |   |
| Soft hardwoods  | 38,483,306     | 4,884,741              | 1,485,699  | 20,455,727          | 6,338,995      | 271,572   | 3,902,324              | 1,144,248      |   |
| Hard hardwoods  | 63,386,514     | 6,163,255              | 2,591,706  | 34,473,414          | 10,858,835     | 521,792   | 6,718,479              | 2,059,033      |   |
| Total           | 139,030,280    | 18,082,847             | 6,043,038  | 74,652,427          | 22,231,869     | 1,064,092 | 13,122,291             | 3,833,716      |   |
| Individual      |                |                        |            |                     |                |           |                        |                |   |
| Pine            | 39,111,019     | 4,444,323              | 1,957,844  | 26,717,053          | 3,602,435      | 149,531   | 1,922,652              | 317,181        |   |
| Other softwoods | 78,165,748     | 20,813,252             | 4,068,337  | 37,007,653          | 10,533,923     | 475,439   | 4,146,361              | 1,120,783      |   |
| Soft hardwoods  | 290,971,029    | 31,034,103             | 11,512,510 | 167,463,506         | 50,185,752     | 1,526,617 | 22,785,321             | 6,463,220      |   |
| Hard hardwoods  | 282,298,494    | 23,992,792             | 12,178,382 | 164,101,087         | 50,846,898     | 1,692,746 | 22,772,887             | 6,713,702      |   |
| Total           | 690,546,290    | 80,284,470             | 29,717,073 | 395,289,299         | 115,169,008    | 3,844,333 | 51,627,221             | 14,614,886     |   |
| Corporate       |                |                        |            |                     |                |           |                        |                |   |
| Pine            | 9,867,831      | 844,851                | 470,950    | 7,225,863           | 845,654        | 27,590    | 401,995                | 50,928         |   |
| Other softwoods | 29,047,959     | 6,196,775              | 1,505,141  | 14,801,216          | 4,033,792      | 189,513   | 1,856,502              | 465,020        |   |
| Soft hardwoods  | 64,143,047     | 6,883,790              | 2,515,487  | 36,302,499          | 10,984,850     | 371,813   | 5,523,383              | 1,561,225      |   |
| Hard hardwoods  | 72,303,458     | 6,206,508              | 3,050,224  | 40,886,930          | 12,764,958     | 517,941   | 6,811,597              | 2,065,300      |   |
| Total           | 175,362,295    | 20,131,924             | 7,541,802  | 99,216,508          | 28,629,254     | 1,106,857 | 14,593,477             | 4,142,473      |   |
| All ownerships  |                |                        |            |                     |                |           |                        |                |   |
| Pine            | 123,081,410    | 13,688,799             | 6,141,797  | 87,085,100          | 10,697,257     | 334,297   | 4,508,716              | 625,444        |   |
| Other softwoods | 225,911,263    | 54,381,623             | 11,872,896 | 110,467,444         | 30,929,320     | 1,481,973 | 13,288,310             | 3,489,697      |   |
| Soft hardwoods  | 568,933,499    | 68,782,853             | 22,075,636 | 317,691,872         | 96,097,510     | 3,214,632 | 47,475,584             | 13,595,412     |   |
| Hard hardwoods  | 577,018,303    | 49,696,029             | 24,832,066 | 329,672,216         | 103,160,101    | 3,842,156 | 50,635,690             | 15,180,045     |   |
| Total           | 1,494,944,475  | 186,549,304            | 64,922,395 | 844,916,632         | 240,884,188    | 8,873,058 | 115,908,300            | 32,890,598     |   |

Table 27. -- Area of land by land class, forest type, and Forest Survey Unit, Michigan, 1980 and 1993

(In thousand acres)

| Land class<br>and forest type | All Units |          | Eastern Upper Peninsula |         | Western Upper Peninsula |         | Northern Lower Peninsula |          | Southern Lower Peninsula |          |
|-------------------------------|-----------|----------|-------------------------|---------|-------------------------|---------|--------------------------|----------|--------------------------|----------|
|                               | 1980      | 1993     | 1980                    | 1993    | 1980                    | 1993    | 1980                     | 1993     | 1980                     | 1993     |
| Forest land                   |           |          |                         |         |                         |         |                          |          |                          |          |
| Timberland                    |           |          |                         |         |                         |         |                          |          |                          |          |
| Jack pine                     | 964.2     | 846.1    | 245.3                   | 195.0   | 81.2                    | 87.3    | 594.3                    | 520.6    | 43.4                     | 43.2     |
| Red pine                      | 588.2     | 897.2    | 107.8                   | 158.2   | 58.2                    | 97.8    | 387.3                    | 591.8    | 34.9                     | 49.4     |
| White pine                    | 199.4     | 233.8    | 72.1                    | 68.1    | 42.6                    | 46.2    | 70.1                     | 95.9     | 14.6                     | 23.6     |
| Balsam fir                    | 576.8     | 563.1    | 199.6                   | 232.6   | 320.1                   | 267.9   | 57.1                     | 62.6     | -                        | -        |
| White fir                     | 140.2     | 146.9    | 73.0                    | 62.1    | 52.1                    | 51.2    | 12.5                     | 25.0     | 2.6                      | 8.6      |
| Black spruce                  | 450.3     | 465.1    | 221.1                   | 232.2   | 200.0                   | 208.2   | 29.2                     | 24.7     | -                        | -        |
| Northern white-cedar          | 1,292.6   | 1,349.4  | 655.4                   | 632.9   | 256.2                   | 291.3   | 368.0                    | 419.2    | 13.0                     | 6.0      |
| Tamarack                      | 121.6     | 148.9    | 45.3                    | 54.5    | 39.6                    | 48.4    | 32.3                     | 38.2     | 4.4                      | 7.8      |
| Oak-hickory                   | 1,768.4   | 1,981.8  | 25.9                    | 37.6    | 23.7                    | 29.0    | 1,051.0                  | 1,168.8  | 667.8                    | 746.4    |
| Elm-ash-soft maple            | 1,422.1   | 1,626.9  | 226.6                   | 220.7   | 182.0                   | 189.0   | 462.9                    | 545.9    | 550.6                    | 671.3    |
| Maple-beech-birch             | 6,218.7   | 7,161.3  | 1,150.5                 | 1,264.3 | 2,396.2                 | 2,465.8 | 1,741.4                  | 2,130.3  | 930.6                    | 1,300.9  |
| Aspen                         | 3,082.3   | 2,675.7  | 530.0                   | 460.3   | 690.7                   | 676.6   | 1,680.1                  | 1,415.8  | 181.5                    | 123.0    |
| Paper birch                   | 368.4     | 291.5    | 109.1                   | 79.8    | 127.4                   | 97.9    | 125.3                    | 106.8    | 6.6                      | 7.0      |
| Balsam poplar                 | 193.2     | 189.7    | 103.4                   | 102.3   | 23.3                    | 26.1    | 59.9                     | 54.4     | 6.6                      | 6.9      |
| Nonstocked                    | 86.2      | 38.5     | 25.9                    | 8.3     | 14.7                    | 6.7     | 30.3                     | 16.9     | 15.3                     | 6.6      |
| Subtotal                      | 17,472.6  | 18,615.9 | 3,791.0                 | 3,808.9 | 4,508.0                 | 4,589.4 | 6,701.7                  | 7,216.9  | 2,471.9                  | 3,000.7  |
| Reserved forest land          | 680.9     | 574.7    | 144.8                   | 120.9   | 269.3                   | 229.6   | 182.0                    | 171.2    | 84.8                     | 53.0     |
| Other forest land             | 194.3     | 90.2     | 67.9                    | 46.2    | 42.4                    | 17.5    | 79.0                     | 26.5     | 5.0                      | -        |
| All forest land               | 18,347.8  | 19,280.8 | 4,003.7                 | 3,976.0 | 4,819.7                 | 4,836.5 | 6,962.7                  | 7,414.6  | 2,561.7                  | 3,053.7  |
| Nonforest land                |           |          |                         |         |                         |         |                          |          |                          |          |
| Cropland                      | 11,707.3  | 10,008.3 | 412.6                   | 337.7   | 174.4                   | 158.8   | 2,375.8                  | 1,919.7  | 8,744.5                  | 7,592.1  |
| Pasture                       | 1,320.1   | 1,422.5  | 3.9                     | 47.7    | 141.2                   | 56.2    | 740.6                    | 579.0    | 434.4                    | 739.6    |
| Other land <sup>1</sup>       | 4,749.9   | 5,646.6  | 466.6                   | 627.8   | 289.2                   | 468.4   | 1,221.9                  | 1,431.9  | 2,772.2                  | 3,118.5  |
| All nonforest land            | 17,777.3  | 17,077.4 | 883.1                   | 1,013.2 | 604.8                   | 683.4   | 4,338.3                  | 3,930.6  | 11,951.1                 | 11,450.2 |
| Total land                    | 36,125.1  | 36,358.2 | 4,886.8                 | 4,989.2 | 5,424.5                 | 5,519.9 | 11,301.0                 | 11,345.2 | 14,512.8                 | 14,503.9 |

<sup>1</sup> The 1980 and 1993 totals for all units include 88.8 thousand acres and 183.5 thousand acres, respectively, of water according to FIA standards of area classification, but defined by the Bureau of the Census as land.

Table 28. -- Area of timberland by Forest Survey Unit  
and county, Michigan, 1980 and 1993

(In thousand acres)

| Forest Survey Unit and county   | 1980    | 1993    |
|---------------------------------|---------|---------|
| <b>Eastern Upper Peninsula</b>  |         |         |
| Alger                           | 489.3   | 471.4   |
| Chippewa                        | 703.2   | 707.7   |
| Delta                           | 573.6   | 595.5   |
| Luce                            | 466.7   | 463.4   |
| Mackinac                        | 521.7   | 522.2   |
| Menominee                       | 493.8   | 523.3   |
| Schoolcraft                     | 542.7   | 525.4   |
| Total                           | 3,791.0 | 3,808.9 |
| <b>Western Upper Peninsula</b>  |         |         |
| Baraga                          | 508.0   | 486.7   |
| Dickinson                       | 374.6   | 398.2   |
| Gogebic                         | 616.6   | 608.4   |
| Houghton                        | 509.5   | 528.9   |
| Iron                            | 651.8   | 658.0   |
| Keweenaw                        | 205.0   | 198.5   |
| Marquette                       | 971.4   | 1,005.1 |
| Ontonagon                       | 671.1   | 705.6   |
| Total                           | 4,508.0 | 4,589.4 |
| <b>Northern Lower Peninsula</b> |         |         |
| Alcona                          | 307.7   | 321.9   |
| Alpena                          | 217.9   | 233.0   |
| Antrim                          | 157.5   | 189.7   |
| Arenac                          | 92.7    | 121.1   |
| Bay                             | 17.8    | 43.3    |
| Benzie                          | 119.1   | 136.9   |
| Charlevoix                      | 139.1   | 170.4   |
| Cheboygan                       | 367.5   | 339.6   |
| Clare                           | 216.5   | 245.5   |
| Crawford                        | 272.6   | 290.0   |
| Emmet                           | 195.8   | 197.6   |
| Gladwin                         | 193.4   | 186.9   |
| Grand Traverse                  | 154.5   | 170.9   |
| Iosco                           | 225.1   | 242.6   |
| Isabella                        | 78.6    | 101.6   |
| Kalkaska                        | 253.7   | 267.4   |
| Lake                            | 300.2   | 315.2   |
| Leelanau                        | 76.0    | 88.4    |
| Manistee                        | 225.7   | 249.1   |
| Mason                           | 148.2   | 157.0   |
| Mecosta                         | 120.5   | 163.4   |
| Midland                         | 148.2   | 175.6   |
| Missaukee                       | 205.1   | 229.3   |
| Montmorency                     | 301.1   | 293.6   |
| Newaygo                         | 310.2   | 330.4   |
| Oceana                          | 148.4   | 182.0   |
| Ogemaw                          | 219.7   | 228.5   |
| Osceola                         | 157.2   | 185.6   |
| Oscoda                          | 307.5   | 307.9   |
| Otsego                          | 260.9   | 239.6   |
| Presque Isle                    | 266.5   | 298.8   |
| Roscommon                       | 247.1   | 254.8   |
| Wexford                         | 249.7   | 259.3   |
| Total                           | 6,701.7 | 7,216.9 |

(Table 28 continued on next page)

(Table 28 continued)

| Forest Survey Unit and county | 1980     | 1993     |
|-------------------------------|----------|----------|
| Southern Lower Peninsula      |          |          |
| Allegan                       | 138.1    | 178.4    |
| Barry                         | 111.9    | 111.2    |
| Berrien                       | 66.4     | 67.0     |
| Branch                        | 44.3     | 54.4     |
| Calhoun                       | 76.4     | 110.6    |
| Cass                          | 54.1     | 76.9     |
| Clinton                       | 30.7     | 53.8     |
| Eaton                         | 45.8     | 82.1     |
| Genesee                       | 44.3     | 64.9     |
| Gratiot                       | 27.5     | 49.2     |
| Hillsdale                     | 45.2     | 74.1     |
| Huron                         | 56.2     | 64.5     |
| Ingham                        | 42.3     | 62.0     |
| Ionia                         | 37.2     | 74.6     |
| Jackson                       | 83.8     | 82.3     |
| Kalamazoo                     | 67.0     | 75.0     |
| Kent                          | 123.3    | 155.5    |
| Lapeer                        | 81.2     | 109.4    |
| Lenawee                       | 47.9     | 55.2     |
| Livingston                    | 69.6     | 94.1     |
| Macomb                        | 45.0     | 60.6     |
| Monroe                        | 35.2     | 37.9     |
| Montcalm                      | 144.9    | 133.0    |
| Muskegon                      | 164.4    | 159.9    |
| Oakland                       | 82.3     | 111.2    |
| Ottawa                        | 77.8     | 79.1     |
| Saginaw                       | 82.9     | 98.9     |
| St. Clair                     | 88.1     | 78.3     |
| St. Joseph                    | 60.4     | 65.6     |
| Sanilac                       | 50.2     | 79.9     |
| Shiawassee                    | 53.1     | 50.2     |
| Tuscola                       | 84.0     | 115.5    |
| Van Buren                     | 102.4    | 122.3    |
| Washtenaw                     | 72.2     | 82.2     |
| Wayne                         | 35.8     | 30.9     |
| Total                         | 2,471.9  | 3,000.7  |
| All counties                  | 17,472.6 | 18,615.9 |

Table 29. -- Area of timberland by Forest Survey Unit and  
stand-size class, Michigan, 1980 and 1993

(In thousand acres)

| Forest Survey Unit<br>and stand-size class | 1980     | 1993     |
|--------------------------------------------|----------|----------|
| <b>Eastern Upper Peninsula</b>             |          |          |
| Sawtimber                                  | 1,122.5  | 1,553.4  |
| Poletimber                                 | 1,723.6  | 1,130.0  |
| Sapling & seedling                         | 919.0    | 1,117.2  |
| Nonstocked                                 | 25.9     | 8.3      |
| Total                                      | 3,791.0  | 3,808.9  |
| <b>Western Upper Peninsula</b>             |          |          |
| Sawtimber                                  | 1,830.2  | 2,274.6  |
| Poletimber                                 | 1,934.6  | 1,293.5  |
| Sapling & seedling                         | 728.5    | 1,014.6  |
| Nonstocked                                 | 14.7     | 6.7      |
| Total                                      | 4,508.0  | 4,589.4  |
| <b>Northern Lower Peninsula</b>            |          |          |
| Sawtimber                                  | 1,581.8  | 3,052.8  |
| Poletimber                                 | 3,115.6  | 2,454.7  |
| Sapling & seedling                         | 1,974.0  | 1,692.5  |
| Nonstocked                                 | 30.3     | 16.9     |
| Total                                      | 6,701.7  | 7,216.9  |
| <b>Southern Lower Peninsula</b>            |          |          |
| Sawtimber                                  | 1,001.6  | 1,724.1  |
| Poletimber                                 | 693.4    | 663.1    |
| Sapling & seedling                         | 761.6    | 606.9    |
| Nonstocked                                 | 15.3     | 6.6      |
| Total                                      | 2,471.9  | 3,000.7  |
| <b>All units</b>                           |          |          |
| Sawtimber                                  | 5,536.1  | 8,604.9  |
| Poletimber                                 | 7,467.2  | 5,541.3  |
| Sapling & seedling                         | 4,383.1  | 4,431.2  |
| Nonstocked                                 | 86.2     | 38.5     |
| Total                                      | 17,472.6 | 18,615.9 |

Table 30. -- Area of land by land-use class and Forest Survey Unit, Michigan, 1993

(In thousand acres)

| Land-use class              | All<br>Units | Forest Survey Unit         |                            |                             |                             |
|-----------------------------|--------------|----------------------------|----------------------------|-----------------------------|-----------------------------|
|                             |              | Eastern Upper<br>Peninsula | Western Upper<br>Peninsula | Northern Lower<br>Peninsula | Southern Lower<br>Peninsula |
| Forest land                 |              |                            |                            |                             |                             |
| Timberland                  | 18,615.9     | 3,808.9                    | 4,589.4                    | 7,216.9                     | 3,000.7                     |
| Reserved forest land        | 574.7        | 120.9                      | 229.6                      | 171.2                       | 53.0                        |
| Other forest land           | 90.2         | 46.2                       | 17.5                       | 26.5                        | -                           |
| All forest land             | 19,280.8     | 3,976.0                    | 4,836.5                    | 7,414.6                     | 3,053.7                     |
| Nonforest land              |              |                            |                            |                             |                             |
| Nonforest with trees        |              |                            |                            |                             |                             |
| Cropland with trees         | 54.7         | 4.5                        | 1.9                        | 29.0                        | 19.3                        |
| Improved pasture with trees | 65.5         | 5.9                        | 2.1                        | 24.3                        | 33.2                        |
| Wooded strips               | 131.4        | 9.1                        | 1.1                        | 10.9                        | 110.3                       |
| Idle farmland with trees    | 61.6         | 9.0                        | 6.0                        | 36.8                        | 9.8                         |
| Marsh with trees            | 293.1        | 82.0                       | 32.5                       | 109.9                       | 68.7                        |
| Urban and other with trees  | 946.3        | 50.5                       | 41.7                       | 285.2                       | 568.9                       |
| Windbreaks                  | 40.9         | -                          | -                          | 2.7                         | 38.2                        |
| Wooded pasture              | 2.3          | -                          | -                          | 2.3                         | -                           |
| Total                       | 1,595.8      | 161.0                      | 85.3                       | 501.1                       | 848.4                       |
| Nonforest without trees     |              |                            |                            |                             |                             |
| Cropland                    | 9,953.6      | 333.2                      | 156.9                      | 1,890.7                     | 7,572.8                     |
| Improved pasture            | 1,354.7      | 41.8                       | 54.1                       | 552.4                       | 706.4                       |
| Idle farmland               | 34.4         | 1.3                        | -                          | 16.0                        | 17.1                        |
| Marsh                       | 779.6        | 289.3                      | 115.4                      | 208.6                       | 166.3                       |
| Other farm-farmstead        | 507.5        | 20.9                       | 26.6                       | 160.3                       | 299.7                       |
| Urban and other             | 2,668.3      | 141.9                      | 200.6                      | 561.1                       | 1,764.7                     |
| Noncensus water             | 183.5        | 23.8                       | 44.5                       | 40.4                        | 74.8                        |
| Total                       | 15,481.6     | 852.2                      | 598.1                      | 3,429.5                     | 10,601.8                    |
| All nonforest land          | 17,077.4     | 1,013.2                    | 683.4                      | 3,930.6                     | 11,450.2                    |
| Total land                  | 36,358.2     | 4,989.2                    | 5,519.9                    | 11,345.2                    | 14,503.9                    |
| Census water                | 25,600.7     | 5,870.7                    | 6,809.2                    | 8,317.4                     | 4,603.4                     |
| Total land and water        | 61,958.9     | 10,859.9                   | 12,329.1                   | 19,662.6                    | 19,107.3                    |

Table 31. -- Area of timberland by ownership class, potential productivity class, and Forest Survey Unit, Michigan, 1993

(In thousand acres)

| Forest Survey            |             | Potential productivity class (cubic feet of growth per acre per year) |         |         |         |         |
|--------------------------|-------------|-----------------------------------------------------------------------|---------|---------|---------|---------|
| Unit and ownership class | All classes | 165+                                                                  | 120-164 | 85-119  | 50-84   | 20-49   |
| Eastern Upper Peninsula  |             |                                                                       |         |         |         |         |
| National forest          | 763.9       | -                                                                     | 24.5    | 124.3   | 297.9   | 317.2   |
| Other federal            | 20.5        | -                                                                     | 1.3     | 3.9     | 9.0     | 6.3     |
| State                    | 937.2       | -                                                                     | 18.5    | 111.9   | 318.7   | 488.1   |
| County and municipal     | 12.7        | 1.1                                                                   | -       | 2.9     | 7.0     | 1.7     |
| Indian                   | 8.2         | -                                                                     | -       | 1.3     | 2.6     | 4.3     |
| Forest industry          | 422.4       | -                                                                     | 9.7     | 46.0    | 145.3   | 221.4   |
| Individual               | 1,241.9     | 3.1                                                                   | 45.6    | 188.8   | 503.9   | 500.5   |
| Corporate                | 402.1       | -                                                                     | 9.3     | 37.2    | 148.2   | 207.4   |
| All ownerships           | 3,808.9     | 4.2                                                                   | 108.9   | 516.3   | 1,432.6 | 1,746.9 |
| Western Upper Peninsula  |             |                                                                       |         |         |         |         |
| National forest          | 863.4       | -                                                                     | 70.6    | 167.8   | 427.4   | 197.6   |
| Other federal            | 17.1        | -                                                                     | 1.1     | 4.2     | 9.1     | 2.7     |
| State                    | 616.7       | 2.6                                                                   | 21.4    | 112.4   | 265.4   | 214.9   |
| County and municipal     | 90.0        | -                                                                     | 1.7     | 15.6    | 40.0    | 32.7    |
| Indian                   | 6.4         | -                                                                     | -       | -       | 5.1     | 1.3     |
| Forest industry          | 1,085.7     | -                                                                     | 26.7    | 153.4   | 440.9   | 464.7   |
| Individual               | 1,076.7     | 2.1                                                                   | 32.0    | 192.6   | 538.6   | 311.4   |
| Corporate                | 833.4       | 4.1                                                                   | 33.3    | 149.4   | 381.9   | 264.7   |
| All ownerships           | 4,589.4     | 8.8                                                                   | 186.8   | 795.4   | 2,108.4 | 1,490.0 |
| Northern Lower Peninsula |             |                                                                       |         |         |         |         |
| National forest          | 900.9       | 0.5                                                                   | 56.1    | 210.3   | 352.1   | 281.9   |
| Other federal            | 12.0        | -                                                                     | 2.1     | 1.7     | 4.1     | 4.1     |
| State                    | 1,936.3     | 3.9                                                                   | 60.1    | 380.6   | 812.7   | 679.0   |
| County and municipal     | 68.0        | 5.9                                                                   | 3.9     | 20.9    | 17.6    | 19.7    |
| Forest industry          | 6.2         | -                                                                     | -       | -       | 6.2     | -       |
| Individual               | 3,726.8     | 21.0                                                                  | 189.5   | 1,036.4 | 1,565.2 | 914.7   |
| Corporate                | 566.7       | 3.7                                                                   | 28.1    | 141.0   | 240.2   | 153.7   |
| All ownerships           | 7,216.9     | 35.0                                                                  | 339.8   | 1,790.9 | 2,998.1 | 2,053.1 |
| Southern Lower Peninsula |             |                                                                       |         |         |         |         |
| National forest          | 14.2        | -                                                                     | -       | 4.8     | 7.3     | 2.1     |
| State                    | 238.0       | 3.9                                                                   | 28.8    | 69.2    | 109.2   | 26.9    |
| County and municipal     | 85.6        | -                                                                     | 10.2    | 18.2    | 45.0    | 12.2    |
| Individual               | 2,403.1     | 60.7                                                                  | 151.1   | 1,059.5 | 918.7   | 213.1   |
| Corporate                | 259.8       | 9.7                                                                   | 12.0    | 133.4   | 90.8    | 13.9    |
| All ownerships           | 3,000.7     | 74.3                                                                  | 202.1   | 1,285.1 | 1,171.0 | 268.2   |
| All units                |             |                                                                       |         |         |         |         |
| National forest          | 2,542.4     | 0.5                                                                   | 151.2   | 507.2   | 1,084.7 | 798.8   |
| Other federal            | 49.6        | -                                                                     | 4.5     | 9.8     | 22.2    | 13.1    |
| State                    | 3,728.2     | 10.4                                                                  | 128.8   | 674.1   | 1,506.0 | 1,408.9 |
| County and municipal     | 256.3       | 7.0                                                                   | 15.8    | 57.6    | 109.6   | 66.3    |
| Indian                   | 14.6        | -                                                                     | -       | 1.3     | 7.7     | 5.6     |
| Forest industry          | 1,514.3     | -                                                                     | 36.4    | 199.4   | 592.4   | 686.1   |
| Individual               | 8,448.5     | 86.9                                                                  | 418.2   | 2,477.3 | 3,526.4 | 1,939.7 |
| Corporate                | 2,062.0     | 17.5                                                                  | 82.7    | 461.0   | 861.1   | 639.7   |
| All ownerships           | 18,615.9    | 122.3                                                                 | 837.6   | 4,387.7 | 7,710.1 | 5,558.2 |

Table 32. -- Area of privately<sup>1</sup> owned timberland by ownership class and size of holding, Michigan, 1993

(In thousand acres)

| Ownership class        | All sizes | Size of holding (acres) |       |       |         |         |         |           |             |         |
|------------------------|-----------|-------------------------|-------|-------|---------|---------|---------|-----------|-------------|---------|
|                        |           | 1-4                     | 5-10  | 11-20 | 21-50   | 51-100  | 101-500 | 501-2,500 | 2,501-5,000 | 5,001+  |
| Forest industry        | 1,514.3   | -                       | -     | -     | 1.1     | 1.3     | 11.4    | 14.1      | 7.7         | 1,478.7 |
| Individual             | 8,448.5   | 248.2                   | 470.0 | 891.5 | 2,692.7 | 1,861.3 | 1,880.2 | 337.3     | 28.0        | 39.3    |
| Corporate              | 2,062.0   | 7.2                     | 17.4  | 32.5  | 163.2   | 107.7   | 318.5   | 252.7     | 162.1       | 1,000.7 |
| All private ownerships | 12,024.8  | 255.4                   | 487.4 | 924.0 | 2,857.0 | 1,970.3 | 2,210.1 | 604.1     | 197.8       | 2,518.7 |

<sup>1</sup>Does not include 14.6 thousand acres of Indian owned timberland.

<sup>1</sup>Does not include 14.6 thousand acres of Indian owned timberland.

Table 33. -- Area of timberland by ownership class, stand-volume class (board feet)  
and Forest Survey Unit, Michigan, 1993

(In thousand acres)

| Forest Survey<br>Unit and ownership class | All classes     | Stand-volume class (board feet) <sup>1</sup> |                |                |
|-------------------------------------------|-----------------|----------------------------------------------|----------------|----------------|
|                                           |                 | Less than 1,500                              | 1,500-4,999    | 5,000+         |
| <b>Eastern Upper Peninsula</b>            |                 |                                              |                |                |
| National forest                           | 763.9           | 287.5                                        | 243.7          | 232.7          |
| Other federal                             | 20.5            | 7.2                                          | 6.3            | 7.0            |
| State                                     | 937.2           | 342.2                                        | 332.4          | 262.6          |
| County and municipal                      | 12.7            | 6.0                                          | 5.1            | 1.6            |
| Indian                                    | 8.2             | 4.3                                          | 3.9            | -              |
| Forest industry                           | 422.4           | 154.2                                        | 108.1          | 160.1          |
| Individual                                | 1,241.9         | 448.5                                        | 437.6          | 355.8          |
| Corporate                                 | 402.1           | 127.8                                        | 133.3          | 141.0          |
| <b>All ownerships</b>                     | <b>3,808.9</b>  | <b>1,377.7</b>                               | <b>1,270.4</b> | <b>1,160.8</b> |
| <b>Western Upper Peninsula</b>            |                 |                                              |                |                |
| National forest                           | 863.4           | 221.3                                        | 326.0          | 316.1          |
| Other federal                             | 17.1            | 3.8                                          | 5.1            | 8.2            |
| State                                     | 616.7           | 207.1                                        | 195.3          | 214.3          |
| County and municipal                      | 90.0            | 23.2                                         | 40.2           | 26.6           |
| Indian                                    | 6.4             | -                                            | 1.3            | 5.1            |
| Forest industry                           | 1,085.7         | 248.1                                        | 321.4          | 516.2          |
| Individual                                | 1,076.7         | 303.8                                        | 383.8          | 389.1          |
| Corporate                                 | 833.4           | 198.1                                        | 285.1          | 350.2          |
| <b>All ownerships</b>                     | <b>4,589.4</b>  | <b>1,205.4</b>                               | <b>1,558.2</b> | <b>1,825.8</b> |
| <b>Northern Lower Peninsula</b>           |                 |                                              |                |                |
| National forest                           | 900.9           | 310.9                                        | 363.0          | 227.0          |
| Other federal                             | 12.0            | 4.1                                          | 5.7            | 2.2            |
| State                                     | 1,936.3         | 831.1                                        | 640.9          | 464.3          |
| County and municipal                      | 68.0            | 21.6                                         | 22.7           | 23.7           |
| Forest industry                           | 6.2             | 0.6                                          | -              | 5.6            |
| Individual                                | 3,726.8         | 1,187.0                                      | 1,284.0        | 1,255.8        |
| Corporate                                 | 566.7           | 166.8                                        | 192.8          | 207.1          |
| <b>All ownerships</b>                     | <b>7,216.9</b>  | <b>2,522.1</b>                               | <b>2,509.1</b> | <b>2,185.7</b> |
| <b>Southern Lower Peninsula</b>           |                 |                                              |                |                |
| National forest                           | 14.2            | 5.1                                          | 4.9            | 4.2            |
| State                                     | 238.0           | 54.6                                         | 70.1           | 113.3          |
| County and municipal                      | 85.6            | 29.9                                         | 23.3           | 32.4           |
| Individual                                | 2,403.1         | 767.0                                        | 692.7          | 943.4          |
| Corporate                                 | 259.8           | 82.9                                         | 85.0           | 91.9           |
| <b>All ownerships</b>                     | <b>3,000.7</b>  | <b>939.5</b>                                 | <b>876.0</b>   | <b>1,185.2</b> |
| <b>All units</b>                          |                 |                                              |                |                |
| National forest                           | 2,542.4         | 824.8                                        | 937.6          | 780.0          |
| Other federal                             | 49.6            | 15.1                                         | 17.1           | 17.4           |
| State                                     | 3,728.2         | 1,435.0                                      | 1,238.7        | 1,054.5        |
| County and municipal                      | 256.3           | 80.7                                         | 91.3           | 84.3           |
| Indian                                    | 14.6            | 4.3                                          | 5.2            | 5.1            |
| Forest industry                           | 1,514.3         | 402.9                                        | 429.5          | 681.9          |
| Individual                                | 8,448.5         | 2,706.3                                      | 2,798.1        | 2,944.1        |
| Corporate                                 | 2,062.0         | 575.6                                        | 696.2          | 790.2          |
| <b>All ownerships</b>                     | <b>18,615.9</b> | <b>6,044.7</b>                               | <b>6,213.7</b> | <b>6,357.5</b> |

<sup>1</sup>International 1/4-inch rule.

Table 34. -- Area of timberland by forest type, stand-size class, and ownership class, Michigan, 1993  
(In thousand acres)

| Forest type and stand-size class | All ownerships | Ownership class |               |       |                      |        |       | Forest industry | Individual | Corporate |
|----------------------------------|----------------|-----------------|---------------|-------|----------------------|--------|-------|-----------------|------------|-----------|
|                                  |                | National forest | Other federal | State | County and municipal | Indian |       |                 |            |           |
|                                  |                |                 |               |       |                      |        |       |                 |            |           |
| Jack pine                        |                |                 |               |       |                      |        |       |                 |            |           |
| Sawtimber                        | 258.0          | 40.4            | 7.1           | 114.9 | 6.5                  | -      | 4.2   | 67.5            | 17.4       |           |
| Poetlimber                       | 349.6          | 101.1           | 4.8           | 114.2 | 7.3                  | -      | -     | 106.5           | 15.7       |           |
| Sapling and seedling             | 238.5          | 66.8            | 3.4           | 104.2 | 4.3                  | -      | 3.2   | 36.2            | 20.4       |           |
| All stands                       | 846.1          | 208.3           | 15.3          | 333.3 | 18.1                 | -      | 7.4   | 210.2           | 53.5       |           |
| Red pine                         |                |                 |               |       |                      |        |       |                 |            |           |
| Sawtimber                        | 430.7          | 152.9           | 3.7           | 132.6 | 8.6                  | -      | 4.0   | 109.1           | 19.8       |           |
| Poetlimber                       | 344.0          | 121.7           | -             | 86.9  | 11.1                 | -      | 1.6   | 101.6           | 21.1       |           |
| Sapling and seedling             | 122.5          | 48.2            | -             | 20.1  | -                    | -      | 16.8  | 22.7            | 14.7       |           |
| All stands                       | 897.2          | 322.8           | 3.7           | 239.6 | 19.7                 | -      | 22.4  | 233.4           | 55.6       |           |
| White pine                       |                |                 |               |       |                      |        |       |                 |            |           |
| Sawtimber                        | 173.8          | 35.1            | -             | 40.1  | -                    | -      | 4.7   | 60.7            | 33.2       |           |
| Poetlimber                       | 30.5           | 4.3             | 1.3           | 10.8  | -                    | -      | -     | 14.1            | -          |           |
| Sapling and seedling             | 29.5           | 2.4             | -             | 11.7  | -                    | -      | -     | 13.0            | 2.4        |           |
| All stands                       | 233.8          | 41.8            | 1.3           | 62.6  | -                    | -      | 4.7   | 87.8            | 35.6       |           |
| Balsam fir                       |                |                 |               |       |                      |        |       |                 |            |           |
| Sawtimber                        | 177.3          | 30.0            | 2.6           | 33.2  | 1.3                  | -      | 22.4  | 58.3            | 29.5       |           |
| Poetlimber                       | 158.2          | 30.5            | 2.6           | 19.0  | 3.5                  | -      | 22.0  | 62.8            | 17.8       |           |
| Sapling and seedling             | 227.6          | 30.8            | -             | 60.3  | 1.7                  | -      | 46.8  | 59.0            | 29.0       |           |
| All stands                       | 563.1          | 91.3            | 5.2           | 112.5 | 6.5                  | -      | 91.2  | 180.1           | 76.3       |           |
| White spruce                     |                |                 |               |       |                      |        |       |                 |            |           |
| Sawtimber                        | 47.1           | 8.8             | -             | 10.7  | -                    | -      | 4.8   | 14.0            | 8.8        |           |
| Poetlimber                       | 48.9           | 15.2            | -             | 9.2   | -                    | -      | 1.1   | 15.7            | 7.7        |           |
| Sapling and seedling             | 50.9           | 15.5            | -             | 5.6   | -                    | -      | 4.0   | 21.9            | 3.9        |           |
| All stands                       | 146.9          | 39.5            | -             | 25.5  | -                    | -      | 9.9   | 51.6            | 20.4       |           |
| Black spruce                     |                |                 |               |       |                      |        |       |                 |            |           |
| Sawtimber                        | 49.5           | 17.2            | -             | 12.1  | 1.3                  | -      | 6.9   | 7.6             | 4.4        |           |
| Poetlimber                       | 141.1          | 20.6            | -             | 46.4  | 2.1                  | -      | 17.1  | 42.8            | 12.1       |           |
| Sapling and seedling             | 274.5          | 51.8            | -             | 84.5  | -                    | -      | 42.6  | 68.4            | 27.2       |           |
| All stands                       | 465.1          | 89.6            | -             | 143.0 | 3.4                  | -      | 66.6  | 118.8           | 43.7       |           |
| Northern white-cedar             |                |                 |               |       |                      |        |       |                 |            |           |
| Sawtimber                        | 594.8          | 62.8            | -             | 159.1 | 10.8                 | -      | 116.7 | 186.1           | 59.3       |           |
| Poetlimber                       | 582.2          | 62.2            | -             | 172.5 | 5.8                  | -      | 58.5  | 224.3           | 58.9       |           |
| Sapling and seedling             | 172.4          | 20.0            | -             | 31.3  | -                    | 1.6    | 20.6  | 93.9            | 5.0        |           |
| All stands                       | 1,349.4        | 145.0           | -             | 362.9 | 16.6                 | 1.6    | 195.8 | 504.3           | 123.2      |           |
| Tamarack                         |                |                 |               |       |                      |        |       |                 |            |           |
| Sawtimber                        | 31.5           | -               | -             | 11.0  | 4.3                  | -      | 1.7   | 7.8             | 6.7        |           |
| Poetlimber                       | 40.2           | 1.8             | -             | 12.5  | -                    | -      | 5.0   | 17.6            | 3.3        |           |
| Sapling and seedling             | 77.2           | 17.7            | -             | 17.6  | 0.9                  | -      | 6.6   | 26.2            | 8.2        |           |
| All stands                       | 148.9          | 19.5            | -             | 41.1  | 5.2                  | -      | 13.3  | 51.6            | 18.2       |           |

(Table 34 continued on next page)

(Table 34 continued)

| Forest type and stand-size class | All ownerships | National forest | Other federal | State   | County and municipal | Indian | Forest industry | Individual | Corporate |
|----------------------------------|----------------|-----------------|---------------|---------|----------------------|--------|-----------------|------------|-----------|
| <b>Oak-hickory</b>               |                |                 |               |         |                      |        |                 |            |           |
| Sawtimber                        | 1,230.0        | 108.8           | -             | 233.4   | 17.2                 | -      | 7.6             | 750.3      | 112.7     |
| Poletimber                       | 457.1          | 100.5           | -             | 109.0   | 9.2                  | -      | 0.9             | 204.8      | 32.7      |
| Sapling and seedling             | 294.7          | 62.2            | -             | 79.6    | 6.3                  | -      | 1.3             | 122.0      | 23.3      |
| All stands                       | 1,981.8        | 271.5           | -             | 422.0   | 32.7                 | -      | 9.8             | 1,077.1    | 168.7     |
| <b>Elm-ash-soft maple</b>        |                |                 |               |         |                      |        |                 |            |           |
| Sawtimber                        | 756.5          | 47.9            | -             | 97.6    | 13.5                 | -      | 34.7            | 465.3      | 97.5      |
| Poletimber                       | 469.8          | 45.3            | -             | 68.1    | 4.2                  | 1.8    | 8.5             | 298.1      | 43.8      |
| Sapling and seedling             | 400.6          | 15.3            | -             | 60.7    | 3.7                  | -      | 11.7            | 274.3      | 34.9      |
| All stands                       | 1,626.9        | 108.5           | -             | 226.4   | 21.4                 | 1.8    | 54.9            | 1,037.7    | 176.2     |
| <b>Maple-birch</b>               |                |                 |               |         |                      |        |                 |            |           |
| Sawtimber                        | 3,848.4        | 450.0           | 8.2           | 444.0   | 46.4                 | 3.8    | 590.0           | 1,777.1    | 528.9     |
| Poletimber                       | 1,979.2        | 252.4           | 3.8           | 325.8   | 32.6                 | 5.2    | 182.1           | 939.1      | 238.2     |
| Sapling and seedling             | 1,333.7        | 132.9           | -             | 199.5   | 29.7                 | -      | 96.3            | 708.1      | 167.2     |
| All stands                       | 7,161.3        | 835.3           | 12.0          | 969.3   | 108.7                | 9.0    | 868.4           | 3,424.3    | 934.3     |
| <b>Aspen</b>                     |                |                 |               |         |                      |        |                 |            |           |
| Sawtimber                        | 850.7          | 85.5            | 4.9           | 176.2   | 6.7                  | 1.3    | 20.5            | 445.9      | 109.7     |
| Poletimber                       | 720.6          | 77.8            | 3.0           | 134.2   | 8.5                  | -      | 23.5            | 400.8      | 72.8      |
| Sapling and seedling             | 1,104.4        | 165.9           | 3.2           | 360.8   | 8.0                  | -      | 83.2            | 374.6      | 108.7     |
| All stands                       | 2,675.7        | 329.2           | 11.1          | 671.2   | 23.2                 | 1.3    | 127.2           | 1,221.3    | 291.2     |
| <b>Paper birch</b>               |                |                 |               |         |                      |        |                 |            |           |
| Sawtimber                        | 90.4           | 8.7             | -             | 24.2    | -                    | -      | 12.9            | 28.6       | 16.0      |
| Poletimber                       | 166.8          | 10.5            | 1.0           | 46.3    | -                    | -      | 7.2             | 72.4       | 29.4      |
| Sapling and seedling             | 34.3           | -               | -             | 4.5     | -                    | 0.9    | 4.7             | 19.8       | 4.4       |
| All stands                       | 291.5          | 19.2            | 1.0           | 75.0    | -                    | 0.9    | 24.8            | 120.8      | 49.8      |
| <b>Balsam poplar</b>             |                |                 |               |         |                      |        |                 |            |           |
| Sawtimber                        | 66.2           | 2.6             | -             | 15.8    | -                    | -      | 5.5             | 38.7       | 3.6       |
| Poletimber                       | 53.1           | 6.9             | -             | 6.9     | -                    | -      | 5.4             | 29.7       | 4.2       |
| Sapling and seedling             | 70.4           | 11.4            | -             | 5.2     | -                    | -      | 7.0             | 42.4       | 4.4       |
| All stands                       | 189.7          | 20.9            | -             | 27.9    | -                    | -      | 17.9            | 110.8      | 12.2      |
| <b>Nonstocked</b>                | 38.5           | -               | -             | 15.9    | 0.8                  | -      | -               | 18.7       | 3.1       |
| <b>All forest types</b>          |                |                 |               |         |                      |        |                 |            |           |
| Sawtimber                        | 8,604.9        | 1,050.7         | 26.5          | 1,504.9 | 116.6                | 5.1    | 836.6           | 4,017.0    | 1,047.5   |
| Poletimber                       | 5,541.3        | 850.8           | 16.5          | 1,161.8 | 84.3                 | 7.0    | 332.9           | 2,530.3    | 557.7     |
| Sapling and seedling             | 4,431.2        | 640.9           | 6.6           | 1,045.6 | 54.6                 | 2.5    | 344.8           | 1,882.5    | 453.7     |
| Nonstocked                       | 38.5           | -               | -             | 15.9    | 0.8                  | -      | -               | 18.7       | 3.1       |
| All stands                       | 18,615.9       | 2,542.4         | 49.6          | 3,728.2 | 256.3                | 14.6   | 1,514.3         | 8,448.5    | 2,062.0   |

Table 35. -- Area of timberland by forest type, stand-size class, and potential productivity class,  
Michigan, 1993

(In thousand acres)

| Forest type and<br>stand-size class | All classes | Potential productivity class (cubic feet of growth per acre per year) |         |        |       |       |
|-------------------------------------|-------------|-----------------------------------------------------------------------|---------|--------|-------|-------|
|                                     |             | 165+                                                                  | 120-164 | 85-119 | 50-84 | 20-49 |
| Jack pine                           |             |                                                                       |         |        |       |       |
| Sawtimber                           | 258.0       | -                                                                     | 7.9     | 13.2   | 103.2 | 133.7 |
| Poletimber                          | 349.6       | -                                                                     | 17.0    | 28.0   | 71.4  | 233.2 |
| Sapling and seedling                | 238.5       | -                                                                     | 1.6     | 7.1    | 35.7  | 194.1 |
| All stands                          | 846.1       | -                                                                     | 26.5    | 48.3   | 210.3 | 561.0 |
| Red pine                            |             |                                                                       |         |        |       |       |
| Sawtimber                           | 430.7       | -                                                                     | 108.2   | 200.7  | 99.0  | 22.8  |
| Poletimber                          | 344.0       | -                                                                     | 102.2   | 153.7  | 76.9  | 11.2  |
| Sapling and seedling                | 122.5       | -                                                                     | 10.6    | 43.9   | 50.7  | 17.3  |
| All stands                          | 897.2       | -                                                                     | 221.0   | 398.3  | 226.6 | 51.3  |
| White pine                          |             |                                                                       |         |        |       |       |
| Sawtimber                           | 173.8       | -                                                                     | 23.8    | 46.0   | 73.8  | 30.2  |
| Poletimber                          | 30.5        | -                                                                     | 4.6     | 8.4    | 7.4   | 10.1  |
| Sapling and seedling                | 29.5        | -                                                                     | 3.3     | 13.6   | 5.7   | 6.9   |
| All stands                          | 233.8       | -                                                                     | 31.7    | 68.0   | 86.9  | 47.2  |
| Balsam fir                          |             |                                                                       |         |        |       |       |
| Sawtimber                           | 177.3       | 2.6                                                                   | 70.7    | 73.6   | 19.0  | 11.4  |
| Poletimber                          | 158.2       | 1.8                                                                   | 54.5    | 77.3   | 14.7  | 9.9   |
| Sapling and seedling                | 227.6       | -                                                                     | 66.6    | 60.0   | 52.2  | 48.8  |
| All stands                          | 563.1       | 4.4                                                                   | 191.8   | 210.9  | 85.9  | 70.1  |
| White spruce                        |             |                                                                       |         |        |       |       |
| Sawtimber                           | 47.1        | -                                                                     | -       | 15.8   | 26.8  | 4.5   |
| Poletimber                          | 48.9        | -                                                                     | -       | 16.8   | 21.5  | 10.6  |
| Sapling and seedling                | 50.9        | 0.9                                                                   | 2.3     | 17.8   | 26.0  | 3.9   |
| All stands                          | 146.9       | 0.9                                                                   | 2.3     | 50.4   | 74.3  | 19.0  |
| Black spruce                        |             |                                                                       |         |        |       |       |
| Sawtimber                           | 49.5        | -                                                                     | -       | 6.7    | 28.8  | 14.0  |
| Poletimber                          | 141.1       | -                                                                     | 1.7     | 16.0   | 35.9  | 87.5  |
| Sapling and seedling                | 274.5       | -                                                                     | -       | 14.1   | 37.0  | 223.4 |
| All stands                          | 465.1       | -                                                                     | 1.7     | 36.8   | 101.7 | 324.9 |
| Northern white-cedar                |             |                                                                       |         |        |       |       |
| Sawtimber                           | 594.8       | -                                                                     | -       | 13.0   | 174.4 | 407.4 |
| Poletimber                          | 582.2       | -                                                                     | -       | 9.6    | 117.1 | 455.5 |
| Sapling and seedling                | 172.4       | -                                                                     | -       | 3.0    | 33.9  | 135.5 |
| All stands                          | 1,349.4     | -                                                                     | -       | 25.6   | 325.4 | 998.4 |
| Tamarack                            |             |                                                                       |         |        |       |       |
| Sawtimber                           | 31.5        | -                                                                     | -       | 6.7    | 9.5   | 15.3  |
| Poletimber                          | 40.2        | -                                                                     | -       | 1.7    | 13.9  | 24.6  |
| Sapling and seedling                | 77.2        | -                                                                     | -       | 1.2    | 22.9  | 53.1  |
| All stands                          | 148.9       | -                                                                     | -       | 9.6    | 46.3  | 93.0  |

(Table 35 continued on next page)

(Table 35 continued)

| Forest type and<br>stand-size class | All classes | Potential productivity class (cubic feet of growth per acre per year) |         |         |         |         |
|-------------------------------------|-------------|-----------------------------------------------------------------------|---------|---------|---------|---------|
|                                     |             | 165+                                                                  | 120-164 | 85-119  | 50-84   | 20-49   |
| Oak-hickory                         |             |                                                                       |         |         |         |         |
| Sawtimber                           | 1,230.0     | 12.6                                                                  | 24.0    | 355.1   | 623.0   | 215.3   |
| Poletimber                          | 457.1       | 3.9                                                                   | 2.1     | 86.2    | 229.2   | 135.7   |
| Sapling and seedling                | 294.7       | -                                                                     | -       | 42.4    | 144.3   | 108.0   |
| All stands                          | 1,981.8     | 16.5                                                                  | 26.1    | 483.7   | 996.5   | 459.0   |
| Elm-ash-soft maple                  |             |                                                                       |         |         |         |         |
| Sawtimber                           | 756.5       | -                                                                     | 33.1    | 233.5   | 246.1   | 243.8   |
| Poletimber                          | 469.8       | -                                                                     | 2.4     | 94.9    | 136.3   | 236.2   |
| Sapling and seedling                | 400.6       | -                                                                     | 7.5     | 43.4    | 155.4   | 194.3   |
| All stands                          | 1,626.9     | -                                                                     | 43.0    | 371.8   | 537.8   | 674.3   |
| Maple-beech-birch                   |             |                                                                       |         |         |         |         |
| Sawtimber                           | 3,848.4     | 60.4                                                                  | 88.3    | 892.4   | 1,877.4 | 929.9   |
| Poletimber                          | 1,979.2     | 15.6                                                                  | 37.4    | 383.2   | 1,083.0 | 460.0   |
| Sapling and seedling                | 1,333.7     | 2.0                                                                   | 13.3    | 277.0   | 657.1   | 384.3   |
| All stands                          | 7,161.3     | 78.0                                                                  | 139.0   | 1,552.6 | 3,617.5 | 1,774.2 |
| Aspen                               |             |                                                                       |         |         |         |         |
| Sawtimber                           | 850.7       | 12.0                                                                  | 66.3    | 374.7   | 347.1   | 50.6    |
| Poletimber                          | 720.6       | 1.8                                                                   | 43.0    | 274.2   | 325.1   | 76.5    |
| Sapling and seedling                | 1,104.4     | 8.7                                                                   | 39.9    | 404.7   | 504.9   | 146.2   |
| All stands                          | 2,675.7     | 22.5                                                                  | 149.2   | 1,053.6 | 1,177.1 | 273.3   |
| Paper birch                         |             |                                                                       |         |         |         |         |
| Sawtimber                           | 90.4        | -                                                                     | -       | 7.6     | 35.5    | 47.3    |
| Poletimber                          | 166.8       | -                                                                     | 1.8     | 8.4     | 77.6    | 79.0    |
| Sapling and seedling                | 34.3        | -                                                                     | 1.4     | -       | 14.3    | 18.6    |
| All stands                          | 291.5       | -                                                                     | 3.2     | 16.0    | 127.4   | 144.9   |
| Balsam poplar                       |             |                                                                       |         |         |         |         |
| Sawtimber                           | 66.2        | -                                                                     | -       | 15.6    | 33.6    | 17.0    |
| Poletimber                          | 53.1        | -                                                                     | 2.1     | 15.4    | 29.5    | 6.1     |
| Sapling and seedling                | 70.4        | -                                                                     | -       | 23.5    | 23.8    | 23.1    |
| All stands                          | 189.7       | -                                                                     | 2.1     | 54.5    | 86.9    | 46.2    |
| Nonstocked                          | 38.5        | -                                                                     | -       | 7.6     | 9.5     | 21.4    |
| All forest types                    |             |                                                                       |         |         |         |         |
| Sawtimber                           | 8,604.9     | 87.6                                                                  | 422.3   | 2,254.6 | 3,697.2 | 2,143.2 |
| Poletimber                          | 5,541.3     | 23.1                                                                  | 268.8   | 1,173.8 | 2,239.5 | 1,836.1 |
| Sapling and seedling                | 4,431.2     | 11.6                                                                  | 146.5   | 951.7   | 1,763.9 | 1,557.5 |
| Nonstocked                          | 38.5        | -                                                                     | -       | 7.6     | 9.5     | 21.4    |
| All stands                          | 18,615.9    | 122.3                                                                 | 837.6   | 4,387.7 | 7,710.1 | 5,558.2 |

Table 36. -- Area of timberland by forest type, stand-age class, and Forest Survey Unit, Michigan, 1993

(in thousand acres)

| Forest Survey Unit and forest type |         | Stand-age class (years) |         |         |         |        |         |         |       |  |
|------------------------------------|---------|-------------------------|---------|---------|---------|--------|---------|---------|-------|--|
| All classes                        |         | 1-20                    | 21-40   | 41-60   | 61-80   | 81-100 | 101-120 | 121-140 | 141+  |  |
| Eastern Upper Peninsula            |         |                         |         |         |         |        |         |         |       |  |
| Jack pine                          | 195.0   | 20.8                    | 42.5    | 85.3    | 33.5    | 9.6    | 3.3     | -       | -     |  |
| Red pine                           | 158.2   | 30.6                    | 42.1    | 56.4    | 16.5    | 10.1   | 0.5     | 2.0     | -     |  |
| White pine                         | 68.1    | 9.9                     | 4.4     | 13.2    | 17.3    | 3.0    | 8.3     | 5.9     | 6.1   |  |
| Balsam fir                         | 232.6   | 76.2                    | 48.0    | 62.7    | 31.8    | 5.3    | 7.5     | 1.1     | -     |  |
| White spruce                       | 62.1    | 9.0                     | 21.2    | 16.6    | 12.8    | 2.5    | -       | -       | -     |  |
| Black spruce                       | 232.2   | 30.3                    | 110.2   | 54.2    | 24.1    | 7.9    | 3.2     | 2.3     | -     |  |
| Northern white-cedar               | 632.9   | 16.2                    | 87.8    | 111.6   | 139.5   | 111.9  | 70.5    | 48.2    | 47.2  |  |
| Tamarack                           | 54.5    | 8.6                     | 7.5     | 18.9    | 9.8     | 8.5    | -       | 1.2     | -     |  |
| Oak-hickory                        | 37.6    | 16.3                    | 4.1     | 7.7     | 6.3     | 1.9    | 1.3     | -       | -     |  |
| Elm-ash-soft maple                 | 220.7   | 39.7                    | 32.7    | 63.3    | 33.8    | 15.5   | 10.6    | 18.2    | 6.9   |  |
| Maple-beech-birch                  | 1,264.3 | 161.4                   | 123.4   | 262.4   | 265.0   | 203.2  | 105.1   | 98.1    | 45.7  |  |
| Aspen                              | 460.3   | 164.6                   | 76.8    | 96.8    | 94.3    | 20.0   | 6.6     | 1.2     | -     |  |
| Paper birch                        | 79.8    | 5.7                     | 8.8     | 24.5    | 29.1    | 5.4    | 3.7     | 2.6     | -     |  |
| Balsam poplar                      | 102.3   | 34.3                    | 17.8    | 24.2    | 13.3    | 5.3    | 3.6     | 3.8     | -     |  |
| Nonstocked                         | 8.3     | 8.3                     | -       | -       | -       | -      | -       | -       | -     |  |
| All forest types                   | 3,808.9 | 631.9                   | 627.3   | 897.8   | 727.1   | 410.1  | 224.2   | 184.6   | 105.9 |  |
| Western Upper Peninsula            |         |                         |         |         |         |        |         |         |       |  |
| Jack pine                          | 87.3    | 25.7                    | 11.2    | 27.8    | 16.6    | 2.8    | 1.4     | 1.8     | -     |  |
| Red pine                           | 97.8    | 28.1                    | 26.0    | 18.6    | 4.4     | 13.0   | 6.5     | 1.2     | -     |  |
| White pine                         | 46.2    | 4.0                     | 1.4     | 6.1     | 8.2     | 19.4   | 5.8     | -       | 1.3   |  |
| Balsam fir                         | 267.9   | 42.6                    | 63.2    | 70.3    | 46.8    | 31.3   | 7.6     | 3.6     | 2.5   |  |
| White spruce                       | 51.2    | 3.2                     | 16.3    | 11.8    | 10.4    | 6.7    | 2.8     | -       | -     |  |
| Black spruce                       | 208.2   | 29.3                    | 69.6    | 40.6    | 54.2    | 12.7   | -       | 1.8     | -     |  |
| Northern white-cedar               | 291.3   | 5.1                     | 19.2    | 40.7    | 57.3    | 57.4   | 39.9    | 32.8    | 38.9  |  |
| Tamarack                           | 48.4    | 10.3                    | 7.3     | 16.9    | 9.9     | 2.0    | 2.4     | 1.1     | 2.5   |  |
| Oak-hickory                        | 29.0    | 3.1                     | 1.4     | 3.7     | 5.0     | 5.1    | 5.6     | -       | 1.1   |  |
| Elm-ash-soft maple                 | 189.0   | 23.3                    | 28.0    | 33.9    | 45.3    | 19.9   | 11.3    | 10.9    | 16.4  |  |
| Maple-beech-birch                  | 2,465.8 | 215.4                   | 171.0   | 550.0   | 483.5   | 416.2  | 278.0   | 210.2   | 141.5 |  |
| Aspen                              | 676.6   | 262.7                   | 99.7    | 156.3   | 116.8   | 32.1   | 4.7     | 4.3     | -     |  |
| Paper birch                        | 97.9    | 1.6                     | 6.4     | 31.2    | 43.8    | 7.4    | 2.5     | 2.4     | 2.6   |  |
| Balsam poplar                      | 26.1    | 1.2                     | 5.5     | 7.1     | 8.1     | 2.4    | 1.8     | -       | -     |  |
| Nonstocked                         | 6.7     | 6.7                     | -       | -       | -       | -      | -       | -       | -     |  |
| All forest types                   | 4,589.4 | 662.3                   | 526.2   | 1,015.0 | 910.3   | 628.4  | 370.3   | 270.1   | 206.8 |  |
| Northern Lower Peninsula           |         |                         |         |         |         |        |         |         |       |  |
| Jack pine                          | 520.6   | 123.7                   | 185.7   | 137.7   | 54.8    | 18.7   | -       | -       | -     |  |
| Red pine                           | 591.8   | 80.4                    | 279.3   | 159.3   | 25.8    | 31.9   | 7.6     | 7.5     | -     |  |
| White pine                         | 95.9    | 5.2                     | 24.0    | 14.8    | 20.9    | 18.0   | 9.7     | 0.8     | 2.5   |  |
| Balsam fir                         | 62.6    | 7.7                     | 25.2    | 7.5     | 17.6    | 2.4    | -       | -       | 2.2   |  |
| White spruce                       | 25.0    | 5.4                     | 10.6    | 1.5     | 6.3     | -      | -       | -       | 1.2   |  |
| Black spruce                       | 24.7    | 6.9                     | 5.2     | 3.1     | 8.2     | 1.3    | -       | -       | -     |  |
| Northern white-cedar               | 419.2   | 7.5                     | 27.8    | 56.2    | 122.4   | 91.5   | 44.8    | 39.4    | 29.6  |  |
| Tamarack                           | 38.2    | 4.4                     | 11.3    | 11.6    | 3.8     | 3.2    | 3.3     | 0.6     | -     |  |
| Oak-hickory                        | 1,168.8 | 154.6                   | 116.0   | 250.1   | 319.5   | 163.3  | 91.8    | 55.0    | 18.5  |  |
| Elm-ash-soft maple                 | 545.9   | 109.1                   | 120.8   | 131.2   | 85.3    | 54.4   | 30.2    | 7.5     | 7.4   |  |
| Maple-beech-birch                  | 2,130.3 | 401.0                   | 266.7   | 543.4   | 477.0   | 249.5  | 107.3   | 62.2    | 23.2  |  |
| Aspen                              | 1,415.8 | 404.4                   | 327.0   | 311.0   | 239.5   | 95.7   | 23.4    | 10.6    | 4.2   |  |
| Paper birch                        | 106.8   | 7.5                     | 13.4    | 31.8    | 37.6    | 10.0   | 2.0     | 4.5     | -     |  |
| Balsam poplar                      | 54.4    | 23.1                    | 4.6     | 8.7     | 10.4    | 3.3    | -       | -       | 4.3   |  |
| Nonstocked                         | 16.9    | 15.0                    | 1.9     | -       | -       | -      | -       | -       | -     |  |
| All forest types                   | 7,216.9 | 1,355.9                 | 1,419.5 | 1,667.9 | 1,429.1 | 743.2  | 320.1   | 188.1   | 93.1  |  |

Table 36 continued on next page)

(Table 36 continued on next page)

(Table 36 continued)

| Forest Survey<br>Unit and forest type | All classes | Stand-age class (years) |         |         |         |         |         |         |       |
|---------------------------------------|-------------|-------------------------|---------|---------|---------|---------|---------|---------|-------|
|                                       |             | 1-20                    | 21-40   | 41-60   | 61-80   | 81-100  | 101-120 | 121-140 | 141+  |
| Southern Lower Peninsula              |             |                         |         |         |         |         |         |         |       |
| Jack pine                             | 43.2        | 6.5                     | 21.8    | 11.8    | 3.1     | -       | -       | -       | -     |
| Red pine                              | 49.4        | -                       | 22.0    | 24.8    | 2.6     | -       | -       | -       | -     |
| White pine                            | 23.6        | 6.3                     | 12.7    | 1.9     | 2.7     | -       | -       | -       | -     |
| White spruce                          | 8.6         | 3.7                     | 4.9     | -       | -       | -       | -       | -       | -     |
| Northern white-cedar                  | 6.0         | -                       | 3.0     | -       | 3.0     | -       | -       | -       | -     |
| Tamarack                              | 7.8         | -                       | 4.8     | 3.0     | -       | -       | -       | -       | -     |
| Oak-hickory                           | 746.4       | 87.3                    | 52.9    | 120.6   | 162.7   | 173.7   | 75.4    | 65.2    | 8.6   |
| Elm-ash-soft maple                    | 671.3       | 135.2                   | 148.7   | 128.3   | 138.5   | 66.0    | 41.6    | 13.0    | -     |
| Maple-beech-birch                     | 1,300.9     | 271.0                   | 312.8   | 288.8   | 198.5   | 127.4   | 77.3    | 20.6    | 4.5   |
| Aspen                                 | 123.0       | 66.1                    | 39.1    | 3.0     | 11.8    | -       | -       | -       | 3.0   |
| Paper birch                           | 7.0         | 7.0                     | -       | -       | -       | -       | -       | -       | -     |
| Balsam poplar                         | 6.9         | -                       | 1.1     | 2.9     | 2.9     | -       | -       | -       | -     |
| Nonstocked                            | 6.6         | -                       | 6.6     | -       | -       | -       | -       | -       | -     |
| All forest types                      | 3,000.7     | 583.1                   | 630.4   | 585.1   | 525.8   | 367.1   | 194.3   | 98.8    | 16.1  |
| All units                             |             |                         |         |         |         |         |         |         |       |
| Jack pine                             | 846.1       | 176.7                   | 261.2   | 262.6   | 108.0   | 31.1    | 4.7     | 1.8     | -     |
| Red pine                              | 897.2       | 139.1                   | 369.4   | 259.1   | 49.3    | 55.0    | 14.6    | 10.7    | -     |
| White pine                            | 233.8       | 25.4                    | 42.5    | 36.0    | 49.1    | 40.4    | 23.8    | 6.7     | 9.9   |
| Balsam fir                            | 563.1       | 126.5                   | 136.4   | 140.5   | 96.2    | 39.0    | 15.1    | 4.7     | 4.7   |
| White spruce                          | 146.9       | 21.3                    | 53.0    | 29.9    | 29.5    | 9.2     | 2.8     | -       | 1.2   |
| Black spruce                          | 465.1       | 66.5                    | 185.0   | 97.9    | 86.5    | 21.9    | 3.2     | 4.1     | -     |
| Northern white-cedar                  | 1,349.4     | 28.8                    | 137.8   | 208.5   | 322.2   | 260.8   | 155.2   | 120.4   | 115.7 |
| Tamarack                              | 148.9       | 23.3                    | 30.9    | 50.4    | 19.5    | 13.7    | 5.7     | 2.9     | 2.5   |
| Oak-hickory                           | 1,981.8     | 261.3                   | 174.4   | 382.1   | 497.5   | 344.0   | 174.1   | 120.2   | 28.2  |
| Elm-ash-soft maple                    | 1,626.9     | 307.3                   | 330.2   | 356.7   | 302.9   | 155.8   | 93.7    | 49.6    | 30.7  |
| Maple-beech-birch                     | 7,161.3     | 1,048.8                 | 873.9   | 1,644.6 | 1,424.0 | 996.3   | 567.7   | 391.1   | 214.9 |
| Aspen                                 | 2,675.7     | 897.8                   | 542.6   | 567.1   | 462.4   | 147.8   | 34.7    | 16.1    | 7.2   |
| Paper birch                           | 291.5       | 21.8                    | 28.6    | 87.5    | 110.5   | 22.8    | 8.2     | 9.5     | 2.6   |
| Balsam poplar                         | 189.7       | 58.6                    | 29.0    | 42.9    | 34.7    | 11.0    | 5.4     | 3.8     | 4.3   |
| Nonstocked                            | 38.5        | 30.0                    | 8.5     | -       | -       | -       | -       | -       | -     |
| All forest types                      | 18,615.9    | 3,233.2                 | 3,203.4 | 4,165.8 | 3,592.3 | 2,148.8 | 1,108.9 | 741.6   | 421.9 |

Table 37. -- Area of timberland by forest type, site-index class, and Forest Survey Unit, Michigan, 1993

(In thousand acres)

| Forest Survey            |             | Site-index class (height in feet of dominant and codominant site trees at 50 years of age) |       |       |       |         |         |         |       |       |
|--------------------------|-------------|--------------------------------------------------------------------------------------------|-------|-------|-------|---------|---------|---------|-------|-------|
| Unit and forest type     | All classes | 11-20                                                                                      | 21-30 | 31-40 | 41-50 | 51-60   | 61-70   | 71-80   | 81-90 | 91+   |
| Eastern Upper Peninsula  |             |                                                                                            |       |       |       |         |         |         |       |       |
| Jack pine                | 195.0       | -                                                                                          | -     | 8.7   | 66.0  | 75.4    | 39.5    | 5.4     | -     | -     |
| Red pine                 | 158.2       | -                                                                                          | -     | 2.7   | 21.3  | 44.5    | 53.6    | 33.1    | 3.0   | -     |
| White pine               | 68.1        | -                                                                                          | -     | 4.7   | 23.2  | 22.1    | 15.8    | 2.3     | -     | -     |
| Balsam fir               | 232.6       | -                                                                                          | 2.4   | 42.4  | 54.8  | 67.0    | 42.2    | 22.0    | 1.8   | -     |
| White spruce             | 62.1        | -                                                                                          | -     | 4.1   | 17.1  | 19.3    | 16.3    | 1.4     | 3.9   | -     |
| Black spruce             | 232.2       | 3.5                                                                                        | 29.9  | 62.9  | 83.7  | 46.6    | 5.6     | -       | -     | -     |
| Northern white-cedar     | 632.9       | 20.7                                                                                       | 213.0 | 185.6 | 116.1 | 65.0    | 23.1    | 9.4     | -     | -     |
| Tamarack                 | 54.5        | -                                                                                          | 11.0  | 24.5  | 11.1  | 4.5     | 1.1     | 2.3     | -     | -     |
| Oak-hickory              | 37.6        | -                                                                                          | -     | 11.4  | 1.3   | 12.2    | 6.8     | 3.3     | 2.6   | -     |
| Elm-ash-soft maple       | 220.7       | -                                                                                          | 8.5   | 21.3  | 49.7  | 72.5    | 50.1    | 14.7    | 3.9   | -     |
| Maple-beech-birch        | 1,264.3     | -                                                                                          | 5.2   | 21.3  | 103.3 | 360.9   | 483.2   | 231.2   | 50.2  | 9.0   |
| Aspen                    | 460.3       | -                                                                                          | -     | 23.2  | 48.6  | 118.2   | 106.9   | 123.2   | 38.9  | 1.3   |
| Paper birch              | 79.8        | -                                                                                          | -     | 6.5   | 10.1  | 22.1    | 35.4    | 3.9     | -     | 1.8   |
| Balsam poplar            | 102.3       | -                                                                                          | -     | 4.6   | 19.4  | 19.2    | 34.4    | 19.2    | 5.5   | -     |
| Nonstocked               | 8.3         | 1.2                                                                                        | -     | 1.1   | 2.1   | -       | 3.9     | -       | -     | -     |
| All forest types         | 3,808.9     | 25.4                                                                                       | 270.0 | 425.0 | 627.8 | 949.5   | 917.9   | 471.4   | 109.8 | 12.1  |
| Western Upper Peninsula  |             |                                                                                            |       |       |       |         |         |         |       |       |
| Jack pine                | 87.3        | -                                                                                          | -     | 5.1   | 13.5  | 19.8    | 24.7    | 22.8    | 1.4   | -     |
| Red pine                 | 97.8        | -                                                                                          | -     | 1.8   | 6.4   | 22.1    | 20.6    | 41.9    | 5.0   | -     |
| White pine               | 46.2        | -                                                                                          | -     | 2.8   | 9.4   | 17.0    | 7.4     | 6.3     | 3.3   | -     |
| Balsam fir               | 267.9       | 1.3                                                                                        | 1.9   | 19.3  | 63.0  | 88.0    | 64.0    | 26.3    | 4.1   | -     |
| White spruce             | 51.2        | -                                                                                          | -     | 1.2   | 7.7   | 17.3    | 20.0    | 4.1     | -     | 0.9   |
| Black spruce             | 208.2       | -                                                                                          | 9.9   | 53.1  | 79.6  | 47.5    | 12.0    | 6.1     | -     | -     |
| Northern white-cedar     | 291.3       | 14.5                                                                                       | 87.5  | 74.7  | 65.1  | 33.0    | 16.5    | -       | -     | -     |
| Tamarack                 | 48.4        | -                                                                                          | 1.4   | 7.1   | 18.9  | 16.3    | 3.0     | 1.7     | -     | -     |
| Oak-hickory              | 29.0        | -                                                                                          | -     | -     | 8.8   | 4.6     | 11.3    | 2.9     | 1.4   | -     |
| Elm-ash-soft maple       | 189.0       | -                                                                                          | 5.8   | 21.1  | 44.2  | 56.0    | 41.1    | 16.7    | 4.1   | -     |
| Maple-beech-birch        | 2,465.8     | -                                                                                          | 3.8   | 32.3  | 224.8 | 630.1   | 879.4   | 547.2   | 133.5 | 14.7  |
| Aspen                    | 676.6       | -                                                                                          | 0.8   | 8.9   | 21.8  | 108.3   | 205.0   | 194.0   | 111.9 | 25.9  |
| Paper birch              | 97.9        | -                                                                                          | -     | 1.3   | 8.7   | 35.4    | 33.3    | 15.6    | 3.6   | -     |
| Balsam poplar            | 26.1        | -                                                                                          | -     | -     | -     | 3.9     | 12.2    | 7.2     | 2.8   | -     |
| Nonstocked               | 6.7         | -                                                                                          | -     | -     | 0.8   | 4.2     | 1.7     | -       | -     | -     |
| All forest types         | 4,589.4     | 15.8                                                                                       | 111.1 | 228.7 | 572.7 | 1,103.5 | 1,352.2 | 892.8   | 271.1 | 41.5  |
| Northern Lower Peninsula |             |                                                                                            |       |       |       |         |         |         |       |       |
| Jack pine                | 520.6       | -                                                                                          | -     | 90.2  | 196.7 | 149.8   | 61.5    | 15.2    | 5.7   | 1.5   |
| Red pine                 | 591.8       | -                                                                                          | -     | 11.7  | 64.2  | 131.7   | 180.2   | 158.9   | 45.1  | -     |
| White pine               | 95.9        | -                                                                                          | -     | 2.9   | 26.7  | 37.5    | 9.3     | 13.2    | 6.3   | -     |
| Balsam fir               | 62.6        | -                                                                                          | -     | 12.9  | 16.2  | 13.4    | 10.6    | 7.4     | 2.1   | -     |
| White spruce             | 25.0        | -                                                                                          | 2.4   | 5.9   | 2.2   | 2.3     | 3.4     | 7.8     | -     | 1.0   |
| Black spruce             | 24.7        | -                                                                                          | -     | 7.8   | 10.6  | 1.2     | 1.5     | -       | 3.6   | -     |
| Northern white-cedar     | 419.2       | 8.7                                                                                        | 76.6  | 146.0 | 97.5  | 63.3    | 18.0    | 7.4     | 1.7   | -     |
| Tamarack                 | 38.2        | -                                                                                          | 1.0   | 6.8   | 17.4  | 3.7     | 6.7     | 2.6     | -     | -     |
| Oak-hickory              | 1,168.8     | -                                                                                          | -     | 33.9  | 199.7 | 374.5   | 301.6   | 180.1   | 65.2  | 13.8  |
| Elm-ash-soft maple       | 545.9       | -                                                                                          | 1.7   | 22.9  | 48.9  | 108.0   | 187.1   | 92.2    | 54.9  | 30.2  |
| Maple-beech-birch        | 2,130.3     | -                                                                                          | -     | 33.6  | 133.6 | 371.4   | 622.6   | 622.8   | 282.6 | 63.7  |
| Aspen                    | 1,415.8     | -                                                                                          | -     | 12.7  | 39.3  | 197.3   | 422.0   | 398.7   | 260.0 | 85.8  |
| Paper birch              | 106.8       | -                                                                                          | -     | 3.8   | 10.3  | 38.0    | 26.1    | 20.5    | 8.1   | -     |
| Balsam poplar            | 54.4        | -                                                                                          | -     | 3.7   | 8.5   | 11.1    | 6.6     | 18.3    | 4.1   | 2.1   |
| Nonstocked               | 16.9        | -                                                                                          | -     | 6.4   | 1.0   | -       | 6.1     | 1.2     | 2.2   | -     |
| All forest types         | 7,216.9     | 8.7                                                                                        | 81.7  | 401.2 | 872.8 | 1,503.2 | 1,863.3 | 1,546.3 | 741.6 | 198.1 |

(Table 37 continued on next page)

(Table 37 continued)

| Forest Survey            |             | Site-index class (height in feet of dominant and codominant site trees at 50 years of age) |       |         |         |         |         |         |         |       |
|--------------------------|-------------|--------------------------------------------------------------------------------------------|-------|---------|---------|---------|---------|---------|---------|-------|
| Unit and forest type     | All classes | 11-20                                                                                      | 21-30 | 31-40   | 41-50   | 51-60   | 61-70   | 71-80   | 81-90   | 91+   |
| Southern Lower Peninsula |             |                                                                                            |       |         |         |         |         |         |         |       |
| Jack pine                | 43.2        | -                                                                                          | -     | -       | 4.6     | 7.8     | 13.5    | 10.6    | 2.7     | 4.0   |
| Red pine                 | 49.4        | -                                                                                          | -     | -       | 3.4     | 13.2    | 7.3     | 14.7    | 10.8    | -     |
| White pine               | 23.6        | -                                                                                          | -     | -       | -       | 0.6     | 11.6    | 6.7     | 4.7     | -     |
| White spruce             | 8.6         | -                                                                                          | -     | -       | -       | -       | 1.1     | 7.5     | -       | -     |
| Northern white-cedar     | 6.0         | -                                                                                          | 3.0   | -       | -       | 3.0     | -       | -       | -       | -     |
| Tamarack                 | 7.8         | -                                                                                          | -     | -       | 0.7     | 4.1     | -       | -       | 3.0     | -     |
| Oak-hickory              | 746.4       | -                                                                                          | -     | 6.6     | 19.0    | 97.3    | 207.4   | 209.8   | 163.3   | 43.0  |
| Elm-ash-soft maple       | 671.3       | -                                                                                          | -     | 5.9     | 16.1    | 55.7    | 124.5   | 176.8   | 201.0   | 91.3  |
| Maple-beech-birch        | 1,300.9     | -                                                                                          | -     | 3.8     | 14.7    | 76.3    | 228.8   | 384.6   | 397.1   | 195.6 |
| Aspen                    | 123.0       | -                                                                                          | -     | -       | -       | 9.8     | 43.5    | 34.0    | 25.2    | 10.5  |
| Paper birch              | 7.0         | -                                                                                          | -     | -       | -       | -       | 5.3     | 1.7     | -       | -     |
| Balsam poplar            | 6.9         | -                                                                                          | -     | -       | -       | -       | 2.9     | 1.1     | 2.9     | -     |
| Nonstocked               | 6.6         | -                                                                                          | -     | -       | 6.6     | -       | -       | -       | -       | -     |
| All forest types         | 3,000.7     | -                                                                                          | 3.0   | 16.3    | 65.1    | 267.8   | 645.9   | 847.5   | 810.7   | 344.4 |
| All units                |             |                                                                                            |       |         |         |         |         |         |         |       |
| Jack pine                | 846.1       | -                                                                                          | -     | 104.0   | 280.8   | 252.8   | 139.2   | 54.0    | 9.8     | 5.5   |
| Red pine                 | 897.2       | -                                                                                          | -     | 16.2    | 95.3    | 211.5   | 261.7   | 248.6   | 63.9    | -     |
| White pine               | 233.8       | -                                                                                          | -     | 10.4    | 59.3    | 77.2    | 44.1    | 28.5    | 14.3    | -     |
| Balsam fir               | 563.1       | 1.3                                                                                        | 4.3   | 74.6    | 134.0   | 168.4   | 116.8   | 55.7    | 8.0     | -     |
| White spruce             | 146.9       | -                                                                                          | 2.4   | 11.2    | 27.0    | 38.9    | 40.8    | 20.8    | 3.9     | 1.9   |
| Black spruce             | 465.1       | 3.5                                                                                        | 39.8  | 123.8   | 173.9   | 95.3    | 19.1    | 6.1     | 3.6     | -     |
| Northern white-cedar     | 1,349.4     | 43.9                                                                                       | 380.1 | 406.3   | 278.7   | 164.3   | 57.6    | 16.8    | 1.7     | -     |
| Tamarack                 | 148.9       | -                                                                                          | 13.4  | 38.4    | 48.1    | 28.6    | 10.8    | 6.6     | 3.0     | -     |
| Oak-hickory              | 1,981.8     | -                                                                                          | -     | 51.9    | 228.8   | 488.6   | 527.1   | 396.1   | 232.5   | 56.8  |
| Elm-ash-soft maple       | 1,626.9     | -                                                                                          | 16.0  | 71.2    | 158.9   | 292.2   | 402.8   | 300.4   | 263.9   | 121.5 |
| Maple-beech-birch        | 7,161.3     | -                                                                                          | 9.0   | 91.0    | 476.4   | 1,438.7 | 2,214.0 | 1,785.8 | 863.4   | 283.0 |
| Aspen                    | 2,675.7     | -                                                                                          | 0.8   | 44.8    | 109.7   | 433.6   | 777.4   | 749.9   | 436.0   | 123.5 |
| Paper birch              | 291.5       | -                                                                                          | -     | 11.6    | 29.1    | 95.5    | 100.1   | 41.7    | 11.7    | 1.8   |
| Balsam poplar            | 189.7       | -                                                                                          | -     | 8.3     | 27.9    | 34.2    | 56.1    | 45.8    | 15.3    | 2.1   |
| Nonstocked               | 38.5        | 1.2                                                                                        | -     | 7.5     | 10.5    | 4.2     | 11.7    | 1.2     | 2.2     | -     |
| All forest types         | 18,615.9    | 49.9                                                                                       | 465.8 | 1,071.2 | 2,138.4 | 3,824.0 | 4,779.3 | 3,758.0 | 1,933.2 | 596.1 |

Table 38. --- Area of timberland by forest type, basal-area class, and stand-size class, Michigan, 1993

(In thousand acres)

| Forest type and<br>stand-size class | All classes | Basal-area class (square feet per acre) |       |       |       |       |       |       |       |       |        |         |         |         |       |
|-------------------------------------|-------------|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|--------|---------|---------|---------|-------|
|                                     |             | 0-10                                    | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+  |
| Jack pine                           |             |                                         |       |       |       |       |       |       |       |       |        |         |         |         |       |
| Sawtimber                           | 258.0       | -                                       | -     | 2.5   | 8.2   | 22.1  | 37.8  | 36.2  | 27.7  | 30.5  | 28.5   | 25.6    | 26.9    | 6.1     | 5.9   |
| Poetimber                           | 349.6       | -                                       | 5.2   | 2.5   | 13.1  | 23.4  | 29.8  | 51.1  | 43.3  | 37.8  | 39.2   | 49.9    | 43.9    | 7.1     | 3.3   |
| Sapling and seedling                | 238.5       | 60.7                                    | 37.6  | 33.2  | 27.2  | 27.8  | 12.0  | 13.7  | 16.2  | 7.2   | 1.1    | 1.8     | -       | -       | -     |
| All stands                          | 846.1       | 60.7                                    | 42.8  | 38.2  | 48.5  | 73.3  | 79.6  | 101.0 | 87.2  | 75.5  | 68.8   | 77.3    | 70.8    | 13.2    | 9.2   |
| Red pine                            |             |                                         |       |       |       |       |       |       |       |       |        |         |         |         |       |
| Sawtimber                           | 430.7       | -                                       | 3.9   | -     | 3.6   | 2.4   | 27.2  | 8.6   | 18.6  | 34.9  | 19.9   | 98.7    | 97.2    | 72.4    | 43.3  |
| Poetimber                           | 344.0       | -                                       | 1.3   | 2.5   | 0.4   | 12.0  | 10.4  | 14.6  | 32.0  | 18.7  | 33.8   | 44.8    | 53.4    | 59.9    | 60.2  |
| Sapling and seedling                | 122.5       | 34.2                                    | 16.2  | 8.5   | 27.1  | 7.8   | 7.2   | -     | 11.5  | 1.3   | 2.4    | 2.1     | 2.7     | 1.5     | -     |
| All stands                          | 897.2       | 34.2                                    | 21.4  | 11.0  | 31.1  | 22.2  | 44.8  | 23.2  | 62.1  | 54.9  | 56.1   | 145.6   | 153.3   | 133.8   | 103.5 |
| White pine                          |             |                                         |       |       |       |       |       |       |       |       |        |         |         |         |       |
| Sawtimber                           | 173.8       | -                                       | -     | 0.6   | -     | 3.1   | 3.5   | 18.0  | 7.6   | 17.3  | 20.8   | 35.9    | 34.2    | 19.7    | 13.1  |
| Poetimber                           | 30.5        | -                                       | -     | -     | 1.1   | 1.3   | 1.3   | 8.2   | 1.2   | 3.1   | 2.3    | 5.3     | 5.6     | 1.1     | -     |
| Sapling and seedling                | 29.5        | 2.8                                     | 4.4   | 0.6   | 6.8   | 6.1   | 1.2   | 0.9   | 5.8   | 0.9   | -      | -       | -       | -       | -     |
| All stands                          | 233.8       | 2.8                                     | 4.4   | 1.2   | 7.9   | 10.5  | 6.0   | 27.1  | 14.6  | 21.3  | 23.1   | 41.2    | 39.8    | 20.8    | 13.1  |
| Balsam fir                          |             |                                         |       |       |       |       |       |       |       |       |        |         |         |         |       |
| Sawtimber                           | 177.3       | -                                       | -     | 3.4   | -     | 2.8   | 7.1   | 9.8   | 8.3   | 20.4  | 14.9   | 29.9    | 49.8    | 23.9    | 7.0   |
| Poetimber                           | 158.2       | -                                       | -     | -     | -     | 4.4   | 3.4   | 6.8   | 12.8  | 16.8  | 24.7   | 27.4    | 41.9    | 12.8    | 7.2   |
| Sapling and seedling                | 227.6       | 25.2                                    | 17.3  | 11.7  | 17.4  | 29.3  | 18.8  | 31.6  | 33.9  | 15.1  | 11.6   | 10.0    | 4.5     | 1.2     | -     |
| All stands                          | 563.1       | 25.2                                    | 17.3  | 15.1  | 17.4  | 36.5  | 29.3  | 48.2  | 55.0  | 52.3  | 51.2   | 67.3    | 96.2    | 37.9    | 14.2  |
| White spruce                        |             |                                         |       |       |       |       |       |       |       |       |        |         |         |         |       |
| Sawtimber                           | 47.1        | -                                       | -     | -     | -     | 2.9   | 6.7   | 1.0   | 1.0   | 3.9   | 10.0   | 8.8     | 9.4     | 4.4     | -     |
| Poetimber                           | 48.9        | -                                       | -     | -     | 3.9   | -     | -     | -     | 16.4  | 3.1   | 2.9    | 3.7     | 14.4    | 4.5     | -     |
| Sapling and seedling                | 50.9        | 6.1                                     | 4.7   | 4.5   | 3.8   | 9.1   | 0.8   | -     | 10.3  | 2.6   | -      | 7.7     | 1.3     | -       | -     |
| All stands                          | 146.9       | 6.1                                     | 4.7   | 4.5   | 7.7   | 9.1   | 3.7   | 6.7   | 27.7  | 9.6   | 12.9   | 20.2    | 25.1    | 8.9     | -     |
| Black spruce                        |             |                                         |       |       |       |       |       |       |       |       |        |         |         |         |       |
| Sawtimber                           | 49.5        | -                                       | -     | -     | 1.2   | 3.0   | 3.5   | 8.6   | 2.7   | 8.5   | 3.6    | 7.6     | 10.8    | -       | -     |
| Poetimber                           | 141.1       | -                                       | 1.1   | 2.0   | -     | 3.8   | 7.1   | 14.9  | 12.1  | 19.1  | 24.6   | 35.7    | 15.0    | 1.4     | 4.3   |
| Sapling and seedling                | 274.5       | 19.3                                    | 19.8  | 25.4  | 25.3  | 44.6  | 41.6  | 34.2  | 18.3  | 15.2  | 15.5   | 15.3    | -       | -       | -     |
| All stands                          | 465.1       | 19.3                                    | 20.9  | 27.4  | 26.5  | 51.4  | 52.2  | 57.7  | 33.1  | 42.8  | 43.7   | 58.6    | 25.8    | 1.4     | 4.3   |
| Northern white-cedar                |             |                                         |       |       |       |       |       |       |       |       |        |         |         |         |       |
| Sawtimber                           | 594.8       | -                                       | 1.3   | 1.5   | 6.9   | 5.2   | 8.7   | 10.3  | 16.0  | 26.7  | 22.7   | 91.0    | 155.6   | 127.4   | 121.5 |
| Poetimber                           | 582.2       | -                                       | -     | -     | 1.1   | 4.5   | 6.2   | 13.0  | 8.4   | 19.9  | 13.8   | 57.2    | 147.4   | 141.3   | 169.4 |
| Sapling and seedling                | 172.4       | 5.3                                     | 3.7   | 4.6   | 12.3  | 13.1  | 7.9   | 14.1  | 10.2  | 11.8  | 10.1   | 24.1    | 38.3    | 14.1    | 2.8   |
| All stands                          | 1,349.4     | 5.3                                     | 5.0   | 6.1   | 20.3  | 22.8  | 22.8  | 37.4  | 34.6  | 58.4  | 46.6   | 172.3   | 341.3   | 282.8   | 293.7 |
| Tamarack                            |             |                                         |       |       |       |       |       |       |       |       |        |         |         |         |       |
| Sawtimber                           | 31.5        | -                                       | 6.0   | 0.6   | -     | 3.7   | 4.1   | 3.6   | 5.1   | 1.1   | -      | 4.7     | -       | -       | 2.6   |
| Poetimber                           | 40.2        | -                                       | -     | -     | 0.7   | 6.5   | 5.8   | 1.0   | 4.3   | 6.0   | 3.6    | 3.9     | 8.4     | -       | -     |
| Sapling and seedling                | 77.2        | 5.0                                     | 15.5  | 8.8   | 13.5  | 5.4   | 8.0   | 5.1   | 3.9   | 5.2   | -      | 5.6     | 1.2     | -       | -     |
| All stands                          | 148.9       | 5.0                                     | 21.5  | 9.4   | 14.2  | 15.6  | 17.9  | 9.7   | 13.3  | 12.3  | 3.6    | 14.2    | 9.6     | -       | 2.6   |

(Table 38 continued on next page)

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(Table 38 continued)

| Forest type and stand-size class | Basal-area class (square feet per acre) |       |       |       |       |       |       |         |         |         |         |         |         |         |       |
|----------------------------------|-----------------------------------------|-------|-------|-------|-------|-------|-------|---------|---------|---------|---------|---------|---------|---------|-------|
|                                  | All classes                             | 0-10  | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70   | 71-80   | 81-90   | 91-100  | 101-120 | 121-150 | 151-180 | 181+  |
| <b>Oak-hickory</b>               |                                         |       |       |       |       |       |       |         |         |         |         |         |         |         |       |
| Sawtimber                        | 1,230.0                                 | 4.1   | -     | 8.6   | 9.4   | 25.9  | 43.5  | 93.3    | 134.9   | 146.4   | 128.9   | 326.0   | 211.8   | 90.8    | 6.4   |
| Poetimber                        | 457.1                                   | -     | 0.5   | 3.2   | 4.4   | 12.6  | 22.5  | 54.4    | 56.7    | 50.6    | 66.8    | 106.6   | 54.7    | 22.1    | 2.0   |
| Sapling and seedling             | 294.7                                   | 36.3  | 49.6  | 35.1  | 27.7  | 35.7  | 52.6  | 24.6    | 14.1    | 4.6     | 13.2    | 1.2     | -       | -       | -     |
| All stands                       | 1,981.8                                 | 40.4  | 50.1  | 46.9  | 41.5  | 74.2  | 118.6 | 172.3   | 205.7   | 201.6   | 208.9   | 433.8   | 266.5   | 112.9   | 8.4   |
| <b>Elm-ash-soft maple</b>        |                                         |       |       |       |       |       |       |         |         |         |         |         |         |         |       |
| Sawtimber                        | 756.5                                   | -     | -     | 21.6  | 23.7  | 58.4  | 26.0  | 30.9    | 54.7    | 52.6    | 64.8    | 162.2   | 158.1   | 77.0    | 26.5  |
| Poetimber                        | 469.8                                   | -     | 7.7   | 28.2  | 7.5   | 17.0  | 39.5  | 40.9    | 41.0    | 41.6    | 32.6    | 96.5    | 78.3    | 30.9    | 8.1   |
| Sapling and seedling             | 400.6                                   | 21.6  | 40.3  | 48.3  | 84.2  | 39.2  | 39.5  | 49.5    | 17.4    | 28.1    | 18.6    | 6.7     | 7.2     | -       | -     |
| All stands                       | 1,626.9                                 | 21.6  | 48.0  | 98.1  | 115.4 | 114.6 | 105.0 | 121.3   | 113.1   | 122.3   | 116.0   | 265.4   | 243.6   | 107.9   | 34.6  |
| <b>Maple-beech-birch</b>         |                                         |       |       |       |       |       |       |         |         |         |         |         |         |         |       |
| Sawtimber                        | 3,848.4                                 | -     | 4.4   | 4.3   | 16.8  | 47.0  | 90.9  | 116.6   | 202.1   | 293.4   | 330.0   | 791.4   | 1,197.8 | 586.5   | 167.2 |
| Poetimber                        | 1,979.2                                 | -     | 4.3   | 6.7   | 29.0  | 26.6  | 61.5  | 61.5    | 121.4   | 160.6   | 248.1   | 392.6   | 541.1   | 266.2   | 59.6  |
| Sapling and seedling             | 1,333.7                                 | 131.1 | 146.3 | 132.7 | 132.7 | 180.4 | 138.8 | 177.9   | 123.7   | 74.2    | 63.3    | 30.1    | 2.5     | -       | -     |
| All stands                       | 7,161.3                                 | 131.1 | 155.0 | 143.7 | 178.5 | 254.0 | 291.2 | 356.0   | 447.2   | 528.2   | 641.4   | 1,214.1 | 1,741.4 | 852.7   | 226.8 |
| <b>Aspen</b>                     |                                         |       |       |       |       |       |       |         |         |         |         |         |         |         |       |
| Sawtimber                        | 850.7                                   | -     | 1.4   | -     | 4.0   | 11.1  | 28.0  | 62.7    | 83.4    | 72.1    | 107.9   | 166.7   | 185.9   | 91.6    | 35.9  |
| Poetimber                        | 720.6                                   | -     | -     | 9.1   | 13.2  | 48.1  | 20.1  | 53.1    | 65.1    | 63.4    | 81.3    | 145.2   | 134.1   | 71.4    | 16.5  |
| Sapling and seedling             | 1,104.4                                 | 139.3 | 114.3 | 125.9 | 128.6 | 141.5 | 137.5 | 119.2   | 60.9    | 64.6    | 29.4    | 40.0    | 3.2     | -       | -     |
| All stands                       | 2,675.7                                 | 139.3 | 115.7 | 135.0 | 145.8 | 200.7 | 185.6 | 235.0   | 209.4   | 200.1   | 218.6   | 351.9   | 323.2   | 163.0   | 52.4  |
| <b>Paper birch</b>               |                                         |       |       |       |       |       |       |         |         |         |         |         |         |         |       |
| Sawtimber                        | 90.4                                    | -     | -     | -     | -     | 3.5   | -     | 8.2     | 3.7     | 5.5     | 9.1     | 18.4    | 29.7    | 10.0    | 2.3   |
| Poetimber                        | 166.8                                   | -     | -     | -     | 1.2   | 1.0   | 9.3   | 4.9     | 6.2     | 5.9     | 17.3    | 36.7    | 51.8    | 26.0    | 6.5   |
| Sapling and seedling             | 34.3                                    | 13.0  | 5.9   | -     | 7.7   | -     | 2.3   | 1.2     | 1.1     | 0.8     | 2.3     | -       | -       | -       | -     |
| All stands                       | 291.5                                   | 13.0  | 5.9   | -     | 8.9   | 4.5   | 11.6  | 14.3    | 11.0    | 12.2    | 28.7    | 55.1    | 81.5    | 36.0    | 8.8   |
| <b>Balsam poplar</b>             |                                         |       |       |       |       |       |       |         |         |         |         |         |         |         |       |
| Sawtimber                        | 66.2                                    | -     | -     | 1.4   | -     | 4.7   | 6.2   | 8.4     | -       | 2.6     | 4.3     | 12.4    | 20.1    | 4.9     | 1.2   |
| Poetimber                        | 53.1                                    | -     | -     | -     | 4.0   | 1.2   | 2.2   | 9.7     | -       | 8.1     | 2.4     | 15.8    | 4.7     | 3.6     | 1.4   |
| Sapling and seedling             | 70.4                                    | 14.8  | 12.6  | 6.3   | 11.4  | 14.0  | 4.2   | 3.0     | 4.1     | -       | -       | -       | -       | -       | -     |
| All stands                       | 189.7                                   | 14.8  | 12.6  | 7.7   | 15.4  | 19.9  | 12.6  | 21.1    | 4.1     | 10.7    | 6.7     | 28.2    | 24.8    | 8.5     | 2.6   |
| <b>Nonstocked</b>                |                                         |       |       |       |       |       |       |         |         |         |         |         |         |         |       |
| All forest types                 | 38.5                                    | 36.4  | 2.1   | -     | -     | -     | -     | -       | -       | -       | -       | -       | -       | -       | -     |
| <b>All forest types</b>          |                                         |       |       |       |       |       |       |         |         |         |         |         |         |         |       |
| Sawtimber                        | 8,604.9                                 | 4.1   | 17.0  | 44.5  | 73.8  | 192.9 | 289.4 | 421.9   | 565.8   | 715.9   | 765.4   | 1,779.3 | 2,187.3 | 1,114.7 | 432.9 |
| Poetimber                        | 5,541.3                                 | -     | 20.1  | 54.2  | 79.6  | 162.4 | 219.1 | 334.1   | 420.9   | 454.7   | 593.4   | 1,021.3 | 1,194.7 | 648.3   | 338.5 |
| Sapling and seedling             | 4,431.2                                 | 514.7 | 488.2 | 445.6 | 525.7 | 554.0 | 472.4 | 475.0   | 331.4   | 231.6   | 167.5   | 144.6   | 60.9    | 16.8    | 2.8   |
| Nonstocked                       | 38.5                                    | 36.4  | 2.1   | -     | -     | -     | -     | -       | -       | -       | -       | -       | -       | -       | -     |
| All stands                       | 18,615.9                                | 555.2 | 527.4 | 544.3 | 679.1 | 909.3 | 980.9 | 1,231.0 | 1,318.1 | 1,402.2 | 1,526.3 | 2,945.2 | 3,442.9 | 1,779.8 | 774.2 |

Table 39. -- Area of timberland by stocking class based on selected stand components  
and Forest Survey Unit, Michigan, 1993

(In thousand acres)

| Stocking class (percent)        | Stocking classified in terms of: |                     |             |              |
|---------------------------------|----------------------------------|---------------------|-------------|--------------|
|                                 | All live trees                   | Growing-stock trees | Rough trees | Rotten trees |
| <b>Eastern Upper Peninsula</b>  |                                  |                     |             |              |
| 0-10                            | 3.5                              | 7.3                 | 2,385.8     | 3,267.1      |
| 11-20                           | 8.7                              | 9.3                 | 795.1       | 383.0        |
| 21-30                           | 8.5                              | 19.2                | 381.6       | 97.4         |
| 31-40                           | 27.2                             | 34.2                | 145.4       | 41.8         |
| 41-50                           | 15.7                             | 24.9                | 50.3        | 14.6         |
| 51-60                           | 37.9                             | 55.3                | 19.3        | 5.0          |
| 61-70                           | 46.6                             | 84.5                | 14.8        | -            |
| 71-80                           | 51.0                             | 107.8               | 11.8        | -            |
| 81-90                           | 84.2                             | 199.6               | -           | -            |
| 91-100                          | 105.5                            | 271.0               | 1.2         | -            |
| 101-110                         | 164.9                            | 427.2               | 2.5         | -            |
| 111-120                         | 372.8                            | 566.3               | -           | -            |
| 121-130                         | 563.8                            | 584.6               | -           | -            |
| 131-140                         | 681.7                            | 536.5               | 1.1         | -            |
| 141-150                         | 574.6                            | 424.6               | -           | -            |
| 151-160                         | 456.0                            | 323.1               | -           | -            |
| 161+                            | 606.3                            | 133.5               | -           | -            |
| All classes                     | 3,808.9                          | 3,808.9             | 3,808.9     | 3,808.9      |
| <b>Western Upper Peninsula</b>  |                                  |                     |             |              |
| 0-10                            | 3.3                              | 13.3                | 2,395.4     | 3,672.8      |
| 11-20                           | 5.0                              | 10.3                | 1,169.4     | 622.8        |
| 21-30                           | 7.2                              | 16.7                | 516.5       | 200.6        |
| 31-40                           | 7.1                              | 35.2                | 292.5       | 64.6         |
| 41-50                           | 17.8                             | 38.7                | 116.8       | 21.2         |
| 51-60                           | 24.5                             | 59.2                | 50.1        | 6.2          |
| 61-70                           | 34.2                             | 67.7                | 13.7        | 1.2          |
| 71-80                           | 42.4                             | 120.9               | 12.4        | -            |
| 81-90                           | 48.1                             | 208.0               | 12.8        | -            |
| 91-100                          | 64.0                             | 343.8               | 4.9         | -            |
| 101-110                         | 159.9                            | 509.7               | 1.6         | -            |
| 111-120                         | 346.3                            | 684.9               | 1.7         | -            |
| 121-130                         | 639.3                            | 781.9               | 1.6         | -            |
| 131-140                         | 901.9                            | 738.7               | -           | -            |
| 141-150                         | 911.6                            | 513.8               | -           | -            |
| 151-160                         | 625.7                            | 311.4               | -           | -            |
| 161+                            | 751.1                            | 135.2               | -           | -            |
| All classes                     | 4,589.4                          | 4,589.4             | 4,589.4     | 4,589.4      |
| <b>Northern Lower Peninsula</b> |                                  |                     |             |              |
| 0-10                            | 8.4                              | 25.4                | 5,036.2     | 6,705.7      |
| 11-20                           | 15.6                             | 45.2                | 1,359.9     | 411.1        |
| 21-30                           | 46.7                             | 95.9                | 516.7       | 78.3         |
| 31-40                           | 97.0                             | 101.1               | 176.1       | 16.9         |
| 41-50                           | 73.7                             | 117.0               | 53.0        | 1.8          |
| 51-60                           | 109.9                            | 164.8               | 42.7        | 1.2          |
| 61-70                           | 134.9                            | 196.3               | 9.6         | -            |
| 71-80                           | 167.5                            | 267.1               | 14.4        | 1.9          |
| 81-90                           | 228.8                            | 461.9               | 4.3         | -            |
| 91-100                          | 379.2                            | 653.6               | 4.0         | -            |
| 101-110                         | 632.1                            | 986.1               | -           | -            |
| 111-120                         | 1,137.5                          | 1,299.8             | -           | -            |
| 121-130                         | 1,405.0                          | 1,177.1             | -           | -            |
| 131-140                         | 1,361.8                          | 948.8               | -           | -            |
| 141-150                         | 996.1                            | 478.8               | -           | -            |
| 151-160                         | 349.3                            | 164.4               | -           | -            |
| 161+                            | 73.4                             | 33.6                | -           | -            |
| All classes                     | 7,216.9                          | 7,216.9             | 7,216.9     | 7,216.9      |

(Table 39 continued on next page)

(Table 39 continued)

| Stocking class (percent) | Stocking classified in terms of: |                     |             |              |
|--------------------------|----------------------------------|---------------------|-------------|--------------|
|                          | All live trees                   | Growing-stock trees | Rough trees | Rotten trees |
| Southern Lower Peninsula |                                  |                     |             |              |
| 0-10                     | 6.6                              | 33.0                | 1,618.2     | 2,858.2      |
| 11-20                    | 7.8                              | 37.6                | 736.0       | 120.2        |
| 21-30                    | 33.0                             | 64.6                | 339.3       | 17.4         |
| 31-40                    | 36.0                             | 54.0                | 188.4       | -            |
| 41-50                    | 33.0                             | 123.4               | 60.0        | -            |
| 51-60                    | 94.3                             | 118.0               | 29.2        | 4.9          |
| 61-70                    | 69.4                             | 113.4               | 17.9        | -            |
| 71-80                    | 141.8                            | 193.6               | 2.7         | -            |
| 81-90                    | 124.5                            | 238.0               | 2.6         | -            |
| 91-100                   | 219.0                            | 314.0               | -           | -            |
| 101-110                  | 289.0                            | 425.3               | 3.4         | -            |
| 111-120                  | 436.0                            | 449.4               | -           | -            |
| 121-130                  | 619.8                            | 403.8               | -           | -            |
| 131-140                  | 501.3                            | 281.3               | 3.0         | -            |
| 141-150                  | 302.8                            | 110.5               | -           | -            |
| 151-160                  | 72.3                             | 37.3                | -           | -            |
| 161+                     | 14.1                             | 3.5                 | -           | -            |
| All classes              | 3,000.7                          | 3,000.7             | 3,000.7     | 3,000.7      |
| All Units                |                                  |                     |             |              |
| 0-10                     | 21.8                             | 79.0                | 11,435.6    | 16,503.8     |
| 11-20                    | 37.1                             | 102.4               | 4,060.4     | 1,537.1      |
| 21-30                    | 95.4                             | 196.4               | 1,754.1     | 393.7        |
| 31-40                    | 167.3                            | 224.5               | 802.4       | 123.3        |
| 41-50                    | 140.2                            | 304.0               | 280.1       | 37.6         |
| 51-60                    | 266.6                            | 397.3               | 141.3       | 17.3         |
| 61-70                    | 285.1                            | 461.9               | 56.0        | 1.2          |
| 71-80                    | 402.7                            | 689.4               | 41.3        | 1.9          |
| 81-90                    | 485.6                            | 1,107.5             | 19.7        | -            |
| 91-100                   | 767.7                            | 1,582.4             | 10.1        | -            |
| 101-110                  | 1,245.9                          | 2,348.3             | 7.5         | -            |
| 111-120                  | 2,292.6                          | 3,000.4             | 1.7         | -            |
| 121-130                  | 3,227.9                          | 2,947.4             | 1.6         | -            |
| 131-140                  | 3,446.7                          | 2,505.3             | 4.1         | -            |
| 141-150                  | 2,785.1                          | 1,527.7             | -           | -            |
| 151-160                  | 1,503.3                          | 836.2               | -           | -            |
| 161+                     | 1,444.9                          | 305.8               | -           | -            |
| All classes              | 18,615.9                         | 18,615.9            | 18,615.9    | 18,615.9     |

Table 40. -- Area of timberland in plantations by forest type, stand-age class, and Forest Survey Unit, Michigan, 1993

(In thousand acres)

| Forest Survey<br>Unit and forest type | All classes | Stand-age class (years) |       |       |       |       |       |       |     |   |
|---------------------------------------|-------------|-------------------------|-------|-------|-------|-------|-------|-------|-----|---|
|                                       |             | 1-10                    | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71+ |   |
| Eastern Upper Peninsula               |             |                         |       |       |       |       |       |       |     |   |
| Jack pine                             | 50.4        | 1.8                     | 8.0   | 4.9   | 9.6   | 10.5  | 12.6  | 3.0   | -   | - |
| Red pine                              | 110.0       | 5.5                     | 20.6  | 9.1   | 22.3  | 32.3  | 14.3  | 4.1   | 1.8 | - |
| White pine                            | 3.9         | -                       | 0.9   | -     | -     | -     | 3.0   | -     | -   | - |
| Balsam fir                            | 1.9         | -                       | -     | -     | 1.9   | -     | -     | -     | -   | - |
| White spruce                          | 11.8        | -                       | 4.2   | 7.6   | -     | -     | -     | -     | -   | - |
| Black spruce                          | 1.4         | -                       | -     | -     | 1.4   | -     | -     | -     | -   | - |
| Tamarack                              | 1.2         | 1.2                     | -     | -     | -     | -     | -     | -     | -   | - |
| All types                             | 180.6       | 8.5                     | 33.7  | 21.6  | 35.2  | 42.8  | 29.9  | 7.1   | 1.8 | - |
| Western Upper Peninsula               |             |                         |       |       |       |       |       |       |     |   |
| Jack pine                             | 31.7        | 10.4                    | 3.5   | 2.9   | -     | 6.1   | 7.0   | 1.8   | -   | - |
| Red pine                              | 55.3        | 16.1                    | 11.4  | 4.3   | 10.9  | 10.3  | 1.2   | 1.1   | -   | - |
| Balsam fir                            | 4.6         | -                       | -     | -     | -     | 4.6   | -     | -     | -   | - |
| White spruce                          | 10.2        | -                       | 0.9   | 3.8   | 3.1   | 1.3   | 1.1   | -     | -   | - |
| Black spruce                          | 5.6         | -                       | 2.2   | 3.4   | -     | -     | -     | -     | -   | - |
| All types                             | 107.4       | 26.5                    | 18.0  | 14.4  | 14.0  | 22.3  | 9.3   | 2.9   | -   | - |
| Northern Lower Peninsula              |             |                         |       |       |       |       |       |       |     |   |
| Jack pine                             | 165.0       | 30.2                    | 32.1  | 23.7  | 51.5  | 14.5  | 13.0  | -     | -   | - |
| Red pine                              | 428.0       | 14.7                    | 52.9  | 116.4 | 133.5 | 53.8  | 51.3  | 5.4   | -   | - |
| White pine                            | 16.1        | 1.2                     | 0.5   | 1.9   | 6.4   | 6.1   | -     | -     | -   | - |
| White spruce                          | 11.3        | 2.1                     | 0.6   | 8.6   | -     | -     | -     | -     | -   | - |
| Black spruce                          | 3.6         | -                       | 3.6   | -     | -     | -     | -     | -     | -   | - |
| All types                             | 624.0       | 48.2                    | 89.7  | 150.6 | 191.4 | 74.4  | 64.3  | 5.4   | -   | - |
| Southern Lower Peninsula              |             |                         |       |       |       |       |       |       |     |   |
| Jack pine                             | 21.7        | 0.2                     | 1.1   | 9.7   | 4.2   | -     | 6.5   | -     | -   | - |
| Red pine                              | 29.7        | -                       | -     | 4.8   | 12.9  | 9.4   | -     | 2.6   | -   | - |
| White pine                            | 18.3        | 2.8                     | 0.9   | 10.0  | 2.7   | -     | 1.9   | -     | -   | - |
| White spruce                          | 4.8         | -                       | 3.7   | -     | 1.1   | -     | -     | -     | -   | - |
| Elm-ash-soft maple                    | 0.5         | -                       | -     | -     | -     | 0.5   | -     | -     | -   | - |
| All types                             | 75.0        | 3.0                     | 5.7   | 24.5  | 20.9  | 9.9   | 8.4   | 2.6   | -   | - |
| All units                             |             |                         |       |       |       |       |       |       |     |   |
| Jack pine                             | 268.8       | 42.6                    | 44.7  | 41.2  | 65.3  | 31.1  | 39.1  | 4.8   | -   | - |
| Red pine                              | 623.0       | 36.3                    | 84.9  | 134.6 | 179.6 | 105.8 | 66.8  | 13.2  | 1.8 | - |
| White pine                            | 38.3        | 4.0                     | 2.3   | 11.9  | 9.1   | 6.1   | 4.9   | -     | -   | - |
| Balsam fir                            | 6.5         | -                       | -     | -     | 1.9   | 4.6   | -     | -     | -   | - |
| White spruce                          | 38.1        | 2.1                     | 9.4   | 20.0  | 4.2   | 1.3   | 1.1   | -     | -   | - |
| Black spruce                          | 10.6        | -                       | 5.8   | 3.4   | 1.4   | -     | -     | -     | -   | - |
| Tamarack                              | 1.2         | 1.2                     | -     | -     | -     | -     | -     | -     | -   | - |
| Elm-ash-soft maple                    | 0.5         | -                       | -     | -     | -     | 0.5   | -     | -     | -   | - |
| All types                             | 987.0       | 86.2                    | 147.1 | 211.1 | 261.5 | 149.4 | 111.9 | 18.0  | 1.8 | - |

Table 41. -- Area of reserved forest land by ownership class and  
Forest Survey Unit, Michigan, 1993

(In thousand acres)

| Ownership class      | All Units | Forest Survey Unit         |                            |                             |                             |
|----------------------|-----------|----------------------------|----------------------------|-----------------------------|-----------------------------|
|                      |           | Eastern Upper<br>Peninsula | Western Upper<br>Peninsula | Northern Lower<br>Peninsula | Southern Lower<br>Peninsula |
| National forest      | 129.6     | 46.1                       | 49.3                       | 34.2                        | -                           |
| Other federal        | 200.6     | 43.1                       | 111.3                      | 46.2                        | -                           |
| State                | 182.1     | 29.2                       | 67.5                       | 38.4                        | 47.0                        |
| County and municipal | 7.4       | 0.2                        | 0.5                        | 1.1                         | 5.6                         |
| Individual           | 50.1      | 2.3                        | -                          | 47.8                        | -                           |
| Corporate            | 4.9       | -                          | 1.0                        | 3.5                         | 0.4                         |
| All ownerships       | 574.7     | 120.9                      | 229.6                      | 171.2                       | 53.0                        |

Table 42. -- Area of reserved forest land by forest type and  
Forest Survey Unit, Michigan, 1993

(In thousand acres)

| Forest type          | All Units | Forest Survey Unit         |                            |                             |                             |
|----------------------|-----------|----------------------------|----------------------------|-----------------------------|-----------------------------|
|                      |           | Eastern Upper<br>Peninsula | Western Upper<br>Peninsula | Northern Lower<br>Peninsula | Southern Lower<br>Peninsula |
| Jack pine            | 38.4      | 9.9                        | -                          | 28.5                        | -                           |
| Red pine             | 21.3      | 3.6                        | 2.0                        | 14.8                        | 0.9                         |
| White pine           | 1.0       | -                          | -                          | 1.0                         | -                           |
| Balsam fir           | 32.1      | 2.0                        | 28.8                       | 1.3                         | -                           |
| White spruce         | 30.8      | 0.9                        | 1.8                        | 28.1                        | -                           |
| Black spruce         | 7.5       | 7.3                        | -                          | 0.2                         | -                           |
| Northern white-cedar | 29.4      | 16.7                       | 6.5                        | 6.2                         | -                           |
| Tamarack             | 2.5       | -                          | 1.0                        | 1.5                         | -                           |
| Oak-hickory          | 29.9      | -                          | -                          | 13.1                        | 16.8                        |
| Elm-ash-soft maple   | 60.2      | 10.0                       | 9.1                        | 16.1                        | 25.0                        |
| Maple-beech-birch    | 190.1     | 59.6                       | 82.6                       | 43.6                        | 4.3                         |
| Aspen                | 121.0     | 5.4                        | 95.4                       | 15.9                        | 4.3                         |
| Paper birch          | 10.5      | 5.5                        | 2.4                        | 0.9                         | 1.7                         |
| All types            | 574.7     | 120.9                      | 229.6                      | 171.2                       | 53.0                        |



Table 44. -- Net volume of sawtimber on timberland by species group and Forest Survey Unit, Michigan, 1980 and 1993

(In thousand board feet)<sup>1</sup>

| Species group          | Forest Survey Unit |                    |                         |                   |                         |                   |
|------------------------|--------------------|--------------------|-------------------------|-------------------|-------------------------|-------------------|
|                        | All Units          |                    | Eastern Upper Peninsula |                   | Western Upper Peninsula |                   |
|                        | 1980               | 1993               | 1980                    | 1993              | 1980                    | 1993              |
| <b>Softwoods</b>       |                    |                    |                         |                   |                         |                   |
| Jack pine              | 1,218,263          | 1,474,600          | 314,403                 | 445,135           | 287,854                 | 342,139           |
| Red pine               | 1,953,674          | 4,791,938          | 431,403                 | 1,110,683         | 280,225                 | 566,657           |
| White pine             | 2,752,769          | 3,973,439          | 794,678                 | 1,070,749         | 822,114                 | 1,068,936         |
| White spruce           | 1,407,276          | 1,950,136          | 482,973                 | 615,977           | 789,811                 | 1,122,092         |
| Black spruce           | 391,022            | 508,901            | 155,582                 | 190,646           | 182,111                 | 253,541           |
| Balsam fir             | 1,149,768          | 1,481,028          | 332,789                 | 457,685           | 653,043                 | 772,432           |
| Hemlock                | 2,590,636          | 3,154,012          | 681,186                 | 795,256           | 1,622,658               | 1,908,724         |
| Tamarack               | 214,876            | 430,682            | 75,214                  | 115,412           | 73,732                  | 158,854           |
| Eastern redcedar       | 1,404              | 4,877              | -                       | -                 | -                       | -                 |
| Northern white-cedar   | 3,286,387          | 4,696,896          | 1,210,788               | 1,823,049         | 1,247,261               | 1,605,852         |
| Other softwoods        | 69,079             | 226,052            | 1,944                   | 15,212            | -                       | 3,679             |
| <b>Total softwoods</b> | <b>15,035,154</b>  | <b>22,692,561</b>  | <b>4,480,960</b>        | <b>6,639,804</b>  | <b>5,958,809</b>        | <b>7,802,906</b>  |
| <b>Hardwoods</b>       |                    |                    |                         |                   |                         |                   |
| Select white oak       | 1,644,156          | 2,659,883          | 475                     | 2,354             | 6,187                   | 2,739             |
| Select red oak         | 3,219,102          | 5,513,432          | 55,913                  | 103,325           | 265,663                 | 371,090           |
| Other red oak          | 779,793            | 1,320,026          | -                       | -                 | -                       | -                 |
| Select hickory         | 158,676            | 271,408            | -                       | -                 | -                       | -                 |
| Other hickory          | 124,278            | 178,167            | -                       | 1,138             | -                       | -                 |
| Basswood               | 1,558,535          | 2,504,525          | 104,618                 | 178,562           | 456,734                 | 780,922           |
| Beech                  | 1,190,303          | 1,676,951          | 603,354                 | 736,242           | 745                     | 1,124             |
| Yellow birch           | 1,577,031          | 1,473,171          | 412,795                 | 341,800           | 1,073,396               | 983,766           |
| Hard maple             | 6,234,704          | 9,282,920          | 1,158,761               | 1,705,093         | 3,558,811               | 4,685,546         |
| Soft maple             | 4,502,929          | 7,708,538          | 902,741                 | 1,263,087         | 1,101,197               | 1,560,360         |
| Elm                    | 526,028            | 431,468            | 79,205                  | 20,731            | 357,221                 | 115,494           |
| Black ash              | 317,160            | 475,217            | 39,321                  | 60,825            | 179,183                 | 201,125           |
| White and green ash    | 1,033,479          | 2,214,657          | 37,141                  | 96,002            | 65,679                  | 123,980           |
| Sycamore               | 70,556             | 107,688            | -                       | -                 | -                       | -                 |
| Cottonwood             | 228,738            | 520,161            | 1,506                   | 2,442             | -                       | -                 |
| Willow                 | 116,196            | 157,770            | 508                     | 485               | -                       | 1,856             |
| Hackberry              | 2,581              | 7,544              | -                       | -                 | -                       | -                 |
| Balsam poplar          | 791,288            | 977,493            | 298,740                 | 371,222           | 153,042                 | 183,199           |
| Bigtooth aspen         | 1,770,435          | 3,293,765          | 101,708                 | 187,674           | 236,631                 | 433,431           |
| Quaking aspen          | 2,965,374          | 4,736,558          | 493,733                 | 906,866           | 1,209,762               | 1,819,235         |
| Paper birch            | 869,234            | 1,209,190          | 290,892                 | 354,886           | 345,000                 | 450,175           |
| Tupelo                 | 5,871              | 11,271             | -                       | -                 | -                       | -                 |
| Black cherry           | 595,142            | 1,087,087          | 69,786                  | 123,830           | 60,757                  | 106,161           |
| Black walnut           | 98,058             | 160,994            | -                       | -                 | -                       | -                 |
| Butternut              | 16,754             | 27,239             | -                       | 2,543             | -                       | -                 |
| Yellow-poplar          | 80,815             | 162,735            | -                       | -                 | -                       | -                 |
| Sassafras              | 27,536             | 69,742             | -                       | -                 | -                       | -                 |
| Other hardwoods        | 9,117              | 39,053             | 501                     | 546               | 790                     | -                 |
| <b>Total hardwoods</b> | <b>30,513,869</b>  | <b>48,278,653</b>  | <b>4,651,698</b>        | <b>6,459,653</b>  | <b>9,070,798</b>        | <b>11,820,203</b> |
| <b>All species</b>     | <b>45,549,023</b>  | <b>70,971,214</b>  | <b>9,132,658</b>        | <b>13,099,457</b> | <b>15,029,607</b>       | <b>19,623,109</b> |
| <b>Total</b>           | <b>86,088,092</b>  | <b>119,249,867</b> | <b>13,784,356</b>       | <b>19,558,910</b> | <b>24,059,215</b>       | <b>31,243,212</b> |

<sup>1</sup>International 1/4-inch rule.

Table 45. -- Net volume of all live trees\* on timberland by species group and diameter class, Michigan, 1993

(In thousand cubic feet)

| Species group                      | All classes       | Diameter class (inches at breast height) |                  |                  |                  |                  |                  |                  |                  |                  |                |
|------------------------------------|-------------------|------------------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|----------------|
|                                    |                   | 5.0-6.9                                  | 7.0-8.9          | 9.0-10.9         | 11.0-12.9        | 13.0-14.9        | 15.0-16.9        | 17.0-18.9        | 19.0-20.9        | 21.0-28.9        | 29.0+          |
| <b>Softwoods</b>                   |                   |                                          |                  |                  |                  |                  |                  |                  |                  |                  |                |
| Jack pine                          | 641,910           | 123,148                                  | 194,861          | 163,598          | 101,610          | 37,088           | 15,563           | 5,051            | 691              | 300              | -              |
| Red pine                           | 1,651,454         | 272,966                                  | 451,702          | 328,292          | 221,267          | 141,395          | 89,426           | 65,433           | 41,323           | 39,490           | 160            |
| White pine                         | 923,573           | 54,281                                   | 65,371           | 90,811           | 97,784           | 91,280           | 91,304           | 92,640           | 82,504           | 210,847          | 46,751         |
| White spruce                       | 502,629           | 49,933                                   | 83,213           | 86,159           | 92,158           | 72,659           | 51,598           | 36,876           | 15,348           | 14,074           | 611            |
| Black spruce                       | 371,092           | 154,799                                  | 119,129          | 55,812           | 24,587           | 7,927            | 3,889            | 3,641            | 1,045            | 263              | -              |
| Balsam fir                         | 837,186           | 266,374                                  | 259,035          | 185,107          | 75,938           | 34,698           | 10,496           | 4,001            | 618              | 919              | -              |
| Hemlock                            | 717,756           | 24,508                                   | 40,092           | 72,399           | 93,417           | 106,479          | 114,784          | 87,227           | 61,509           | 105,765          | 11,576         |
| Tamarack                           | 193,704           | 52,116                                   | 51,345           | 38,311           | 25,667           | 13,309           | 7,319            | 3,396            | 1,104            | 749              | 388            |
| Eastern redcedar                   | 3,191             | 1,169                                    | 849              | 626              | 273              | 126              | -                | -                | -                | 148              | -              |
| Northern white-cedar               | 2,099,637         | 459,111                                  | 539,766          | 432,983          | 283,565          | 182,077          | 95,616           | 54,850           | 26,750           | 23,647           | 1,272          |
| Other softwoods                    | 130,416           | 32,644                                   | 42,462           | 33,364           | 14,306           | 4,035            | 2,895            | -                | 710              | -                | -              |
| <b>Total softwoods</b>             | <b>8,072,548</b>  | <b>1,491,049</b>                         | <b>1,847,825</b> | <b>1,487,462</b> | <b>1,030,572</b> | <b>691,073</b>   | <b>482,890</b>   | <b>353,115</b>   | <b>231,602</b>   | <b>396,202</b>   | <b>60,758</b>  |
| <b>Hardwoods</b>                   |                   |                                          |                  |                  |                  |                  |                  |                  |                  |                  |                |
| Select white oak                   | 901,191           | 58,511                                   | 81,322           | 113,772          | 106,670          | 113,030          | 100,256          | 87,996           | 61,998           | 128,232          | 49,404         |
| Other white oak                    | 1,030             | 71                                       | 178              | 781              | -                | -                | -                | -                | -                | -                | -              |
| Select red oak                     | 1,722,858         | 70,968                                   | 131,159          | 217,527          | 264,112          | 264,505          | 202,094          | 165,568          | 137,569          | 227,554          | 41,802         |
| Other red oak                      | 437,471           | 25,376                                   | 37,537           | 57,577           | 61,750           | 58,689           | 62,242           | 44,746           | 34,658           | 42,989           | 11,907         |
| Select hickory                     | 97,902            | 4,681                                    | 7,904            | 15,299           | 17,745           | 19,513           | 13,460           | 8,319            | 4,640            | 6,099            | 242            |
| Other hickory                      | 68,088            | 4,480                                    | 7,246            | 10,402           | 15,229           | 11,044           | 7,392            | 6,913            | 2,854            | 2,528            | -              |
| Basswood                           | 954,390           | 56,847                                   | 129,841          | 182,116          | 206,077          | 145,045          | 98,840           | 58,379           | 33,427           | 39,684           | 4,134          |
| Beech                              | 577,168           | 39,151                                   | 50,753           | 67,427           | 66,023           | 71,237           | 79,804           | 64,242           | 44,143           | 84,514           | 9,874          |
| Yellow birch                       | 641,782           | 61,602                                   | 79,724           | 94,595           | 87,849           | 80,204           | 78,603           | 55,116           | 35,173           | 61,156           | 7,760          |
| Hard maple                         | 4,430,789         | 606,112                                  | 752,254          | 787,540          | 652,777          | 485,602          | 391,919          | 290,927          | 179,264          | 248,892          | 35,502         |
| Soft maple                         | 3,851,515         | 489,584                                  | 674,759          | 709,609          | 581,506          | 434,999          | 326,067          | 223,611          | 133,671          | 215,049          | 62,660         |
| Elm                                | 314,444           | 58,908                                   | 66,457           | 68,883           | 46,054           | 28,844           | 20,376           | 11,233           | 4,502            | 8,984            | 203            |
| Black ash                          | 370,072           | 100,843                                  | 93,871           | 64,655           | 45,150           | 34,577           | 15,672           | 8,130            | 3,484            | 3,690            | -              |
| White and green ash                | 859,970           | 86,040                                   | 126,447          | 129,638          | 128,647          | 115,114          | 98,422           | 71,543           | 36,954           | 55,391           | 11,774         |
| Sycamore                           | 24,108            | 396                                      | 149              | 1,678            | 2,191            | 1,822            | 712              | 3,428            | 754              | 8,157            | 4,821          |
| Cottonwood                         | 135,725           | 3,398                                    | 6,066            | 8,482            | 12,418           | 15,086           | 19,449           | 15,943           | 9,855            | 27,758           | 17,270         |
| Willow                             | 63,071            | 2,655                                    | 3,638            | 4,881            | 5,821            | 5,704            | 9,370            | 4,774            | 5,632            | 14,113           | 6,483          |
| Hackberry                          | 4,628             | 1,647                                    | 788              | 492              | 177              | 342              | 354              | 828              | -                | -                | -              |
| Balsam poplar                      | 362,014           | 31,907                                   | 42,900           | 65,001           | 53,847           | 51,342           | 41,599           | 27,575           | 19,115           | 27,029           | 1,699          |
| Bigtooth aspen                     | 1,302,513         | 104,457                                  | 173,615          | 254,039          | 283,797          | 235,520          | 129,371          | 64,363           | 32,140           | 24,463           | 748            |
| Quaking aspen                      | 2,180,606         | 242,274                                  | 326,209          | 424,998          | 422,012          | 313,236          | 222,161          | 129,760          | 50,198           | 48,820           | 938            |
| Paper birch                        | 930,559           | 156,295                                  | 222,402          | 230,365          | 157,885          | 86,530           | 42,074           | 19,878           | 7,435            | 7,226            | 469            |
| Tupelo                             | 8,202             | 2,453                                    | 1,356            | 1,315            | 461              | 1,282            | -                | -                | -                | 1,335            | -              |
| Black cherry                       | 640,072           | 77,258                                   | 116,837          | 130,221          | 103,287          | 87,649           | 51,235           | 36,287           | 16,210           | 19,959           | 1,129          |
| Black walnut                       | 60,059            | 4,489                                    | 7,167            | 10,167           | 9,759            | 9,215            | 5,680            | 5,350            | 3,279            | 4,193            | 760            |
| Butternut                          | 11,060            | 457                                      | 1,752            | 1,495            | 2,795            | 1,672            | 1,148            | 528              | 237              | 976              | -              |
| Yellow-poplar                      | 39,416            | 1,261                                    | 947              | 2,996            | 4,674            | 4,432            | 6,073            | 3,034            | 6,996            | 8,139            | 864            |
| Sassafras                          | 62,280            | 13,552                                   | 17,308           | 11,760           | 9,543            | 5,810            | 2,780            | 1,152            | -                | 375              | -              |
| Other hardwoods                    | 48,110            | 9,756                                    | 11,864           | 8,771            | 8,051            | 3,755            | 3,378            | 697              | 1,068            | 626              | 144            |
| Noncommercial species <sup>1</sup> | 109,443           | 47,958                                   | 30,775           | 18,333           | 6,945            | 2,869            | 520              | 143              | 458              | 1,138            | 304            |
| <b>Total hardwoods</b>             | <b>21,210,536</b> | <b>2,363,387</b>                         | <b>3,203,225</b> | <b>3,694,815</b> | <b>3,363,252</b> | <b>2,688,669</b> | <b>2,031,051</b> | <b>1,410,463</b> | <b>865,714</b>   | <b>1,319,069</b> | <b>270,891</b> |
| <b>All species</b>                 | <b>29,283,084</b> | <b>3,854,436</b>                         | <b>5,051,050</b> | <b>5,182,277</b> | <b>4,393,824</b> | <b>3,379,742</b> | <b>2,513,941</b> | <b>1,763,578</b> | <b>1,097,316</b> | <b>1,715,271</b> | <b>331,649</b> |

<sup>1</sup> Net volume of all live trees 5 inches d.b.h. and larger from a 1-foot stump to a 4-inch top diameter outside bark.

Table 46. -- Net volume of tree species on timberland by major tree class and individual species, Michigan, 1993

| Major tree class       |                |                     |           |           |         |                                  |            |           |
|------------------------|----------------|---------------------|-----------|-----------|---------|----------------------------------|------------|-----------|
| Species group          | Total all live | All live trees      |           |           |         | Saw-log size trees               |            |           |
|                        |                | Growing stock       | Short-log | Rough     | Rotten  | Total saw-log size trees         | Sawtimber  | Short-log |
|                        |                | Thousand cubic feet |           |           |         | Thousand board feet <sup>1</sup> |            |           |
| Softwoods              |                |                     |           |           |         |                                  |            |           |
| Jack pine              | 641,910        | 603,319             | 5,699     | 31,561    | 1,331   | 1,493,542                        | 1,474,600  | 18,942    |
| Red pine               | 1,651,454      | 1,626,692           | 4,068     | 20,369    | 325     | 4,806,986                        | 4,791,938  | 15,048    |
| White pine             | 923,573        | 869,620             | 16,002    | 34,397    | 3,554   | 4,027,280                        | 3,973,439  | 53,841    |
| White spruce           | 502,629        | 494,221             | 2,027     | 5,838     | 543     | 1,960,150                        | 1,950,136  | 10,014    |
| Black spruce           | 371,092        | 365,055             | 271       | 5,482     | 284     | 509,760                          | 508,901    | 859       |
| Balsam fir             | 837,186        | 822,551             | 2,829     | 9,891     | 1,915   | 1,489,239                        | 1,481,028  | 8,211     |
| Hemlock                | 717,756        | 661,724             | 19,337    | 25,112    | 11,583  | 3,208,842                        | 3,154,012  | 54,830    |
| Tamarack               | 193,704        | 180,922             | 1,812     | 9,063     | 1,907   | 438,122                          | 430,682    | 7,440     |
| Eastern redcedar       | 3,191          | 2,931               | 161       | 99        | -       | 5,604                            | 4,877      | 727       |
| Northern white-cedar   | 2,099,637      | 1,832,717           | 45,798    | 142,542   | 78,580  | 4,857,691                        | 4,696,896  | 160,795   |
| Norway spruce          | 6,211          | 6,147               | -         | 64        | -       | 9,899                            | 9,899      | -         |
| Engelmann spruce       | 122            | 122                 | -         | -         | -       | -                                | -          | -         |
| Blue spruce            | 1,082          | 1,082               | -         | -         | -       | 2,001                            | 2,001      | -         |
| Scotch pine            | 102,668        | 87,082              | 1,769     | 13,817    | -       | 182,966                          | 175,292    | 7,674     |
| Austrian pine          | 19,323         | 16,875              | -         | 2,448     | -       | 38,434                           | 38,434     | -         |
| Douglas fir            | 1,010          | 1,010               | -         | -         | -       | 426                              | 426        | -         |
| Total softwoods        | 8,072,548      | 7,572,070           | 99,773    | 300,683   | 100,022 | 23,030,942                       | 22,692,561 | 338,381   |
| Hardwoods              |                |                     |           |           |         |                                  |            |           |
| White oak              | 797,261        | 726,362             | 26,046    | 41,118    | 3,735   | 2,361,849                        | 2,296,944  | 64,905    |
| Swamp white oak        | 69,072         | 63,893              | 1,752     | 3,351     | 76      | 255,242                          | 250,980    | 4,262     |
| Bur oak                | 33,565         | 28,018              | 2,213     | 3,062     | 272     | 117,702                          | 111,959    | 5,743     |
| Chinkapin oak          | 1,293          | 1,293               | -         | -         | -       | -                                | -          | -         |
| Chestnut oak           | 1,030          | 644                 | -         | 386       | -       | -                                | -          | -         |
| Northern red oak       | 1,722,858      | 1,604,647           | 43,204    | 65,284    | 9,723   | 5,606,054                        | 5,513,432  | 92,622    |
| Scarlet oak            | 2,321          | 2,321               | -         | -         | -       | 8,488                            | 8,488      | -         |
| Northern pin oak       | 76,767         | 70,485              | 1,643     | 4,327     | 312     | 220,349                          | 216,718    | 3,631     |
| Pin oak                | 7,503          | 7,300               | -         | 165       | 38      | 23,688                           | 23,688     | -         |
| Black oak              | 350,880        | 317,498             | 12,765    | 18,440    | 2,177   | 1,099,941                        | 1,071,132  | 28,809    |
| Shellbark hickory      | 5,355          | 5,355               | -         | -         | -       | 20,108                           | 20,108     | -         |
| Shagbark hickory       | 78,769         | 73,526              | 659       | 4,584     | -       | 201,393                          | 199,883    | 1,510     |
| Mockernut hickory      | 13,778         | 13,778              | -         | -         | -       | 51,417                           | 51,417     | -         |
| Bittemut hickory       | 53,172         | 50,329              | 1,166     | 1,542     | 135     | 129,277                          | 126,332    | 2,945     |
| Pignut hickory         | 14,916         | 14,791              | -         | 125       | -       | 51,835                           | 51,835     | -         |
| American basswood      | 954,390        | 903,635             | 12,337    | 27,685    | 10,733  | 2,529,268                        | 2,504,525  | 24,743    |
| Beech                  | 577,168        | 477,377             | 24,980    | 42,590    | 32,221  | 1,742,687                        | 1,676,951  | 65,736    |
| Yellow birch           | 641,782        | 498,381             | 37,615    | 70,221    | 35,565  | 1,563,446                        | 1,473,171  | 90,275    |
| Black maple            | 1,805          | 1,278               | -         | 204       | 323     | 5,643                            | 5,643      | -         |
| Sugar maple            | 4,428,984      | 4,041,462           | 87,974    | 245,481   | 54,067  | 9,474,359                        | 9,277,277  | 197,082   |
| Red maple              | 3,572,549      | 3,194,638           | 90,874    | 230,719   | 56,318  | 7,038,240                        | 6,807,511  | 230,729   |
| Silver maple           | 278,966        | 257,596             | 7,521     | 10,435    | 3,414   | 921,493                          | 901,027    | 20,466    |
| American elm           | 277,940        | 248,644             | 6,024     | 22,359    | 913     | 404,273                          | 389,583    | 14,690    |
| Siberian elm           | 376            | 350                 | -         | -         | 26      | 936                              | 936        | -         |
| Slippery elm           | 26,586         | 24,809              | -         | 1,460     | 317     | 22,846                           | 22,846     | -         |
| Rock elm               | 9,542          | 8,300               | 302       | 529       | 411     | 18,879                           | 18,103     | 776       |
| Black ash              | 370,072        | 338,088             | 2,103     | 25,352    | 4,529   | 479,886                          | 475,217    | 4,669     |
| White ash              | 600,877        | 571,583             | 13,212    | 13,059    | 3,023   | 1,746,976                        | 1,718,167  | 28,809    |
| Green ash              | 259,093        | 242,492             | 5,642     | 9,800     | 1,159   | 508,127                          | 496,490    | 11,637    |
| Sycamore               | 24,108         | 23,004              | -         | 1,015     | 89      | 107,688                          | 107,688    | -         |
| Eastern cottonwood     | 135,725        | 131,894             | 994       | 2,044     | 793     | 523,468                          | 520,161    | 3,307     |
| Black willow           | 63,071         | 43,316              | 4,420     | 12,700    | 2,635   | 172,444                          | 157,770    | 14,674    |
| Hackberry              | 4,628          | 4,628               | -         | -         | -       | 7,544                            | 7,544      | -         |
| Balsam poplar          | 362,014        | 345,096             | 1,842     | 8,565     | 6,511   | 981,851                          | 977,493    | 4,358     |
| Bigtooth aspen         | 1,302,513      | 1,236,719           | 13,071    | 24,347    | 28,376  | 3,315,729                        | 3,293,765  | 21,964    |
| Quaking aspen          | 2,180,806      | 1,971,082           | 34,440    | 95,311    | 79,773  | 4,809,843                        | 4,736,558  | 73,285    |
| Paper birch            | 930,559        | 844,859             | 16,160    | 58,916    | 10,824  | 1,247,255                        | 1,209,190  | 38,065    |
| River birch            | 74             | 74                  | -         | -         | -       | -                                | -          | -         |
| Tupelo                 | 8,202          | 6,192               | -         | 1,887     | 123     | 11,271                           | 11,271     | -         |
| Black cherry           | 640,072        | 496,151             | 26,555    | 110,483   | 6,883   | 1,146,591                        | 1,087,087  | 59,504    |
| Black walnut           | 60,059         | 54,445              | 1,512     | 4,007     | 95      | 164,845                          | 160,994    | 3,851     |
| Butternut              | 11,060         | 8,718               | 561       | 1,120     | 661     | 28,683                           | 27,239     | 1,444     |
| Yellow-poplar          | 39,416         | 38,756              | 468       | -         | 192     | 163,971                          | 162,735    | 1,236     |
| Boxelder               | 25,351         | 12,864              | 2,585     | 8,960     | 942     | 30,281                           | 23,036     | 7,245     |
| Ohio buckeye           | 377            | 377                 | -         | -         | -       | 1,671                            | 1,671      | -         |
| Sweet birch            | 1,051          | 1,051               | -         | -         | -       | -                                | -          | -         |
| Flowering dogwood      | 2,159          | 1,039               | -         | 1,057     | 63      | -                                | -          | -         |
| Honeylocust            | 2,688          | 2,688               | -         | -         | -       | -                                | -          | -         |
| Red mulberry           | 1,357          | 124                 | 51        | 1,107     | 75      | 136                              | -          | 136       |
| Black locust           | 14,907         | 12,236              | 217       | 2,144     | 310     | 14,990                           | 14,346     | 644       |
| Sassafras              | 62,280         | 48,629              | 588       | 11,413    | 1,650   | 71,472                           | 69,742     | 1,730     |
| Noncommercial species  | 109,589        | -                   | 95        | 107,948   | 1,546   | 242                              | -          | 242       |
| Total hardwoods        | 21,210,536     | 19,072,815          | 481,591   | 1,295,302 | 360,828 | 49,404,377                       | 48,278,653 | 1,125,724 |
| All commercial species | 29,283,084     | 26,644,885          | 581,364   | 1,595,985 | 460,850 | 72,435,319                       | 70,971,214 | 1,464,105 |

<sup>1</sup>International 1/4-inch rule.

Table 47. -- Net volume of noncommercial tree species  
on timberland by individual species, Michigan, 1993

(In thousand cubic feet)

| Noncommercial tree species | Nongrowing-stock volume |
|----------------------------|-------------------------|
| Striped maple              | 2,162                   |
| Mountain maple             | 1,703                   |
| American hornbeam          | 3,183                   |
| Hawthorn                   | 6,300                   |
| Osage-orange               | 240                     |
| Apple                      | 15,172                  |
| Eastern hophornbeam        | 70,005                  |
| Pincherry                  | 5,127                   |
| Chokecherry                | 2,791                   |
| Mountain ash               | 1,036                   |
| Peachleaf willow           | 763                     |
| Diamond willow             | 961                     |
| All noncommercial species  | 109,443                 |

Table 48. -- Net volume of growing stock on timberland by species group and forest type, Michigan, 1993

(In thousand cubic feet)

| Species group        | All types  | Forest type |           |            |            |              |              |                      |          |             |                    |                   |           |             |               | Non-stocked |
|----------------------|------------|-------------|-----------|------------|------------|--------------|--------------|----------------------|----------|-------------|--------------------|-------------------|-----------|-------------|---------------|-------------|
|                      |            | Jack pine   | Red pine  | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-beech-birch | Aspen     | Paper birch | Balsam poplar |             |
| Softwoods            |            |             |           |            |            |              |              |                      |          |             |                    |                   |           |             |               |             |
| Jack pine            | 603,319    | 447,032     | 55,412    | 7,219      | 2,286      | 1,620        | 13,693       | 89                   | 258      | 48,512      | 687                | 9,347             | 14,137    | 2,426       | -             | 601         |
| Red pine             | 1,626,692  | 83,088      | 1,287,035 | 34,483     | 10,183     | 2,536        | 8,405        | 5,174                | 199      | 51,040      | 6,171              | 63,724            | 66,566    | 7,358       | 279           | 451         |
| White pine           | 869,620    | 20,460      | 76,248    | 238,139    | 34,069     | 9,356        | 24,154       | 60,415               | 2,892    | 59,679      | 24,869             | 239,091           | 64,946    | 14,278      | 1,024         | -           |
| White spruce         | 494,221    | 3,648       | 9,290     | 12,586     | 80,240     | 72,953       | 7,939        | 49,661               | 424      | 4,163       | 21,836             | 128,958           | 83,076    | 12,327      | 7,075         | 45          |
| Black spruce         | 365,055    | 6,816       | 3,279     | 7,205      | 33,964     | 4,006        | 166,804      | 83,173               | 8,063    | -           | 11,248             | 18,788            | 16,073    | 3,804       | 1,832         | -           |
| Balsam fir           | 822,551    | 1,819       | 6,938     | 8,576      | 185,317    | 13,008       | 23,405       | 110,320              | 3,049    | 2,039       | 55,643             | 210,794           | 143,787   | 35,049      | 22,807        | -           |
| Hemlock              | 661,724    | -           | 1,881     | 3,318      | 5,567      | 217          | 1,785        | 22,892               | -        | 2,717       | 27,675             | 578,452           | 10,956    | 5,230       | 1,034         | -           |
| Tamarack             | 180,922    | 447         | 929       | 315        | 10,871     | 936          | 26,040       | 49,611               | 61,866   | 295         | 10,809             | 4,904             | 7,643     | 2,815       | 3,441         | -           |
| Eastern redcedar     | 2,931      | -           | -         | -          | -          | -            | -            | -                    | -        | 1,648       | -                  | 1,283             | -         | -           | -             | -           |
| Northern white-cedar | 1,832,717  | 516         | 2,226     | 3,223      | 58,968     | 9,009        | 16,915       | 1,295,152            | 13,008   | 1,788       | 113,035            | 190,522           | 72,371    | 35,271      | 20,713        | -           |
| Other softwoods      | 112,318    | 77,938      | 8,850     | 254        | 926        | 1,363        | 150          | 277                  | -        | 3,303       | 975                | 17,199            | 920       | 163         | -             | -           |
| Total softwoods      | 7,572,070  | 641,764     | 1,452,088 | 315,318    | 422,391    | 115,004      | 289,290      | 1,676,764            | 89,759   | 175,184     | 272,948            | 1,463,062         | 480,475   | 118,721     | 58,205        | 1,097       |
| Hardwoods            |            |             |           |            |            |              |              |                      |          |             |                    |                   |           |             |               |             |
| Select white oak     | 819,566    | 4,205       | 14,052    | 8,139      | -          | -            | -            | 79                   | 34       | 612,351     | 44,489             | 115,527           | 19,078    | 1,612       | -             | -           |
| Other white oak      | 644        | -           | -         | -          | -          | -            | -            | -                    | -        | -           | 644                | -                 | -         | -           | -             | -           |
| Select red oak       | 1,604,647  | 23,034      | 31,287    | 11,300     | 1,526      | 919          | -            | 122                  | 206      | 1,049,942   | 23,247             | 326,712           | 128,559   | 7,423       | 370           | -           |
| Other red oak        | 397,604    | 12,674      | 17,031    | 4,348      | -          | -            | -            | -                    | -        | 306,058     | 8,507              | 38,476            | 10,067    | -           | 443           | -           |
| Select hickory       | 92,659     | 280         | -         | -          | -          | -            | -            | -                    | -        | 53,688      | 2,421              | 36,170            | 100       | -           | -             | -           |
| Other hickory        | 65,120     | 1,415       | 211       | -          | -          | -            | -            | -                    | -        | 32,461      | 1,103              | 29,930            | -         | -           | -             | -           |
| Basswood             | 903,635    | 2,301       | 898       | 192        | 1,220      | 51           | -            | 2,891                | -        | 20,319      | 34,562             | 810,122           | 28,229    | 2,780       | 70            | -           |
| Beech                | 477,377    | -           | 475       | 88         | 461        | -            | -            | -                    | -        | 9,883       | 4,386              | 455,291           | 6,793     | -           | -             | -           |
| Yellow birch         | 498,381    | 154         | -         | 951        | 8,072      | 449          | 203          | 20,449               | 117      | 1,094       | 28,230             | 428,955           | 7,181     | 2,202       | 324           | -           |
| Hard maple           | 4,042,740  | 2,443       | 8,266     | 5,249      | 9,369      | 1,681        | 350          | 9,492                | -        | 24,870      | 23,429             | 3,867,154         | 73,167    | 16,400      | 870           | -           |
| Soft maple           | 3,452,234  | 6,916       | 26,553    | 14,845     | 37,293     | 7,512        | 4,841        | 72,855               | 1,401    | 226,556     | 763,816            | 1,965,397         | 275,211   | 46,629      | 2,409         | -           |
| Elm                  | 282,103    | 420         | 117       | -          | 433        | 412          | -            | 1,760                | 342      | 13,690      | 85,704             | 169,513           | 7,683     | 871         | 1,158         | -           |
| Black ash            | 338,088    | -           | -         | 726        | 6,346      | 476          | 212          | 34,181               | 122      | 3,468       | 180,815            | 88,881            | 14,406    | 2,840       | 5,615         | -           |
| White and green ash  | 814,075    | 593         | 2,029     | 92         | 288        | 116          | -            | 7,031                | 182      | 47,263      | 202,662            | 521,910           | 26,088    | 5,071       | 750           | -           |
| Sycamore             | 23,004     | -           | -         | -          | -          | -            | -            | 474                  | -        | 6,818       | 79,321             | 40,841            | 3,992     | 101         | 170           | -           |
| Cottonwood           | 131,894    | 177         | -         | -          | -          | 134          | -            | -                    | -        | 957         | 30,101             | 11,111            | 526       | 275         | 139           | -           |
| Willow               | 43,316     | -           | 73        | -          | -          | -            | -            | -                    | -        | 858         | 1,620              | 2,150             | -         | -           | -             | -           |
| Hackberry            | 4,628      | -           | -         | -          | -          | -            | -            | -                    | -        | -           | -                  | -                 | -         | -           | -             | -           |
| Balsam poplar        | 345,096    | 3,428       | 792       | 2,376      | 14,707     | 2,939        | 1,709        | 51,153               | 1,210    | 1,157       | 31,280             | 31,848            | 77,103    | 15,971      | 109,423       | -           |
| Bigtooth aspen       | 1,236,719  | 3,712       | 21,464    | 8,428      | 3,987      | 296          | 1,726        | 4,452                | 173      | 177,065     | 19,207             | 263,295           | 715,881   | 15,865      | 1,168         | -           |
| Quaking aspen        | 1,971,082  | 15,922      | 21,666    | 13,752     | 70,019     | 19,170       | 15,921       | 52,803               | 1,438    | 36,392      | 94,778             | 458,639           | 1,106,097 | 43,853      | 20,525        | 107         |
| Paper birch          | 844,859    | 1,915       | 8,289     | 12,347     | 45,304     | 14,288       | 11,213       | 92,477               | 2,582    | 19,073      | 50,997             | 220,389           | 158,413   | 197,352     | 10,220        | -           |
| Tupelo               | 6,192      | -           | -         | -          | -          | -            | -            | -                    | -        | 1,859       | 2,554              | 811               | 537       | 431         | -             | -           |
| Black cherry         | 496,151    | 7,513       | 5,870     | 598        | 4,234      | 993          | 348          | 2,225                | 420      | 73,886      | 23,543             | 350,697           | 24,598    | 834         | 392           | -           |
| Black walnut         | 54,445     | -           | 159       | -          | -          | -            | -            | -                    | -        | 30,781      | 1,326              | 22,179            | -         | -           | -             | -           |
| Butternut            | 8,718      | -           | -         | -          | -          | -            | -            | 485                  | -        | 1,826       | 1,385              | 5,022             | -         | -           | -             | -           |
| Yellow-poplar        | 38,756     | 397         | 81        | -          | -          | -            | -            | -                    | -        | 3,956       | 6,938              | 27,384            | -         | -           | -             | -           |
| Sassafras            | 48,629     | 1,145       | -         | -          | -          | -            | -            | -                    | -        | 15,371      | 787                | 30,993            | 333       | -           | -             | -           |
| Other hardwoods      | 30,453     | -           | 608       | -          | 56         | -            | -            | 176                  | -        | 1,319       | 10,193             | 17,136            | 553       | -           | 412           | -           |
| Total hardwoods      | 19,072,815 | 88,644      | 159,921   | 83,431     | 203,315    | 49,436       | 36,523       | 353,105              | 8,227    | 2,774,075   | 1,773,632          | 10,342,836        | 2,684,595 | 360,510     | 154,458       | 107         |
| All species          | 26,644,885 | 730,408     | 1,612,009 | 398,749    | 625,706    | 164,440      | 325,813      | 2,029,869            | 97,986   | 2,949,259   | 2,046,580          | 11,805,898        | 3,165,070 | 479,231     | 212,663       | 1,204       |

Table 49. -- Net volume of sawtimber on timberland by species group and forest type, Michigan, 1993

(In thousand board feet)<sup>1</sup>

| Species group        | All types  | Forest type  |             |               |               |                 |                 |                         |          |                 |                        |                       |           |                |                  | Non-<br>stocked |
|----------------------|------------|--------------|-------------|---------------|---------------|-----------------|-----------------|-------------------------|----------|-----------------|------------------------|-----------------------|-----------|----------------|------------------|-----------------|
|                      |            | Jack<br>pine | Red<br>pine | White<br>pine | Balsam<br>fir | White<br>spruce | Black<br>spruce | Northern<br>white-cedar | Tamarack | Oak-<br>hickory | Elm-ash-<br>soft maple | Maple-<br>beech-birch | Aspen     | Paper<br>birch | Balsam<br>poplar |                 |
| Softwoods            |            |              |             |               |               |                 |                 |                         |          |                 |                        |                       |           |                |                  |                 |
| Jack pine            | 1,474,600  | 1,078,518    | 128,577     | 18,229        | 6,749         | 4,824           | 38,746          | -                       | 1,278    | 120,431         | 1,543                  | 20,674                | 41,736    | 11,406         | -                | 1,889           |
| Red pine             | 4,791,938  | 296,781      | 3,491,008   | 165,316       | 43,960        | 8,128           | 36,923          | 27,434                  | 1,075    | 177,862         | 30,119                 | 238,814               | 249,252   | 21,384         | 1,514            | 2,368           |
| White pine           | 3,973,439  | 68,570       | 309,777     | 1,062,595     | 176,646       | 44,230          | 117,574         | 315,403                 | 13,867   | 227,554         | 126,179                | 1,130,361             | 306,448   | 68,847         | 5,388            | -               |
| White spruce         | 1,950,136  | 10,561       | 31,498      | 52,314        | 318,674       | 238,609         | 22,504          | 189,615                 | 2,030    | 7,330           | 92,071                 | 561,643               | 346,639   | 50,276         | 26,372           | -               |
| Black spruce         | 508,901    | 6,202        | 3,339       | 10,368        | 70,051        | 7,405           | 154,219         | 150,657                 | 11,868   | -               | 21,884                 | 41,769                | 18,148    | 7,724          | 5,267            | -               |
| Balsam fir           | 1,481,028  | 4,571        | 14,763      | 13,082        | 335,860       | 31,987          | 28,506          | 127,054                 | 2,869    | 3,033           | 89,234                 | 405,161               | 320,164   | 52,808         | 51,936           | -               |
| Hemlock              | 3,154,012  | -            | 8,719       | 13,714        | 24,771        | 1,132           | 7,916           | 103,917                 | -        | 11,019          | 117,824                | 2,799,290             | 39,980    | 22,325         | 3,405            | -               |
| Tamarack             | 430,682    | 733          | 4,070       | 641           | 32,019        | 3,390           | 46,450          | 104,442                 | 145,612  | -               | 36,006                 | 21,212                | 15,221    | 8,982          | 11,904           | -               |
| Eastern redcedar     | 4,877      | -            | -           | -             | -             | -               | -               | -                       | -        | 3,598           | -                      | 1,279                 | -         | -              | -                | -               |
| Northern white-cedar | 4,696,896  | 1,369        | 4,080       | 11,217        | 196,886       | 20,551          | 32,710          | 3,023,906               | 26,464   | 3,180           | 323,736                | 708,012               | 186,416   | 94,399         | 63,970           | -               |
| Other softwoods      | 226,052    | 128,294      | 26,423      | 500           | 1,839         | 3,595           | -               | -                       | -        | 10,625          | 2,585                  | 50,558                | 872       | 761            | -                | -               |
| Total softwoods      | 22,692,561 | 1,595,599    | 4,022,254   | 1,347,976     | 1,207,455     | 363,851         | 485,548         | 4,042,428               | 205,063  | 584,632         | 841,181                | 5,978,773             | 1,524,876 | 338,912        | 169,756          | 4,257           |
| Hardwoods            |            |              |             |               |               |                 |                 |                         |          |                 |                        |                       |           |                |                  |                 |
| Select white oak     | 2,659,883  | 9,101        | 41,292      | 28,053        | -             | -               | -               | -                       | -        | 1,945,551       | 173,798                | 404,216               | 52,696    | 5,176          | -                | -               |
| Select red oak       | 5,513,432  | 55,893       | 114,887     | 35,953        | 3,660         | 533             | -               | -                       | 989      | 3,557,496       | 88,220                 | 1,219,345             | 408,513   | 26,091         | 1,852            | -               |
| Other red oak        | 1,320,026  | 28,231       | 60,814      | 8,105         | -             | -               | -               | -                       | -        | 1,036,293       | 33,108                 | 127,542               | 25,386    | -              | 547              | -               |
| Select hickory       | 271,408    | -            | -           | -             | -             | -               | -               | -                       | -        | 150,396         | 6,909                  | 114,103               | -         | -              | -                | -               |
| Other hickory        | 178,167    | 5,588        | -           | -             | -             | -               | -               | -                       | -        | 89,379          | 2,677                  | 80,523                | -         | -              | -                | -               |
| Basswood             | 2,504,525  | 6,170        | 1,962       | 465           | 3,901         | 264             | -               | 8,441                   | -        | 42,948          | 83,677                 | 2,282,330             | 68,200    | 6,167          | -                | -               |
| Beech                | 1,676,951  | -            | 2,499       | -             | 1,326         | -               | -               | -                       | -        | 28,956          | 17,947                 | 1,615,972             | 10,251    | -              | -                | -               |
| Yellow birch         | 1,473,171  | 784          | -           | 894           | 28,629        | 2,172           | -               | 66,573                  | 549      | 2,602           | 81,867                 | 1,277,457             | 7,447     | 2,627          | 1,570            | -               |
| Hard maple           | 9,282,920  | 3,270        | 16,446      | 7,608         | 16,403        | 994             | -               | 18,883                  | -        | 63,578          | 39,148                 | 9,013,555             | 78,120    | 22,370         | 2,545            | -               |
| Soft maple           | 7,708,538  | 7,161        | 42,577      | 13,481        | 54,716        | 11,336          | 5,980           | 133,184                 | 1,330    | 361,285         | 2,260,157              | 4,372,800             | 385,408   | 72,075         | 7,048            | -               |
| Elm                  | 431,468    | 1,680        | -           | -             | 1,225         | 1,666           | -               | 2,596                   | 471      | 11,282          | 115,916                | 282,675               | 12,607    | 734            | 616              | -               |
| Black ash            | 475,217    | -            | -           | 1,911         | 6,442         | -               | -               | 22,615                  | -        | 978             | 286,146                | 139,030               | 12,311    | 807            | 4,977            | -               |
| White and green ash  | 2,214,657  | 2,661        | 4,970       | 282           | -             | 278             | -               | 12,954                  | -        | 139,342         | 518,530                | 1,475,355             | 51,248    | 7,794          | 1,243            | -               |
| Sycamore             | 107,888    | -            | -           | -             | -             | -               | -               | -                       | -        | 5,861           | 74,984                 | 26,843                | -         | -              | 845              | -               |
| Cottonwood           | 520,161    | 693          | -           | -             | -             | -               | -               | 2,256                   | -        | 29,541          | 299,673                | 173,027               | 14,126    | -              | -                | -               |
| Willow               | 157,770    | -            | -           | -             | -             | 679             | -               | -                       | -        | 2,396           | 106,532                | 45,474                | 1,291     | 1,398          | -                | -               |
| Hackberry            | 7,544      | -            | -           | -             | -             | -               | -               | -                       | -        | -               | 4,681                  | 2,863                 | -         | -              | -                | -               |
| Balsam poplar        | 977,493    | 8,442        | 1,748       | 11,136        | 34,627        | 10,108          | 2,730           | 153,705                 | 1,601    | 3,675           | 85,344                 | 107,909               | 226,550   | 42,727         | 287,191          | -               |
| Bigtooth aspen       | 3,293,765  | 5,563        | 44,993      | 21,419        | 11,381        | 1,262           | 4,168           | 11,543                  | 773      | 428,199         | 43,540                 | 801,795               | 1,860,017 | 56,755         | 2,357            | -               |
| Quaking aspen        | 4,736,558  | 21,332       | 25,839      | 27,239        | 127,290       | 31,060          | 20,742          | 150,481                 | 1,547    | 57,524          | 241,485                | 1,295,002             | 2,546,674 | 135,818        | 54,525           | -               |
| Paper birch          | 1,209,190  | 2,637        | 11,054      | 19,711        | 61,786        | 14,653          | 18,267          | 115,394                 | 2,641    | 17,088          | 90,576                 | 422,054               | 204,202   | 215,261        | 13,866           | -               |
| Tupelo               | 11,271     | -            | -           | -             | -             | -               | -               | -                       | -        | 2,033           | 7,352                  | -                     | -         | 1,886          | -                | -               |
| Black cherry         | 1,087,087  | 7,943        | 4,958       | 252           | 2,221         | 1,716           | -               | 3,052                   | 702      | 180,021         | 45,691                 | 803,284               | 35,920    | 491            | 836              | -               |
| Black walnut         | 160,994    | -            | 675         | -             | -             | -               | -               | -                       | -        | 102,634         | 5,428                  | 52,257                | -         | -              | -                | -               |
| Butternut            | 27,239     | -            | -           | -             | -             | -               | -               | 2,470                   | -        | 5,719           | 3,433                  | 15,617                | -         | -              | -                | -               |
| Yellow-poplar        | 162,735    | 1,946        | -           | -             | -             | -               | -               | -                       | -        | 19,258          | 28,911                 | 112,620               | -         | -              | -                | -               |
| Sassafras            | 69,742     | -            | -           | -             | -             | -               | -               | -                       | -        | 20,132          | 1,042                  | 47,908                | 660       | -              | -                | -               |
| Other hardwoods      | 39,053     | -            | -           | -             | -             | -               | -               | -                       | -        | 1,936           | 19,463                 | 17,654                | -         | -              | -                | -               |
| Total hardwoods      | 48,278,653 | 169,095      | 374,714     | 176,509       | 353,607       | 76,721          | 51,887          | 704,147                 | 10,603   | 8,306,103       | 4,766,235              | 26,329,210            | 5,981,627 | 598,177        | 380,018          | -               |
| All species          | 70,971,214 | 1,764,694    | 4,396,968   | 1,524,485     | 1,561,062     | 440,572         | 537,435         | 4,746,575               | 215,666  | 8,870,735       | 5,607,416              | 32,307,983            | 7,506,503 | 937,089        | 549,774          | 4,257           |

International 1/4-inch rule.

<sup>1</sup> International 1/4-inch rule.



Table 51. --- Net volume of sawtimber on timberland by species group and ownership class, Michigan, 1993

(In thousand board feet)<sup>1</sup>

| Species group          | Total             | Ownership class  |                |                   |                    |               |                  | Forest industry   | Individual | Corporate        |
|------------------------|-------------------|------------------|----------------|-------------------|--------------------|---------------|------------------|-------------------|------------|------------------|
|                        |                   | National forest  | Other federal  | State             | County & municipal | Indian        |                  |                   |            |                  |
| <b>Softwoods</b>       |                   |                  |                |                   |                    |               |                  |                   |            |                  |
| Jack pine              | 1,474,600         | 329,170          | 30,228         | 638,896           | 41,869             | -             | 23,110           | 314,123           |            | 97,204           |
| Red pine               | 4,791,938         | 1,696,907        | 23,511         | 1,586,360         | 93,129             | -             | 32,113           | 1,077,592         |            | 282,326          |
| White pine             | 3,973,439         | 627,846          | 3,046          | 958,132           | 59,332             | -             | 276,658          | 1,442,263         |            | 606,162          |
| White spruce           | 1,950,136         | 330,928          | 15,742         | 361,859           | 12,936             | 1,479         | 307,438          | 577,543           |            | 342,211          |
| Black spruce           | 508,901           | 97,698           | 668            | 152,664           | 9,038              | -             | 74,503           | 111,141           |            | 63,189           |
| Balsam fir             | 1,481,028         | 160,580          | 14,338         | 317,227           | 10,561             | 552           | 198,592          | 535,000           |            | 244,178          |
| Hemlock                | 3,154,012         | 577,885          | 7,568          | 333,677           | 37,667             | 11,134        | 726,416          | 888,856           |            | 570,809          |
| Tamarack               | 430,682           | 62,225           | -              | 91,627            | 13,904             | -             | 42,901           | 169,948           |            | 50,077           |
| Eastern redcedar       | 4,877             | -                | -              | -                 | -                  | -             | -                | 4,877             |            | -                |
| Northern white-cedar   | 4,696,896         | 582,635          | 2,922          | 1,161,075         | 35,833             | 2,858         | 891,879          | 1,484,037         |            | 535,657          |
| Other softwoods        | 226,052           | 3,099            | -              | 5,345             | 14,950             | -             | -                | 187,829           |            | 14,829           |
| <b>Total softwoods</b> | <b>22,692,561</b> | <b>4,468,973</b> | <b>98,023</b>  | <b>5,606,862</b>  | <b>329,219</b>     | <b>16,023</b> | <b>2,573,610</b> | <b>6,793,209</b>  |            | <b>2,806,642</b> |
| <b>Hardwoods</b>       |                   |                  |                |                   |                    |               |                  |                   |            |                  |
| Select white oak       | 2,659,883         | 239,384          | -              | 347,019           | 79,765             | -             | 13,468           | 1,743,528         |            | 236,719          |
| Select red oak         | 5,513,432         | 470,833          | 6,180          | 1,066,598         | 87,570             | -             | 86,267           | 3,209,322         |            | 586,662          |
| Other red oak          | 1,320,026         | 254,210          | -              | 167,051           | 20,938             | -             | -                | 806,637           |            | 71,190           |
| Select hickory         | 271,408           | -                | -              | 12,367            | 7,954              | -             | -                | 210,831           |            | 40,256           |
| Other hickory          | 178,167           | -                | -              | 9,995             | 741                | -             | -                | 156,701           |            | 10,730           |
| Basswood               | 2,504,525         | 245,923          | -              | 473,188           | 15,527             | 6,603         | 171,389          | 1,327,956         |            | 263,939          |
| Beech                  | 1,676,951         | 199,464          | 18,026         | 162,257           | 22,012             | -             | 147,220          | 875,288           |            | 252,684          |
| Yellow birch           | 1,473,171         | 264,321          | 8,139          | 158,335           | 13,463             | 10,951        | 418,774          | 366,954           |            | 232,234          |
| Hard maple             | 9,282,920         | 1,155,947        | 14,063         | 995,542           | 116,427            | 17,131        | 1,902,909        | 3,636,668         |            | 1,444,233        |
| Soft maple             | 7,708,538         | 848,423          | 7,158          | 975,700           | 120,569            | 5,257         | 664,698          | 4,281,620         |            | 805,113          |
| Elm                    | 431,468           | 6,632            | 1,031          | 41,940            | 10,773             | -             | 27,883           | 281,828           |            | 61,381           |
| Black ash              | 475,217           | 63,266           | -              | 58,744            | 11,272             | 578           | 68,286           | 186,153           |            | 86,918           |
| White & green ash      | 2,214,657         | 64,519           | 1,411          | 191,610           | 41,259             | -             | 41,934           | 1,615,063         |            | 258,861          |
| Sycamore               | 107,688           | -                | -              | -                 | -                  | -             | -                | 106,108           |            | 1,580            |
| Cottonwood             | 520,161           | -                | -              | 20,089            | 16,657             | -             | -                | 439,465           |            | 43,950           |
| Willow                 | 157,770           | -                | -              | 11,475            | 3,217              | -             | -                | 134,214           |            | 8,864            |
| Hackberry              | 7,544             | -                | -              | -                 | -                  | -             | -                | 7,544             |            | -                |
| Balsam poplar          | 977,493           | 56,790           | -              | 197,792           | 18,269             | 1,497         | 63,346           | 541,335           |            | 98,464           |
| Bigtooth aspen         | 3,293,765         | 250,507          | 10,397         | 690,293           | 29,108             | 1,538         | 26,288           | 1,877,019         |            | 408,615          |
| Quaking aspen          | 4,736,558         | 524,819          | 32,986         | 931,445           | 48,885             | 7,051         | 324,599          | 2,279,935         |            | 586,838          |
| Paper birch            | 1,209,190         | 101,486          | 4,850          | 290,374           | 6,976              | -             | 144,927          | 484,749           |            | 175,828          |
| Tupelo                 | 11,271            | -                | -              | 1,886             | -                  | -             | -                | 9,385             |            | -                |
| Black cherry           | 1,087,087         | 101,668          | 1,983          | 119,646           | 18,841             | -             | 42,928           | 695,422           |            | 106,599          |
| Black walnut           | 160,994           | -                | -              | 7,330             | -                  | -             | -                | 149,023           |            | 4,641            |
| Butternut              | 27,239            | 1,000            | -              | -                 | -                  | -             | -                | 23,993            |            | 2,246            |
| Yellow-poplar          | 162,735           | -                | -              | 8,595             | 1,779              | -             | -                | 149,697           |            | 2,664            |
| Sassafras              | 69,742            | -                | -              | 7,307             | -                  | -             | -                | 58,544            |            | 3,891            |
| Other hardwoods        | 39,053            | -                | 546            | -                 | 6,498              | -             | -                | 32,009            |            | -                |
| <b>Total hardwoods</b> | <b>48,278,653</b> | <b>4,849,192</b> | <b>106,770</b> | <b>6,946,578</b>  | <b>698,500</b>     | <b>50,606</b> | <b>4,144,916</b> | <b>25,686,991</b> |            | <b>5,795,100</b> |
| <b>All species</b>     | <b>70,971,214</b> | <b>9,318,165</b> | <b>204,793</b> | <b>12,553,440</b> | <b>1,027,719</b>   | <b>66,629</b> | <b>6,718,526</b> | <b>32,480,200</b> |            | <b>8,601,742</b> |

<sup>1</sup> International 1/4-inch rule.

Table 52. - Net volume of growing stock on timberland by forest type, stand-age class, and Forest Survey Unit, Michigan, 1993

(In thousand cubic feet)

| Forest Survey           |             | Stand-age class (years) |         |         |         |         |           |           |         |         |         |         |         |         |  |
|-------------------------|-------------|-------------------------|---------|---------|---------|---------|-----------|-----------|---------|---------|---------|---------|---------|---------|--|
| Unit and forest type    | All classes | 1-10                    | 11-20   | 21-30   | 31-40   | 41-50   | 51-60     | 61-70     | 71-80   | 81-90   | 91-100  | 101-120 | 121-140 | 141+    |  |
| Eastern Upper Peninsula |             |                         |         |         |         |         |           |           |         |         |         |         |         |         |  |
| Jack pine               | 204,313     | 112                     | 1,748   | 9,232   | 26,456  | 42,276  | 61,482    | 31,101    | 15,250  | 12,313  | 1,521   | 2,822   | -       | -       |  |
| Red pine                | 246,987     | -                       | 7,595   | 14,871  | 45,461  | 76,875  | 48,262    | 21,896    | 5,857   | 14,455  | 3,527   | 1,203   | 6,985   | -       |  |
| White pine              | 120,185     | -                       | 4,695   | 1,658   | 723     | 6,530   | 22,475    | 24,819    | 6,905   | 3,993   | 1,204   | 19,042  | 14,311  | 13,830  |  |
| Balsam fir              | 220,831     | 7,012                   | 23,063  | 17,064  | 14,041  | 39,124  | 54,830    | 32,009    | 13,592  | 3,389   | 3,314   | 12,057  | 1,306   | -       |  |
| White spruce            | 66,381      | 544                     | 4,969   | 9,112   | 1,927   | 13,058  | 14,429    | 14,588    | 3,129   | 2,597   | 2,028   | -       | -       | -       |  |
| Black spruce            | 148,485     | -                       | 5,167   | 24,059  | 25,346  | 23,508  | 20,739    | 20,722    | 9,656   | 7,597   | 4,035   | 4,956   | 2,700   | -       |  |
| Northern white-cedar    | 899,785     | 2,462                   | 4,671   | 11,487  | 46,742  | 56,691  | 90,191    | 108,122   | 104,190 | 116,519 | 67,570  | 124,321 | 77,437  | 89,382  |  |
| Tamarack                | 28,044      | 970                     | 605     | 1,693   | 1,097   | 5,214   | 2,367     | 4,260     | 1,644   | 7,531   | 1,663   | -       | 1,000   | -       |  |
| Oak-hickory             | 36,540      | -                       | 10,716  | 1,628   | 1,410   | 5,889   | 5,396     | 3,054     | 3,899   | 749     | 1,299   | 2,500   | -       | -       |  |
| Elm-ash-soft maple      | 268,784     | 3,394                   | 14,345  | 7,750   | 8,740   | 36,828  | 44,996    | 30,845    | 25,186  | 20,392  | 5,677   | 22,944  | 36,142  | 11,555  |  |
| Maple-beech-birch       | 2,097,400   | 25,435                  | 55,103  | 32,780  | 84,817  | 183,999 | 284,343   | 305,607   | 200,024 | 201,010 | 219,210 | 208,676 | 192,632 | 103,764 |  |
| Aspen                   | 517,196     | 19,580                  | 33,097  | 25,634  | 23,796  | 61,207  | 115,026   | 122,656   | 58,213  | 19,326  | 19,017  | 17,612  | 2,032   | -       |  |
| Paper birch             | 132,357     | -                       | 1,438   | 6,335   | 1,470   | 7,283   | 33,032    | 30,141    | 30,563  | 3,869   | 4,592   | 6,780   | 6,854   | -       |  |
| Balsam poplar           | 116,411     | 3,068                   | 5,917   | 8,286   | 4,827   | 17,530  | 27,100    | 15,478    | 9,309   | 1,197   | 8,524   | 8,879   | 6,296   | -       |  |
| Nonstocked              | 289         | 133                     | 156     | -       | -       | -       | -         | -         | -       | -       | -       | -       | -       | -       |  |
| All types               | 5,103,988   | 62,710                  | 173,315 | 171,589 | 286,853 | 576,012 | 824,668   | 765,298   | 487,417 | 414,927 | 343,181 | 431,792 | 347,695 | 218,531 |  |
| Western Upper Peninsula |             |                         |         |         |         |         |           |           |         |         |         |         |         |         |  |
| Jack pine               | 98,487      | 551                     | 2,377   | 4,019   | 3,901   | 15,256  | 31,853    | 22,429    | 7,652   | 1,889   | 2,363   | 2,404   | 3,793   | -       |  |
| Red pine                | 153,957     | -                       | 4,756   | 8,690   | 37,011  | 37,574  | 4,560     | 7,438     | -       | 19,285  | 14,764  | 16,526  | 3,353   | -       |  |
| White pine              | 93,409      | 1,486                   | 128     | 524     | -       | 2,629   | 5,085     | 7,119     | 7,729   | 16,998  | 30,854  | 16,438  | -       | 4,419   |  |
| Balsam fir              | 337,938     | 2,940                   | 18,358  | 12,711  | 38,796  | 38,603  | 76,770    | 42,232    | 33,329  | 27,862  | 27,202  | 10,861  | 5,416   | 2,858   |  |
| White spruce            | 73,366      | 40                      | 592     | 7,127   | 8,504   | 9,809   | 7,304     | 12,261    | 10,378  | 7,277   | 6,719   | 3,355   | -       | -       |  |
| Black spruce            | 163,391     | 1,899                   | 10,606  | 17,978  | 21,266  | 13,411  | 19,753    | 33,719    | 27,208  | 13,180  | 1,446   | -       | 2,925   | -       |  |
| Northern white-cedar    | 444,710     | -                       | 2,419   | 5,050   | 5,109   | 23,452  | 31,130    | 39,717    | 47,452  | 54,495  | 43,197  | 75,372  | 53,485  | 63,832  |  |
| Tamarack                | 33,965      | 298                     | 3,317   | 2,936   | 348     | 5,274   | 10,801    | 3,877     | 1,685   | 1,060   | -       | 1,563   | 1,145   | 1,661   |  |
| Oak-hickory             | 48,595      | 113                     | 1,733   | 879     | -       | 4,995   | -         | 8,476     | 9,856   | 4,534   | 6,049   | 10,342  | -       | 1,618   |  |
| Elm-ash-soft maple      | 233,681     | 287                     | 7,756   | 8,907   | 11,452  | 17,096  | 19,632    | 40,710    | 25,647  | 16,709  | 14,475  | 19,635  | 19,380  | 31,995  |  |
| Maple-beech-birch       | 4,507,631   | 27,484                  | 93,636  | 59,158  | 128,876 | 365,666 | 644,818   | 644,666   | 317,670 | 416,017 | 415,998 | 585,962 | 476,095 | 331,585 |  |
| Aspen                   | 777,337     | 21,956                  | 47,662  | 42,222  | 48,983  | 112,561 | 194,264   | 151,099   | 74,440  | 41,100  | 24,219  | 4,884   | 13,947  | -       |  |
| Paper birch             | 179,246     | 52                      | 1,003   | 1,207   | 2,913   | 17,965  | 43,194    | 45,324    | 40,050  | 9,758   | 4,245   | 4,675   | 3,440   | 5,420   |  |
| Balsam poplar           | 38,253      | 521                     | -       | 1,380   | 2,980   | 9,325   | 3,054     | 5,609     | 6,445   | 2,814   | 1,754   | 4,371   | -       | -       |  |
| Nonstocked              | 199         | 199                     | -       | -       | -       | -       | -         | -         | -       | -       | -       | -       | -       | -       |  |
| All types               | 7,184,165   | 57,826                  | 194,343 | 172,788 | 310,139 | 673,616 | 1,092,218 | 1,064,676 | 609,541 | 632,978 | 593,285 | 756,388 | 582,979 | 443,388 |  |

Table 52 continued on next page)

(Table 52 continued on next page)

(Table 52 continued)

| Forest Survey<br>Unit and forest type | All classes | Stand-age class (years) |         |           |           |           |           |           |           |           |           |           |           |         |
|---------------------------------------|-------------|-------------------------|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---------|
|                                       |             | 1-10                    | 11-20   | 21-30     | 31-40     | 41-50     | 51-60     | 61-70     | 71-80     | 81-90     | 91-100    | 101-120   | 121-140   | 141+    |
| Northern Lower Peninsula              |             |                         |         |           |           |           |           |           |           |           |           |           |           |         |
| Jack pine                             | 379,827     | 2,471                   | 16,204  | 45,796    | 97,265    | 71,730    | 70,191    | 42,660    | 11,895    | 20,002    | 1,613     | -         | -         | -       |
| Red pine                              | 1,120,647   | 2,804                   | 35,433  | 201,363   | 399,840   | 175,742   | 149,201   | 27,542    | 19,684    | 23,633    | 49,957    | 18,736    | 16,712    | -       |
| White pine                            | 155,621     | 96                      | 1,082   | 6,804     | 22,621    | 11,605    | 9,050     | 26,046    | 17,432    | 8,127     | 17,050    | 29,797    | 1,513     | 4,398   |
| Balsam fir                            | 66,937      | -                       | 3,582   | 12,105    | 5,049     | 1,588     | 6,140     | 17,521    | 11,972    | -         | 3,206     | -         | -         | 5,774   |
| White spruce                          | 18,043      | 301                     | 309     | 9,224     | -         | -         | 1,764     | 778       | 3,274     | -         | -         | -         | -         | 2,393   |
| Black spruce                          | 13,937      | -                       | 2,665   | 1,254     | 384       | 1,835     | -         | 6,227     | -         | -         | 1,572     | -         | -         | -       |
| Northern white-cedar                  | 680,037     | 177                     | 3,629   | 7,159     | 18,824    | 21,352    | 45,968    | 90,060    | 110,570   | 96,358    | 61,741    | 97,280    | 72,990    | 53,929  |
| Tamarack                              | 31,253      | -                       | 2,018   | 5,127     | 3,689     | 7,299     | -         | 8,961     | -         | 522       | 1,098     | 2,081     | 458       | -       |
| Oak-hickory                           | 1,566,664   | 15,678                  | 38,112  | 34,914    | 60,656    | 100,138   | 248,844   | 289,101   | 231,489   | 143,087   | 125,324   | 150,500   | 99,115    | 29,706  |
| Elm-ash-soft maple                    | 674,108     | 8,130                   | 37,410  | 38,739    | 46,673    | 123,002   | 81,337    | 69,390    | 76,881    | 58,171    | 43,928    | 62,864    | 12,114    | 12,114  |
| Maple-beech-birch                     | 3,444,326   | 32,162                  | 108,868 | 102,429   | 151,103   | 363,233   | 701,903   | 617,675   | 385,879   | 239,302   | 325,469   | 219,439   | 148,278   | 48,586  |
| Aspen                                 | 1,748,603   | 34,495                  | 78,627  | 152,290   | 123,937   | 273,367   | 282,284   | 313,450   | 210,054   | 131,569   | 71,945    | 43,827    | 25,369    | 7,389   |
| Paper birch                           | 167,339     | 73                      | 1,500   | 2,003     | 8,332     | 16,536    | 38,625    | 25,731    | 33,107    | 25,886    | -         | 3,954     | 11,592    | -       |
| Balsam poplar                         | 53,668      | 663                     | 7,496   | 528       | 2,452     | -         | 12,865    | 10,460    | 5,826     | 1,974     | 5,908     | -         | -         | 5,496   |
| Nonstocked                            | 716         | 551                     | 165     | -         | -         | -         | -         | -         | -         | -         | -         | -         | -         | -       |
| All types                             | 10,121,726  | 97,601                  | 337,100 | 619,735   | 940,825   | 1,167,427 | 1,648,172 | 1,545,602 | 1,118,063 | 748,631   | 708,811   | 628,478   | 391,496   | 169,785 |
| Southern Lower Peninsula              |             |                         |         |           |           |           |           |           |           |           |           |           |           |         |
| Jack pine                             | 47,781      | 79                      | 1,220   | 14,533    | 8,070     | 7,196     | 12,419    | -         | 4,264     | -         | -         | -         | -         | -       |
| Red pine                              | 90,418      | -                       | -       | 6,113     | 40,986    | 28,043    | 6,148     | 9,128     | -         | -         | -         | -         | -         | -       |
| White pine                            | 29,534      | -                       | 2,013   | 9,917     | 3,658     | -         | 3,322     | -         | 10,624    | -         | -         | -         | -         | -       |
| White spruce                          | 6,650       | -                       | -       | 3,450     | 3,200     | -         | -         | -         | -         | -         | -         | -         | -         | -       |
| Northern white-cedar                  | 5,337       | -                       | -       | -         | 2,912     | -         | -         | -         | 2,425     | -         | -         | -         | -         | -       |
| Tamarack                              | 4,724       | -                       | -       | 1,069     | 170       | 3,485     | -         | -         | -         | -         | -         | -         | -         | -       |
| Oak-hickory                           | 1,297,460   | 4,938                   | 30,547  | 24,457    | 32,532    | 82,665    | 105,677   | 134,710   | 192,198   | 200,466   | 168,754   | 167,453   | 144,679   | 8,384   |
| Elm-ash-soft maple                    | 870,007     | 5,773                   | 63,023  | 41,390    | 72,389    | 111,183   | 108,701   | 170,070   | 67,358    | 28,696    | 72,632    | 110,630   | 18,162    | -       |
| Maple-beech-birch                     | 1,756,541   | 29,297                  | 73,323  | 148,888   | 177,492   | 241,795   | 183,856   | 161,152   | 230,643   | 134,628   | 166,986   | 154,846   | 42,256    | 11,379  |
| Aspen                                 | 121,934     | 897                     | 34,264  | 35,592    | 10,975    | 3,456     | -         | 26,046    | 3,365     | -         | -         | -         | -         | 7,339   |
| Paper birch                           | 289         | -                       | 289     | -         | -         | -         | -         | -         | -         | -         | -         | -         | -         | -       |
| Balsam poplar                         | 4,331       | -                       | -       | 736       | -         | 2,398     | -         | 1,197     | -         | -         | -         | -         | -         | -       |
| Nonstocked                            | -           | -                       | -       | -         | -         | -         | -         | -         | -         | -         | -         | -         | -         | -       |
| All types                             | 4,235,006   | 40,984                  | 204,679 | 286,145   | 352,384   | 480,221   | 420,123   | 502,303   | 510,877   | 363,790   | 408,372   | 432,929   | 205,097   | 27,102  |
| All units                             |             |                         |         |           |           |           |           |           |           |           |           |           |           |         |
| Jack pine                             | 730,408     | 3,213                   | 21,549  | 73,580    | 135,692   | 136,458   | 175,945   | 96,190    | 39,061    | 34,204    | 5,497     | 5,226     | 3,793     | -       |
| Red pine                              | 1,612,009   | 2,804                   | 47,784  | 231,037   | 523,298   | 318,234   | 208,171   | 66,004    | 25,541    | 57,373    | 68,248    | 36,465    | 27,050    | -       |
| White pine                            | 398,749     | 1,582                   | 7,918   | 18,903    | 27,002    | 20,764    | 39,932    | 57,984    | 42,690    | 29,118    | 49,108    | 65,277    | 15,824    | 22,647  |
| Balsam fir                            | 625,706     | 9,952                   | 45,033  | 41,880    | 57,886    | 79,315    | 137,740   | 91,762    | 58,893    | 31,251    | 33,722    | 22,918    | 6,722     | 8,632   |
| White spruce                          | 164,440     | 885                     | 5,870   | 28,913    | 13,631    | 22,867    | 23,497    | 27,627    | 16,781    | 9,874     | 8,747     | 3,355     | -         | 2,393   |
| Black spruce                          | 325,813     | 1,899                   | 18,438  | 43,291    | 46,996    | 38,754    | 40,492    | 60,668    | 36,864    | 20,777    | 7,053     | 4,956     | 5,625     | -       |
| Northern white-cedar                  | 2,029,869   | 2,639                   | 10,719  | 23,696    | 73,587    | 101,495   | 167,289   | 237,899   | 264,637   | 267,372   | 172,508   | 296,973   | 203,912   | 207,143 |
| Tamarack                              | 97,986      | 1,268                   | 5,940   | 10,825    | 5,304     | 21,272    | 13,168    | 17,098    | 3,329     | 9,113     | 2,761     | 3,644     | 2,603     | 1,661   |
| Oak-hickory                           | 2,949,259   | 20,729                  | 81,108  | 61,878    | 94,598    | 193,687   | 359,917   | 435,341   | 437,442   | 348,836   | 301,426   | 330,795   | 243,794   | 39,708  |
| Elm-ash-soft maple                    | 2,046,580   | 17,584                  | 122,534 | 96,786    | 139,254   | 288,109   | 254,666   | 311,015   | 195,072   | 123,958   | 136,712   | 216,073   | 89,153    | 55,664  |
| Maple-beech-birch                     | 11,805,898  | 114,378                 | 330,930 | 343,255   | 542,288   | 1,154,693 | 1,814,920 | 1,729,100 | 1,134,216 | 990,957   | 1,127,663 | 1,168,923 | 859,261   | 495,314 |
| Aspen                                 | 3,165,070   | 76,928                  | 193,650 | 255,738   | 207,691   | 450,591   | 591,574   | 613,251   | 346,072   | 191,995   | 115,181   | 66,323    | 41,348    | 14,728  |
| Paper birch                           | 479,231     | 125                     | 4,230   | 9,545     | 12,715    | 41,784    | 114,851   | 101,196   | 103,720   | 39,513    | 8,837     | 15,409    | 21,886    | 5,420   |
| Balsam poplar                         | 212,663     | 4,252                   | 13,413  | 10,930    | 10,259    | 29,253    | 43,019    | 32,744    | 21,580    | 5,985     | 16,186    | 13,250    | 6,296     | 5,496   |
| Nonstocked                            | 1,204       | 883                     | 321     | -         | -         | -         | -         | -         | -         | -         | -         | -         | -         | -       |
| All types                             | 26,644,885  | 259,121                 | 909,437 | 1,250,257 | 1,890,201 | 2,897,276 | 3,985,181 | 3,877,879 | 2,725,898 | 2,160,326 | 2,053,649 | 2,249,587 | 1,527,267 | 858,806 |

Table 53. -- Net volume of sawtimber on timberland by forest type, stand-age class, and Forest Survey Unit, Michigan, 1993

| (In thousand board feet)           |             |                         |         |         |         |           |           |           |           |           |           |           |           |           |
|------------------------------------|-------------|-------------------------|---------|---------|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Forest Survey Unit and forest type | All classes | Stand-age class (years) |         |         |         |           |           |           |           |           |           |           |           |           |
|                                    |             | 1-10                    | 11-20   | 21-30   | 31-40   | 41-50     | 51-60     | 61-70     | 71-80     | 81-90     | 91-100    | 101-120   | 121-140   | 141+      |
| Eastern Upper Peninsula            |             |                         |         |         |         |           |           |           |           |           |           |           |           |           |
| Jack pine                          | 536,221     | 326                     | 2,448   | 24,448  | 71,878  | 102,673   | 119,819   | 90,039    | 62,982    | 43,521    | 7,427     | 10,660    | -         | -         |
| Red pine                           | 926,868     | -                       | 28,068  | 16,725  | 122,991 | 297,515   | 220,144   | 101,256   | 24,966    | 66,929    | 16,940    | 5,766     | 25,568    | -         |
| White pine                         | 472,730     | -                       | 15,241  | 7,619   | 2,184   | 23,173    | 69,920    | 99,891    | 23,113    | 16,106    | 4,587     | 86,813    | 56,448    | 67,635    |
| Balsam fir                         | 504,926     | 19,095                  | 51,586  | 32,953  | 27,560  | 71,321    | 119,437   | 74,830    | 31,231    | 13,505    | 12,640    | 44,852    | 5,916     | -         |
| White spruce                       | 175,439     | 1,678                   | 3,855   | 14,811  | 5,745   | 30,552    | 35,872    | 53,176    | 11,484    | 8,237     | 10,029    | -         | -         | -         |
| Black spruce                       | 246,883     | -                       | 8,485   | 45,063  | 33,605  | 44,396    | 29,081    | 37,063    | 14,446    | 17,607    | 3,763     | 13,374    | -         | -         |
| Northern white-cedar               | 1,999,179   | 7,709                   | 7,284   | 21,663  | 79,225  | 65,336    | 163,116   | 196,475   | 197,867   | 211,361   | 172,520   | 352,236   | 254,089   | 270,298   |
| Tamarack                           | 49,071      | 1,302                   | 1,690   | 2,087   | 1,737   | -         | 7,227     | 5,391     | -         | 22,772    | 4,726     | -         | 2,139     | -         |
| Oak-hickory                        | 81,380      | -                       | 19,142  | 3,147   | 1,665   | 7,120     | 11,927    | 10,454    | 11,261    | 2,798     | 5,087     | 8,779     | -         | -         |
| Elm-ash-soft maple                 | 646,919     | 8,399                   | 31,283  | 6,933   | 11,644  | 63,713    | 80,999    | 72,251    | 55,345    | 57,067    | 20,440    | 67,537    | 130,551   | 40,757    |
| Maple-birch                        | 5,747,112   | 52,141                  | 93,043  | 55,786  | 135,838 | 390,310   | 607,820   | 678,458   | 562,796   | 611,436   | 725,521   | 720,656   | 677,746   | 434,561   |
| Aspen                              | 1,173,267   | 31,617                  | 52,783  | 44,420  | 40,669  | 111,850   | 252,775   | 276,060   | 171,401   | 65,436    | 60,923    | 58,914    | 6,419     | -         |
| Paper birch                        | 231,856     | -                       | 2,025   | 7,979   | 2,466   | 7,956     | 48,920    | 52,612    | 53,821    | 5,804     | 8,751     | 21,214    | 20,308    | -         |
| Balsam poplar                      | 306,780     | 8,325                   | 8,407   | 12,162  | 7,455   | 32,591    | 74,052    | 40,685    | 26,871    | 4,910     | 34,232    | 33,395    | 23,695    | -         |
| Nonstocked                         | 826         | -                       | 826     | -       | -       | -         | -         | -         | -         | -         | -         | -         | -         | -         |
| All types                          | 13,099,457  | 130,592                 | 326,166 | 295,796 | 544,662 | 1,248,506 | 1,841,109 | 1,789,641 | 1,247,584 | 1,147,489 | 1,087,586 | 1,424,196 | 1,202,879 | 813,251   |
| Western Upper Peninsula            |             |                         |         |         |         |           |           |           |           |           |           |           |           |           |
| Jack pine                          | 320,035     | 840                     | 1,196   | 7,219   | 15,268  | 41,800    | 102,066   | 93,571    | 22,770    | 8,704     | 3,977     | 9,326     | 13,298    | -         |
| Red pine                           | 529,390     | -                       | 3,719   | 19,558  | 108,016 | 116,070   | 17,217    | 23,914    | -         | 87,593    | 67,884    | 69,973    | 15,446    | -         |
| White pine                         | 368,418     | 4,863                   | -       | 2,966   | -       | 10,732    | 13,184    | 24,577    | 26,631    | 69,820    | 126,475   | 71,648    | 17,522    | -         |
| Balsam fir                         | 902,672     | 9,046                   | 43,039  | 24,121  | 73,927  | 76,687    | 208,885   | 114,192   | 104,135   | 89,230    | 90,106    | 39,959    | 19,071    | 10,274    |
| White spruce                       | 211,392     | -                       | 946     | 12,491  | 17,193  | 23,480    | 22,102    | 29,186    | 36,933    | 29,660    | 26,188    | 13,213    | -         | -         |
| Black spruce                       | 268,693     | 5,101                   | 14,104  | 16,355  | 24,308  | 22,875    | 26,526    | 59,131    | 57,153    | 25,272    | 5,586     | -         | 12,282    | -         |
| Northern white-cedar               | 1,262,540   | -                       | 7,217   | 10,700  | 10,189  | 39,016    | 56,738    | 92,163    | 104,317   | 138,782   | 123,823   | 283,174   | 174,704   | 221,717   |
| Tamarack                           | 78,458      | -                       | 8,398   | 3,216   | 426     | 11,090    | 24,058    | 12,054    | 3,296     | -         | -         | 4,240     | 4,318     | 7,362     |
| Oak-hickory                        | 136,448     | 409                     | 4,756   | 874     | -       | 5,844     | -         | 22,304    | 24,846    | 13,551    | 17,003    | 42,869    | 4,318     | 3,992     |
| Elm-ash-soft maple                 | 597,248     | 1,062                   | 12,303  | 12,303  | 14,371  | 32,243    | 39,631    | 95,336    | 59,679    | 47,662    | 49,515    | 66,709    | 64,619    | 103,457   |
| Maple-birch                        | 12,591,959  | 68,083                  | 199,738 | 109,001 | 220,543 | 715,475   | 1,288,754 | 1,451,382 | 843,296   | 1,257,904 | 1,377,309 | 2,024,433 | 1,752,471 | 1,273,570 |
| Aspen                              | 1,915,746   | 63,360                  | 88,266  | 69,299  | 88,880  | 229,408   | 460,900   | 388,696   | 245,907   | 138,712   | 76,823    | 16,514    | 49,181    | -         |
| Paper birch                        | 349,805     | 266                     | 2,554   | 2,390   | 1,471   | 25,687    | 68,273    | 75,817    | 90,539    | 29,466    | 11,975    | 13,559    | 12,975    | 14,833    |
| Balsam poplar                      | 99,854      | 2,271                   | -       | 1,742   | 5,745   | 19,003    | 2,192     | 16,912    | 14,997    | 11,173    | 8,037     | 17,782    | -         | -         |
| Nonstocked                         | 451         | 451                     | -       | -       | -       | -         | -         | -         | -         | -         | -         | -         | -         | -         |
| All types                          | 19,623,109  | 155,752                 | 384,594 | 292,235 | 580,337 | 1,369,410 | 2,330,526 | 2,499,235 | 1,634,499 | 1,947,529 | 1,984,501 | 2,673,399 | 2,118,365 | 1,652,727 |

Table S3 continued on next page

(Table 53 continued on next page)

(Table 53 continued)

| Forest Survey<br>Unit and forest type |            | All classes | Stand-age class (years) |           |           |           |           |           |           |           |           |           |           |           | 141+ |
|---------------------------------------|------------|-------------|-------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------|
|                                       |            |             | 1-10                    | 11-20     | 21-30     | 31-40     | 41-50     | 51-60     | 61-70     | 71-80     | 81-90     | 91-100    | 101-120   | 121-140   |      |
| Northern Lower Peninsula              |            |             |                         |           |           |           |           |           |           |           |           |           |           |           |      |
| Jack pine                             | 809,286    | 1,422       | 26,006                  | 82,374    | 149,790   | 139,540   | 170,931   | 124,245   | 40,964    | 66,136    | 7,878     | -         | -         | -         | -    |
| Red pine                              | 2,643,829  | 7,429       | 33,220                  | 231,469   | 642,411   | 560,414   | 536,921   | 105,549   | 86,774    | 93,141    | 215,185   | 85,285    | 46,031    | -         | -    |
| White pine                            | 592,078    | -           | 4,395                   | 10,956    | 75,037    | 31,479    | 35,312    | 103,791   | 68,232    | 33,167    | 79,435    | 122,698   | 7,211     | 20,365    | -    |
| Balsam fir                            | 153,464    | 659         | 6,522                   | 21,562    | 9,352     | 2,246     | 14,698    | 51,202    | 20,435    | -         | 9,581     | -         | -         | 17,866    | -    |
| White spruce                          | 36,734     | 659         | 1,140                   | 7,555     | -         | -         | 6,892     | 1,407     | 9,513     | -         | -         | -         | -         | 9,568     | -    |
| Black spruce                          | 21,859     | -           | 2,518                   | 3,917     | 810       | 1,752     | -         | 6,189     | -         | -         | 6,673     | -         | -         | -         | -    |
| Northern white-cedar                  | 1,473,268  | 767         | 8,454                   | 14,470    | 29,972    | 24,665    | 96,551    | 149,406   | 174,090   | 178,173   | 161,376   | 260,684   | 223,322   | 151,338   | -    |
| Tamarack                              | 75,765     | -           | 8,639                   | 16,312    | 351       | 10,593    | -         | 27,741    | -         | 2,110     | 3,222     | 5,316     | 1,481     | -         | -    |
| Oak-hickory                           | 4,229,414  | 48,579      | 91,814                  | 63,012    | 113,305   | 221,181   | 562,634   | 662,303   | 620,676   | 442,034   | 395,492   | 542,888   | 345,305   | 120,191   | -    |
| Elm-ash-soft maple                    | 1,720,721  | 8,431       | 57,059                  | 73,583    | 64,746    | 265,183   | 168,893   | 193,766   | 203,918   | 173,630   | 162,865   | 257,316   | 56,157    | 35,174    | -    |
| Maple-birch                           | 8,768,866  | 70,360      | 206,099                 | 175,910   | 295,728   | 754,674   | 1,402,282 | 1,385,332 | 1,130,851 | 783,377   | 1,104,881 | 728,995   | 540,399   | 189,978   | -    |
| Aspen                                 | 4,203,317  | 66,994      | 136,432                 | 180,129   | 191,774   | 637,697   | 639,522   | 804,555   | 649,843   | 412,368   | 230,556   | 137,137   | 91,663    | 24,647    | -    |
| Paper birch                           | 355,428    | -           | 5,473                   | 1,016     | 11,521    | 27,095    | 73,340    | 37,093    | 79,592    | 61,325    | -         | 14,640    | 44,333    | -         | -    |
| Balsam poplar                         | 134,929    | 1,361       | 10,054                  | -         | 3,180     | -         | 30,210    | 22,606    | 17,769    | 7,807     | 21,967    | -         | -         | 19,975    | -    |
| Nonstocked                            | 2,980      | 2,162       | 818                     | -         | -         | -         | -         | -         | -         | -         | -         | -         | -         | -         | -    |
| All types                             | 25,221,938 | 208,164     | 598,643                 | 882,265   | 1,587,977 | 2,676,519 | 3,738,186 | 3,675,185 | 3,102,657 | 2,253,268 | 2,399,111 | 2,154,959 | 1,355,902 | 589,102   | -    |
| Southern Lower Peninsula              |            |             |                         |           |           |           |           |           |           |           |           |           |           |           |      |
| Jack pine                             | 99,152     | 318         | 1,571                   | 19,918    | 14,009    | 14,575    | 34,840    | -         | 13,921    | -         | -         | -         | -         | -         | -    |
| Red pine                              | 296,881    | -           | -                       | 10,170    | 102,837   | 117,805   | 24,026    | 42,043    | -         | -         | -         | -         | -         | -         | -    |
| White pine                            | 91,259     | -           | 5,504                   | 28,049    | 8,345     | -         | 14,472    | -         | 34,889    | -         | -         | -         | -         | -         | -    |
| White spruce                          | 17,007     | -           | -                       | 7,768     | 9,239     | -         | -         | -         | -         | -         | -         | -         | -         | -         | -    |
| Northern white-cedar                  | 11,588     | -           | -                       | -         | 2,411     | -         | -         | -         | 9,177     | -         | -         | -         | -         | -         | -    |
| Tamarack                              | 12,372     | -           | -                       | -         | -         | 12,372    | -         | -         | -         | -         | -         | -         | -         | -         | -    |
| Oak-hickory                           | 4,423,493  | 11,413      | 74,237                  | 42,595    | 77,840    | 201,996   | 242,355   | 450,589   | 656,171   | 737,869   | 684,962   | 630,238   | 575,815   | 37,413    | -    |
| Elm-ash-soft maple                    | 2,642,528  | 7,851       | 126,637                 | 69,596    | 153,856   | 277,793   | 326,507   | 562,437   | 242,418   | 101,061   | 268,551   | 440,947   | 64,874    | -         | -    |
| Maple-birch                           | 5,210,046  | 69,450      | 122,014                 | 256,031   | 359,720   | 584,100   | 536,733   | 533,934   | 775,903   | 538,067   | 596,744   | 612,041   | 183,121   | 42,188    | -    |
| Aspen                                 | 214,173    | 1,091       | 30,326                  | 59,702    | 15,899    | 9,066     | -         | 66,232    | 11,009    | -         | -         | -         | -         | 20,848    | -    |
| Balsam poplar                         | 8,211      | -           | -                       | 979       | -         | 5,806     | -         | 1,426     | -         | -         | -         | -         | -         | -         | -    |
| All types                             | 13,026,710 | 90,123      | 360,289                 | 494,808   | 744,156   | 1,223,513 | 1,178,933 | 1,656,661 | 1,743,488 | 1,376,997 | 1,550,257 | 1,683,226 | 823,810   | 100,449   | -    |
| All units                             |            |             |                         |           |           |           |           |           |           |           |           |           |           |           |      |
| Jack pine                             | 1,764,694  | 2,906       | 31,221                  | 133,959   | 250,945   | 298,598   | 427,656   | 307,855   | 140,637   | 118,361   | 19,282    | 19,986    | 13,298    | -         | -    |
| Red pine                              | 4,396,968  | 7,429       | 65,007                  | 277,922   | 976,255   | 1,091,804 | 798,308   | 272,762   | 111,740   | 247,663   | 300,009   | 161,024   | 87,045    | -         | -    |
| White pine                            | 1,524,485  | 4,863       | 25,140                  | 49,590    | 85,566    | 65,384    | 132,888   | 228,259   | 152,865   | 119,093   | 210,497   | 281,159   | 63,659    | 105,522   | -    |
| Balsam fir                            | 1,561,062  | 28,141      | 101,147                 | 78,636    | 110,839   | 150,254   | 343,020   | 240,224   | 155,801   | 102,735   | 112,327   | 84,811    | 24,987    | 28,140    | -    |
| White spruce                          | 440,572    | 2,337       | 5,941                   | 42,625    | 32,177    | 54,032    | 64,866    | 83,769    | 57,930    | 37,297    | 36,217    | 13,213    | -         | 9,568     | -    |
| Black spruce                          | 537,435    | 5,101       | 25,107                  | 65,335    | 58,723    | 69,023    | 55,607    | 102,383   | 71,599    | 42,879    | 16,022    | 13,374    | 12,282    | -         | -    |
| Northern white-cedar                  | 4,746,575  | 8,476       | 22,955                  | 46,833    | 121,797   | 129,017   | 316,405   | 438,044   | 485,451   | 528,316   | 457,719   | 896,094   | 652,115   | 643,353   | -    |
| Tamarack                              | 215,666    | 1,302       | 18,727                  | 21,615    | 2,514     | 34,055    | 31,285    | 45,186    | 3,296     | 24,882    | 7,948     | 9,556     | 7,938     | 7,362     | -    |
| Oak-hickory                           | 8,870,735  | 60,401      | 189,949                 | 109,628   | 192,810   | 436,141   | 816,916   | 1,145,650 | 1,312,954 | 1,196,252 | 1,102,544 | 1,224,774 | 921,120   | 161,596   | -    |
| Elm-ash-soft maple                    | 5,607,416  | 25,743      | 225,640                 | 162,415   | 244,617   | 638,932   | 616,030   | 923,790   | 561,360   | 379,420   | 501,371   | 832,509   | 316,201   | 179,388   | -    |
| Maple-birch                           | 32,307,983 | 260,034     | 620,894                 | 596,728   | 1,011,829 | 2,444,559 | 3,835,589 | 4,050,106 | 3,312,846 | 3,190,784 | 3,804,455 | 4,086,125 | 3,153,737 | 1,940,297 | -    |
| Aspen                                 | 7,506,503  | 163,062     | 307,807                 | 353,550   | 337,222   | 988,021   | 1,353,197 | 1,535,543 | 1,078,160 | 616,516   | 368,102   | 212,565   | 147,263   | 45,495    | -    |
| Paper birch                           | 937,089    | 266         | 10,052                  | 11,385    | 15,458    | 60,738    | 190,533   | 165,522   | 223,952   | 96,595    | 20,726    | 49,413    | 77,616    | 14,833    | -    |
| Balsam poplar                         | 549,774    | 11,957      | 18,461                  | 14,883    | 16,380    | 57,400    | 106,454   | 81,629    | 59,637    | 23,890    | 64,236    | 51,177    | 23,695    | 19,975    | -    |
| Nonstocked                            | 4,257      | 2,613       | 1,644                   | -         | -         | -         | -         | -         | -         | -         | -         | -         | -         | -         | -    |
| All types                             | 70,971,214 | 584,631     | 1,669,692               | 1,965,104 | 3,457,132 | 6,517,948 | 9,088,754 | 9,620,722 | 7,728,228 | 6,725,283 | 7,021,455 | 7,935,780 | 5,500,956 | 3,155,529 | -    |

\*International 1/4-inch rule.

Table 54. -- Net volume of growing stock on timberland by forest type, basal-area class, and stand-size class, Michigan, 1993

(in thousand cubic feet)

| Forest type and stand-size class |           | Basal-area class (square feet per acre) |       |       |        |        |        |        |        |        |        |         |         |         |         | 181+ |
|----------------------------------|-----------|-----------------------------------------|-------|-------|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|------|
|                                  |           | All classes                             | 0-10  | 11-20 | 21-30  | 31-40  | 41-50  | 51-60  | 61-70  | 71-80  | 81-90  | 91-100  | 101-120 | 121-150 | 151-180 |      |
| Jack pine                        |           |                                         |       |       |        |        |        |        |        |        |        |         |         |         |         |      |
| Sawtimber                        | 333,131   | -                                       | -     | 782   | 5,203  | 15,965 | 32,217 | 32,612 | 31,983 | 39,234 | 45,328 | 46,465  | 56,265  | 13,819  | 13,258  |      |
| Poetimber                        | 358,412   | -                                       | 1,080 | 634   | 4,284  | 10,615 | 17,484 | 39,293 | 36,529 | 36,653 | 44,689 | 65,451  | 79,756  | 13,315  | 8,629   |      |
| Sapling-seedling                 | 38,865    | 944                                     | 2,990 | 4,012 | 6,625  | 6,024  | 2,984  | 4,528  | 7,047  | 1,859  | 716    | 1,136   | -       | -       | -       |      |
| Total                            | 730,408   | 944                                     | 4,070 | 5,428 | 16,112 | 32,604 | 52,685 | 76,433 | 75,559 | 77,746 | 90,733 | 113,052 | 136,021 | 27,134  | 21,887  |      |
| Red pine                         |           |                                         |       |       |        |        |        |        |        |        |        |         |         |         |         |      |
| Sawtimber                        | 947,806   | -                                       | 1,187 | -     | 1,876  | 1,972  | 25,900 | 10,380 | 23,598 | 47,842 | 32,515 | 204,892 | 235,815 | 213,040 | 148,789 |      |
| Poetimber                        | 628,410   | -                                       | 58    | 580   | 187    | 5,500  | 4,774  | 10,306 | 28,505 | 20,495 | 41,938 | 65,776  | 95,206  | 147,356 | 207,729 |      |
| Sapling-seedling                 | 35,793    | 597                                     | 1,446 | 1,323 | 4,841  | 2,059  | 4,187  | -      | 7,007  | 781    | 3,403  | 1,963   | 4,041   | 4,145   | -       |      |
| Total                            | 1,612,009 | 597                                     | 2,691 | 1,903 | 6,904  | 9,531  | 34,861 | 20,686 | 59,110 | 69,118 | 77,856 | 272,631 | 335,062 | 364,541 | 356,518 |      |
| White pine                       |           |                                         |       |       |        |        |        |        |        |        |        |         |         |         |         |      |
| Sawtimber                        | 356,966   | -                                       | -     | 124   | -      | 1,853  | 2,517  | 20,151 | 8,406  | 25,784 | 33,207 | 66,993  | 89,673  | 62,721  | 45,537  |      |
| Poetimber                        | 30,372    | -                                       | -     | -     | 271    | 746    | 723    | 4,465  | 937    | 2,600  | 1,973  | 7,721   | 8,363   | 2,573   | -       |      |
| Sapling-seedling                 | 11,411    | -                                       | 427   | 242   | 1,895  | 2,678  | 581    | 363    | 4,121  | 1,104  | -      | -       | -       | -       | -       |      |
| Total                            | 398,749   | -                                       | 427   | 366   | 2,166  | 5,277  | 3,821  | 24,979 | 13,464 | 29,488 | 35,180 | 74,714  | 98,036  | 65,294  | 45,537  |      |
| Balsam fir                       |           |                                         |       |       |        |        |        |        |        |        |        |         |         |         |         |      |
| Sawtimber                        | 294,272   | -                                       | -     | 1,251 | -      | 1,618  | 5,496  | 9,260  | 10,860 | 25,053 | 21,799 | 46,911  | 96,064  | 58,936  | 17,024  |      |
| Poetimber                        | 224,019   | -                                       | -     | -     | -      | 2,667  | 1,964  | 4,650  | 11,676 | 18,988 | 32,514 | 35,359  | 72,113  | 25,947  | 18,141  |      |
| Sapling-seedling                 | 107,415   | 1,667                                   | 1,581 | 2,499 | 5,315  | 10,860 | 7,759  | 19,849 | 23,776 | 10,961 | 9,075  | 9,775   | 3,290   | 1,008   | -       |      |
| Total                            | 625,706   | 1,667                                   | 1,581 | 3,750 | 5,315  | 15,145 | 15,219 | 33,759 | 46,312 | 55,002 | 63,388 | 92,045  | 171,467 | 85,891  | 35,165  |      |
| White spruce                     |           |                                         |       |       |        |        |        |        |        |        |        |         |         |         |         |      |
| Sawtimber                        | 80,857    | -                                       | -     | -     | -      | 2,071  | 6,560  | 1,538  | 6,096  | 13,265 | 18,418 | 20,753  | 12,156  | -       | -       |      |
| Poetimber                        | 63,302    | -                                       | -     | -     | 778    | -      | -      | -      | 15,627 | 2,635  | 3,982  | 5,530   | 23,288  | 11,462  | -       |      |
| Sapling-seedling                 | 20,281    | 293                                     | 217   | 756   | 598    | 1,075  | 387    | -      | 6,119  | 1,898  | -      | 7,320   | 1,618   | -       | -       |      |
| Total                            | 164,440   | 293                                     | 217   | 756   | 1,376  | 1,075  | 2,458  | 6,560  | 23,284 | 10,629 | 17,247 | 31,268  | 45,659  | 23,618  | -       |      |
| Black spruce                     |           |                                         |       |       |        |        |        |        |        |        |        |         |         |         |         |      |
| Sawtimber                        | 65,648    | -                                       | -     | -     | 650    | 2,566  | 2,873  | 9,595  | 3,212  | 6,840  | 5,345  | 13,288  | 21,279  | -       | -       |      |
| Poetimber                        | 158,715   | -                                       | 207   | 898   | -      | 1,841  | 5,415  | 12,976 | 10,552 | 21,783 | 28,240 | 47,086  | 18,496  | 2,842   | 8,379   |      |
| Sapling-seedling                 | 101,450   | -                                       | 1,652 | 3,532 | 5,601  | 15,000 | 19,020 | 17,289 | 11,438 | 8,643  | 10,520 | 8,755   | -       | -       | -       |      |
| Total                            | 325,813   | -                                       | 1,859 | 4,430 | 6,251  | 19,407 | 27,308 | 39,860 | 25,202 | 37,266 | 44,105 | 69,129  | 39,775  | 2,842   | 8,379   |      |
| Northern white-cedar             |           |                                         |       |       |        |        |        |        |        |        |        |         |         |         |         |      |
| Sawtimber                        | 1,065,800 | -                                       | 293   | 700   | 3,180  | 2,694  | 6,204  | 8,186  | 16,125 | 24,804 | 28,209 | 128,920 | 269,916 | 263,286 | 313,283 |      |
| Poetimber                        | 885,248   | -                                       | -     | -     | 215    | 2,021  | 3,944  | 8,031  | 5,362  | 19,595 | 12,937 | 62,120  | 199,542 | 230,243 | 341,238 |      |
| Sapling-seedling                 | 78,821    | 268                                     | 284   | 296   | 2,461  | 4,132  | 3,222  | 5,737  | 5,420  | 4,390  | 5,048  | 14,597  | 22,752  | 9,017   | 1,197   |      |
| Total                            | 2,029,869 | 268                                     | 577   | 996   | 5,856  | 8,847  | 13,370 | 21,954 | 26,907 | 48,789 | 46,194 | 205,637 | 492,210 | 502,546 | 655,718 |      |
| Tamarack                         |           |                                         |       |       |        |        |        |        |        |        |        |         |         |         |         |      |
| Sawtimber                        | 35,429    | -                                       | 1,293 | 220   | -      | 2,557  | 4,630  | 3,073  | 6,297  | 1,536  | -      | 7,426   | -       | -       | 8,397   |      |
| Poetimber                        | 34,744    | -                                       | -     | -     | 170    | 3,987  | 3,650  | 940    | 3,082  | 5,306  | 3,534  | 4,735   | 9,340   | -       | -       |      |
| Sapling-seedling                 | 27,813    | 494                                     | 2,186 | 2,484 | 3,873  | 1,891  | 3,075  | 2,043  | 1,832  | 3,390  | -      | 5,448   | 1,097   | -       | -       |      |
| Total                            | 97,986    | 494                                     | 3,479 | 2,704 | 4,043  | 8,435  | 11,355 | 6,056  | 11,211 | 10,232 | 3,534  | 17,609  | 10,437  | -       | 8,397   |      |

(Table 54 continued on next page)

(Table 54 continued)

| Forest type and<br>stand-size class | All classes | Basal-area class (square feet per acre) |                     |         |         |         |         |         |           |           |           |           |           |           |           |
|-------------------------------------|-------------|-----------------------------------------|---------------------|---------|---------|---------|---------|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|                                     |             | 0-10                                    | 11-20               | 21-30   | 31-40   | 41-50   | 51-60   | 61-70   | 71-80     | 81-90     | 91-100    | 101-120   | 121-150   | 151-180   | 181+      |
| Oak-hickory                         |             |                                         |                     |         |         |         |         |         |           |           |           |           |           |           |           |
| Sawtimber                           | 2,222,295   | 863                                     | -                   | 2,735   | 3,836   | 17,532  | 33,145  | 98,330  | 160,029   | 209,949   | 209,690   | 631,163   | 537,255   | 295,674   | 22,094    |
| Poetlimber                          | 624,130     | -                                       | 116                 | 121     | 1,456   | 7,643   | 16,720  | 49,937  | 51,845    | 56,995    | 98,028    | 173,068   | 104,883   | 56,449    | 6,869     |
| Sapling-seedling                    | 102,834     | 608                                     | 5,381               | 6,727   | 7,868   | 15,180  | 27,690  | 15,305  | 6,802     | 3,110     | 12,945    | 1,218     | -         | -         | -         |
| Total                               | 2,949,259   | 1,471                                   | 5,497               | 9,583   | 13,160  | 40,355  | 77,555  | 163,572 | 218,676   | 270,054   | 320,663   | 805,449   | 642,138   | 352,123   | 28,963    |
| Elm-ash-soft maple                  |             |                                         |                     |         |         |         |         |         |           |           |           |           |           |           |           |
| Sawtimber                           | 1,341,059   | -                                       | -                   | 6,747   | 13,085  | 44,461  | 23,637  | 31,593  | 62,085    | 71,545    | 101,572   | 298,615   | 364,307   | 234,354   | 89,058    |
| Poetlimber                          | 545,939     | -                                       | 1,468               | 4,975   | 3,768   | 8,743   | 27,815  | 30,369  | 35,759    | 45,083    | 36,274    | 139,249   | 130,520   | 61,825    | 20,091    |
| Sapling-seedling                    | 159,582     | 1,053                                   | 6,910               | 8,302   | 24,629  | 16,422  | 17,570  | 28,409  | 10,346    | 20,069    | 15,097    | 4,712     | 6,063     | -         | -         |
| Total                               | 2,046,580   | 1,053                                   | 8,378               | 20,024  | 41,482  | 69,626  | 69,022  | 90,371  | 108,190   | 136,697   | 152,943   | 442,576   | 500,890   | 296,179   | 109,149   |
| Maple-birch                         |             |                                         |                     |         |         |         |         |         |           |           |           |           |           |           |           |
| Sawtimber                           | 7,927,362   | -                                       | 561                 | 1,380   | 6,197   | 28,736  | 72,750  | 110,850 | 229,618   | 430,366   | 516,505   | 1,516,254 | 2,824,258 | 1,643,025 | 546,862   |
| Poetlimber                          | 3,295,953   | -                                       | 629                 | 1,876   | 14,040  | 13,326  | 42,771  | 50,760  | 118,156   | 186,742   | 317,271   | 621,027   | 1,082,408 | 664,412   | 182,535   |
| Sapling-seedling                    | 582,583     | 1,797                                   | 13,639              | 22,079  | 37,503  | 77,783  | 75,956  | 113,151 | 91,286    | 62,170    | 56,642    | 28,059    | 2,518     | -         | -         |
| Total                               | 11,805,898  | 1,797                                   | 14,829              | 25,335  | 57,740  | 119,845 | 191,477 | 274,761 | 439,060   | 679,278   | 890,418   | 2,165,340 | 3,909,184 | 2,307,437 | 729,397   |
| Aspen                               |             |                                         |                     |         |         |         |         |         |           |           |           |           |           |           |           |
| Sawtimber                           | 1,730,681   | -                                       | 605                 | -       | 1,927   | 8,680   | 22,090  | 73,441  | 108,436   | 109,961   | 176,286   | 338,358   | 474,056   | 281,796   | 135,045   |
| Poetlimber                          | 1,095,429   | -                                       | -                   | 3,213   | 4,892   | 31,239  | 14,571  | 45,039  | 67,194    | 74,263    | 108,573   | 236,461   | 275,627   | 185,289   | 49,068    |
| Sapling-seedling                    | 338,960     | 3,286                                   | 8,368               | 18,345  | 35,274  | 49,836  | 57,868  | 49,938  | 28,422    | 33,499    | 19,954    | 32,485    | 1,685     | -         | -         |
| Total                               | 3,165,070   | 3,286                                   | 8,973               | 21,558  | 42,093  | 89,755  | 94,529  | 168,418 | 204,052   | 217,723   | 304,813   | 607,304   | 751,368   | 467,085   | 184,113   |
| Paper birch                         |             |                                         |                     |         |         |         |         |         |           |           |           |           |           |           |           |
| Sawtimber                           | 173,606     | -                                       | -                   | -       | -       | 2,204   | -       | 8,555   | 3,727     | 6,417     | 14,480    | 36,503    | 63,868    | 29,918    | 7,934     |
| Poetlimber                          | 297,659     | -                                       | -                   | -       | 672     | 787     | 6,819   | 3,363   | 6,868     | 6,227     | 22,383    | 59,433    | 113,701   | 59,530    | 17,876    |
| Sapling-seedling                    | 7,966       | 125                                     | 897                 | -       | 2,094   | -       | 994     | 507     | 658       | 1,003     | 1,688     | -         | -         | -         | -         |
| Total                               | 479,231     | 125                                     | 897                 | -       | 2,766   | 2,991   | 7,813   | 12,425  | 11,253    | 13,647    | 38,551    | 95,936    | 177,569   | 89,448    | 25,810    |
| Balsam poplar                       |             |                                         |                     |         |         |         |         |         |           |           |           |           |           |           |           |
| Sawtimber                           | 121,630     | -                                       | -                   | 730     | -       | 3,877   | 5,898   | 9,999   | -         | 5,064     | 8,810     | 24,696    | 44,128    | 14,277    | 4,151     |
| Poetlimber                          | 70,041      | -                                       | -                   | -       | 1,933   | 649     | 2,025   | 8,318   | -         | 8,533     | 3,294     | 25,829    | 8,417     | 6,847     | 4,196     |
| Sapling-seedling                    | 20,992      | 495                                     | 1,749               | 2,664   | 2,708   | 7,308   | 1,702   | 1,371   | 2,995     | -         | -         | -         | -         | -         | -         |
| Total                               | 212,663     | 495                                     | 1,749               | 3,394   | 4,641   | 11,834  | 9,625   | 19,688  | 2,995     | 13,597    | 12,104    | 50,525    | 52,545    | 21,124    | 8,347     |
| Nonstocked                          | 1,204       | 653                                     | 551                 | -       | -       | -       | -       | -       | -         | -         | -         | -         | -         | -         | -         |
| All types                           |             |                                         |                     |         |         |         |         |         |           |           |           |           |           |           |           |
| Sawtimber                           | 16,696,542  | 863                                     | 3,939               | 14,669  | 35,954  | 134,715 | 239,428 | 432,585 | 665,914   | 1,010,491 | 1,207,011 | 3,378,902 | 5,097,637 | 3,123,002 | 1,351,432 |
| Poetlimber                          | 8,312,373   | -                                       | 3,558               | 12,297  | 32,666  | 89,764  | 148,675 | 268,447 | 392,092   | 505,898   | 755,630   | 1,548,845 | 2,221,660 | 1,468,090 | 864,751   |
| Sapling-seedling                    | 1,634,766   | 11,627                                  | 47,727 <sup>1</sup> | 73,261  | 141,285 | 210,248 | 222,995 | 258,490 | 207,269   | 152,877   | 135,088   | 115,468   | 43,064    | 14,170    | 1,197     |
| Nonstocked                          | 1,204       | 653                                     | 551                 | -       | -       | -       | -       | -       | -         | -         | -         | -         | -         | -         | -         |
| Total                               | 26,644,885  | 13,143                                  | 55,775              | 100,227 | 209,905 | 434,727 | 611,098 | 959,522 | 1,265,275 | 1,669,266 | 2,097,729 | 5,043,215 | 7,362,361 | 4,605,262 | 2,217,380 |

Table 55. -- Net volume of sawtimber on timberland by forest type, basal-area class, and stand-size class, Michigan, 1993

(In thousand board feet)

| Forest type and<br>stand-size class | Basal-area class (square feet per acre) |       |       |        |        |        |         |         |         |         |         |         |           |           | 181+      |
|-------------------------------------|-----------------------------------------|-------|-------|--------|--------|--------|---------|---------|---------|---------|---------|---------|-----------|-----------|-----------|
|                                     | All classes                             | 0-10  | 11-20 | 21-30  | 31-40  | 41-50  | 51-60   | 61-70   | 71-80   | 81-90   | 91-100  | 101-120 | 121-150   | 151-180   |           |
| Jack pine                           |                                         |       |       |        |        |        |         |         |         |         |         |         |           |           |           |
| Sawtimber                           | 1,156,899                               | -     | -     | 3,081  | 21,566 | 54,696 | 121,201 | 125,701 | 112,887 | 132,780 | 171,294 | 168,304 | 176,655   | 40,009    | 28,725    |
| Poletimber                          | 552,132                                 | -     | 1,183 | 1,501  | 4,884  | 13,628 | 30,766  | 59,973  | 66,713  | 48,786  | 59,887  | 96,905  | 133,443   | 19,033    | 15,430    |
| Sapling-seedling                    | 55,663                                  | 2,203 | 6,095 | 5,969  | 12,875 | 3,324  | 6,309   | 4,107   | 6,320   | 6,747   | 1,174   | 540     | -         | -         | -         |
| Total                               | 1,764,694                               | 2,203 | 7,278 | 10,551 | 39,325 | 71,648 | 188,276 | 189,781 | 185,920 | 188,313 | 232,355 | 265,749 | 310,098   | 59,042    | 44,155    |
| Red pine                            |                                         |       |       |        |        |        |         |         |         |         |         |         |           |           |           |
| Sawtimber                           | 3,625,699                               | -     | 5,190 | -      | 8,365  | 10,010 | 115,069 | 46,990  | 104,133 | 198,466 | 134,054 | 877,440 | 931,584   | 742,130   | 452,268   |
| Poletimber                          | 688,698                                 | -     | -     | 211    | -      | 1,455  | 3,026   | 17,036  | 45,218  | 31,650  | 50,529  | 94,517  | 97,034    | 182,347   | 165,675   |
| Sapling-seedling                    | 82,571                                  | 653   | 3,122 | 4,759  | 14,072 | 1,896  | 13,693  | -       | 7,572   | 696     | 15,633  | 6,349   | -         | 14,126    | -         |
| Total                               | 4,396,968                               | 653   | 8,312 | 4,970  | 22,437 | 13,361 | 131,788 | 64,026  | 156,923 | 230,812 | 200,216 | 978,306 | 1,028,618 | 938,603   | 617,943   |
| White pine                          |                                         |       |       |        |        |        |         |         |         |         |         |         |           |           |           |
| Sawtimber                           | 1,428,034                               | -     | -     | 473    | -      | 7,886  | 8,891   | 94,440  | 35,137  | 112,888 | 139,147 | 260,488 | 358,326   | 244,464   | 165,894   |
| Poletimber                          | 55,863                                  | -     | -     | -      | -      | 1,162  | 2,184   | 6,059   | 2,289   | 4,999   | 3,654   | 14,138  | 18,459    | 2,919     | -         |
| Sapling-seedling                    | 40,588                                  | -     | 1,844 | 1,088  | 8,606  | 7,300  | 2,807   | 1,402   | 12,757  | 4,784   | -       | -       | -         | -         | -         |
| Total                               | 1,524,485                               | -     | 1,844 | 1,561  | 8,606  | 16,348 | 13,882  | 101,901 | 50,183  | 122,671 | 142,801 | 274,626 | 376,785   | 247,383   | 165,894   |
| Balsam fir                          |                                         |       |       |        |        |        |         |         |         |         |         |         |           |           |           |
| Sawtimber                           | 971,787                                 | -     | -     | 5,553  | -      | 7,215  | 18,290  | 30,530  | 43,002  | 87,363  | 78,357  | 158,547 | 298,774   | 194,790   | 49,366    |
| Poletimber                          | 371,813                                 | -     | -     | -      | -      | 4,915  | 4,838   | 6,131   | 19,979  | 30,635  | 56,308  | 60,767  | 124,985   | 39,418    | 23,837    |
| Sapling-seedling                    | 217,462                                 | 7,904 | 4,186 | 5,704  | 9,932  | 19,576 | 16,861  | 40,353  | 56,884  | 19,206  | 14,908  | 14,503  | 7,445     | -         | -         |
| Total                               | 1,561,062                               | 7,904 | 4,186 | 11,257 | 9,932  | 31,706 | 39,989  | 77,014  | 119,865 | 137,204 | 149,573 | 233,817 | 431,204   | 234,208   | 73,203    |
| White spruce                        |                                         |       |       |        |        |        |         |         |         |         |         |         |           |           |           |
| Sawtimber                           | 291,683                                 | -     | -     | -      | -      | -      | 6,440   | 22,394  | 6,282   | 20,797  | 46,888  | 75,301  | 79,221    | 34,560    | -         |
| Poletimber                          | 126,532                                 | -     | -     | -      | 1,407  | -      | -       | -       | 28,739  | 4,597   | 3,947   | 11,515  | 51,215    | 25,112    | -         |
| Sapling-seedling                    | 22,357                                  | 659   | 876   | 1,942  | -      | -      | 946     | -       | 11,529  | -       | -       | 6,405   | -         | -         | -         |
| Total                               | 440,572                                 | 659   | 876   | 1,942  | 1,407  | -      | 7,386   | 22,394  | 46,550  | 25,394  | 50,835  | 93,221  | 130,436   | 59,672    | -         |
| Black spruce                        |                                         |       |       |        |        |        |         |         |         |         |         |         |           |           |           |
| Sawtimber                           | 211,627                                 | -     | -     | -      | 2,533  | 8,608  | 7,983   | 39,790  | 10,046  | 20,301  | 18,060  | 40,875  | 63,431    | -         | -         |
| Poletimber                          | 193,675                                 | -     | -     | 2,217  | -      | 1,185  | 8,233   | 18,472  | 14,715  | 27,651  | 36,218  | 61,639  | 14,108    | 1,574     | 7,663     |
| Sapling-seedling                    | 132,133                                 | -     | 2,961 | 3,390  | 9,215  | 17,091 | 40,779  | 24,624  | 14,320  | 11,212  | 6,497   | 2,044   | -         | -         | -         |
| Total                               | 537,435                                 | -     | 2,961 | 5,607  | 11,748 | 26,884 | 56,995  | 82,886  | 39,081  | 59,164  | 60,775  | 104,558 | 77,539    | 1,574     | 7,663     |
| Northern white-cedar                |                                         |       |       |        |        |        |         |         |         |         |         |         |           |           |           |
| Sawtimber                           | 3,425,244                               | -     | 1,508 | 2,019  | 14,172 | 11,142 | 19,976  | 29,603  | 57,211  | 80,774  | 94,710  | 442,637 | 947,285   | 814,009   | 910,198   |
| Poletimber                          | 1,202,922                               | -     | -     | -      | -      | 1,782  | 7,744   | 11,132  | 7,206   | 34,145  | 23,334  | 86,338  | 260,051   | 330,620   | 440,570   |
| Sapling-seedling                    | 118,409                                 | 767   | 938   | 1,526  | 3,611  | 8,451  | 7,019   | 9,973   | 15,328  | 10,797  | 2,456   | 25,672  | 25,370    | 6,130     | 371       |
| Total                               | 4,746,575                               | 767   | 2,446 | 3,545  | 17,783 | 21,375 | 34,739  | 50,708  | 79,745  | 125,716 | 120,500 | 554,647 | 1,232,706 | 1,150,759 | 1,351,139 |
| Tamarack                            |                                         |       |       |        |        |        |         |         |         |         |         |         |           |           |           |
| Sawtimber                           | 119,276                                 | -     | 4,962 | 735    | -      | 10,623 | 16,690  | 9,045   | 22,730  | 4,077   | -       | 23,597  | -         | -         | 26,817    |
| Poletimber                          | 40,562                                  | -     | -     | -      | -      | 8,115  | 2,093   | 2,161   | 3,296   | 9,086   | 1,741   | 6,136   | 7,934     | -         | -         |
| Sapling-seedling                    | 55,828                                  | -     | 4,527 | 8,533  | 3,433  | 4,693  | 3,217   | 4,784   | 2,400   | 5,620   | -       | 16,884  | 1,737     | -         | -         |
| Total                               | 215,666                                 | -     | 9,489 | 9,268  | 3,433  | 23,431 | 22,000  | 15,990  | 28,426  | 18,783  | 1,741   | 46,617  | 9,671     | -         | 26,817    |

(Table 55 continued on next page)

(Table 55 continued)

| Forest type and<br>stand-size class | Basal-area class (square feet per acre) |        |         |         |         |         |           |           |           |           |           |            |            |            |           |
|-------------------------------------|-----------------------------------------|--------|---------|---------|---------|---------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|-----------|
|                                     | All classes                             | 0-10   | 11-20   | 21-30   | 31-40   | 41-50   | 51-60     | 61-70     | 71-80     | 81-90     | 91-100    | 101-120    | 121-150    | 151-180    | 181+      |
| Oak-hickory                         |                                         |        |         |         |         |         |           |           |           |           |           |            |            |            |           |
| Sawtimber                           | 7,624,718                               | 4,398  | -       | 11,321  | 14,977  | 64,003  | 111,872   | 343,942   | 553,915   | 708,791   | 700,708   | 2,164,805  | 1,859,258  | 1,017,295  | 69,433    |
| Poetlimber                          | 1,001,797                               | -      | 145     | -       | 1,978   | 9,748   | 32,703    | 81,873    | 86,235    | 95,965    | 176,283   | 270,133    | 152,695    | 88,640     | 3,399     |
| Sapling-seedling                    | 244,220                                 | 592    | 12,651  | 21,652  | 20,323  | 30,888  | 68,255    | 28,593    | 10,721    | 2,274     | 46,314    | 1,957      | -          | -          | -         |
| Total                               | 8,870,735                               | 4,990  | 12,796  | 32,973  | 37,278  | 104,639 | 212,830   | 454,408   | 650,871   | 807,030   | 925,305   | 2,436,895  | 2,011,953  | 1,105,935  | 72,832    |
| Elm-ash-soft maple                  |                                         |        |         |         |         |         |           |           |           |           |           |            |            |            |           |
| Sawtimber                           | 4,500,756                               | -      | -       | 26,453  | 44,443  | 160,190 | 82,049    | 99,676    | 210,026   | 244,289   | 334,139   | 997,176    | 1,191,113  | 835,504    | 275,698   |
| Poetlimber                          | 841,791                                 | -      | -       | 6,520   | 3,973   | 10,462  | 43,707    | 48,740    | 48,505    | 53,921    | 55,669    | 220,822    | 221,116    | 92,196     | 36,160    |
| Sapling-seedling                    | 264,869                                 | 3,260  | 14,185  | 11,672  | 43,333  | 31,089  | 26,838    | 45,036    | 15,096    | 36,025    | 27,399    | 2,429      | 8,507      | -          | -         |
| Total                               | 5,607,416                               | 3,260  | 14,185  | 44,645  | 91,749  | 201,741 | 152,594   | 193,452   | 273,627   | 334,235   | 417,207   | 1,220,427  | 1,420,736  | 927,700    | 311,858   |
| Maple-birch                         |                                         |        |         |         |         |         |           |           |           |           |           |            |            |            |           |
| Sawtimber                           | 25,895,727                              | -      | 1,406   | 4,494   | 19,752  | 98,931  | 229,840   | 378,730   | 759,533   | 1,458,216 | 1,708,695 | 4,979,791  | 9,201,288  | 5,262,784  | 1,792,267 |
| Poetlimber                          | 5,258,747                               | -      | -       | 2,267   | 20,930  | 19,975  | 76,879    | 82,486    | 172,885   | 290,799   | 495,070   | 1,018,305  | 1,764,047  | 1,045,152  | 269,952   |
| Sapling-seedling                    | 1,153,509                               | 2,671  | 26,141  | 47,928  | 82,315  | 159,477 | 157,164   | 199,854   | 179,348   | 134,078   | 121,892   | 40,984     | 1,657      | -          | -         |
| Total                               | 32,307,983                              | 2,671  | 27,547  | 54,689  | 122,997 | 278,383 | 463,883   | 661,070   | 1,111,766 | 1,883,093 | 2,325,657 | 6,039,080  | 10,966,992 | 6,307,936  | 2,062,219 |
| Aspen                               |                                         |        |         |         |         |         |           |           |           |           |           |            |            |            |           |
| Sawtimber                           | 5,384,947                               | -      | 2,213   | -       | 7,088   | 31,943  | 70,375    | 234,411   | 356,054   | 342,262   | 562,301   | 1,060,841  | 1,443,447  | 864,952    | 409,060   |
| Poetlimber                          | 1,542,608                               | -      | -       | 392     | 2,778   | 15,688  | 16,633    | 59,182    | 89,997    | 99,470    | 163,956   | 355,322    | 394,524    | 281,566    | 63,100    |
| Sapling-seedling                    | 578,948                                 | 10,188 | 17,157  | 32,770  | 59,183  | 105,721 | 108,434   | 68,310    | 50,655    | 54,257    | 22,047    | 49,312     | 914        | -          | -         |
| Total                               | 7,506,503                               | 10,188 | 19,370  | 33,162  | 69,049  | 153,352 | 195,442   | 361,903   | 496,706   | 495,989   | 748,304   | 1,465,475  | 1,838,885  | 1,146,518  | 472,160   |
| Paper birch                         |                                         |        |         |         |         |         |           |           |           |           |           |            |            |            |           |
| Sawtimber                           | 508,274                                 | -      | -       | -       | -       | 7,231   | -         | 22,565    | 9,852     | 17,672    | 52,790    | 106,248    | 188,476    | 84,554     | 18,886    |
| Poetlimber                          | 415,359                                 | -      | -       | -       | 844     | 1,745   | 5,522     | 4,250     | 6,039     | 10,899    | 40,588    | 74,519     | 166,966    | 79,898     | 24,089    |
| Sapling-seedling                    | 13,456                                  | 266    | 2,588   | -       | 5,084   | -       | 1,016     | -         | 1,034     | 2,554     | 914       | -          | -          | -          | -         |
| Total                               | 937,089                                 | 266    | 2,588   | -       | 5,928   | 8,976   | 6,538     | 26,815    | 16,925    | 31,125    | 94,292    | 180,767    | 355,442    | 164,452    | 42,975    |
| Balsam poplar                       |                                         |        |         |         |         |         |           |           |           |           |           |            |            |            |           |
| Sawtimber                           | 406,379                                 | -      | -       | 2,878   | -       | 14,850  | 22,194    | 35,098    | -         | 17,558    | 28,783    | 83,651     | 143,855    | 49,778     | 7,734     |
| Poetlimber                          | 111,027                                 | -      | -       | -       | 2,405   | 461     | 2,432     | 16,536    | -         | 13,891    | 7,930     | 41,718     | 13,490     | 6,382      | 5,782     |
| Sapling-seedling                    | 32,368                                  | -      | 2,761   | 9,958   | 3,560   | 7,781   | 1,700     | 1,150     | 5,458     | -         | -         | -          | -          | -          | -         |
| All stands                          | 549,774                                 | -      | 2,761   | 12,836  | 5,965   | 23,092  | 26,326    | 52,784    | 5,458     | 31,449    | 36,713    | 125,369    | 157,345    | 56,160     | 13,516    |
| Nonstocked                          | 4,257                                   | 2,095  | 2,162   | -       | -       | -       | -         | -         | -         | -         | -         | -          | -          | -          | -         |
| All types                           |                                         |        |         |         |         |         |           |           |           |           |           |            |            |            |           |
| Sawtimber                           | 55,551,050                              | 4,398  | 15,279  | 57,007  | 132,896 | 487,328 | 830,870   | 1,512,915 | 2,280,808 | 3,446,234 | 4,069,726 | 11,439,701 | 16,882,713 | 10,184,829 | 4,206,346 |
| Poetlimber                          | 12,403,526                              | -      | 1,328   | 13,108  | 39,199  | 90,321  | 236,760   | 414,031   | 591,816   | 756,494   | 1,177,114 | 2,412,774  | 3,420,067  | 2,194,857  | 1,055,657 |
| Sapling-seedling                    | 3,012,381                               | 29,163 | 100,032 | 156,891 | 275,542 | 397,287 | 455,038   | 428,186   | 389,422   | 288,250   | 259,234   | 167,079    | 45,630     | 20,256     | 371       |
| Nonstocked                          | 4,257                                   | 2,095  | 2,162   | -       | -       | -       | -         | -         | -         | -         | -         | -          | -          | -          | -         |
| Total                               | 70,971,214                              | 35,656 | 118,801 | 227,006 | 447,637 | 974,936 | 1,522,688 | 2,355,132 | 3,262,046 | 4,490,978 | 5,506,074 | 14,019,554 | 20,348,410 | 12,399,942 | 5,262,374 |

<sup>1</sup> International 1/4-inch rule.

Table 56. Net volume of sawtimber on timberland by species group, grade, and Forest Survey Unit, Michigan, 1993  
(In thousand board feet)

| Eastern Upper Peninsula Unit |            |         |           |           |              | Western Upper Peninsula Unit |            |           |           |            |              |
|------------------------------|------------|---------|-----------|-----------|--------------|------------------------------|------------|-----------|-----------|------------|--------------|
| Species                      | Total      | 1       | 2         | 3         | 4            | Species                      | Total      | 1         | 2         | 3          | 4            |
| Softwoods                    |            |         |           |           |              | Softwoods                    |            |           |           |            |              |
| Jack pine                    | 445,135    | -       | -         | 1,640     | 443,495      | -                            | 342,139    | -         | -         | 6,789      | 335,350      |
| Red pine                     | 1,110,683  | 13,476  | 35,835    | 1,061,372 | -            | -                            | 566,657    | 122,273   | 32,941    | 411,443    | -            |
| White pine                   | 1,070,749  | 201,314 | 260,120   | 405,560   | 203,755      | -                            | 1,068,936  | 161,695   | 297,139   | 528,244    | 81,858       |
| White spruce                 | 615,977    | 1,168   | 13,683    | 601,126   | -            | -                            | 1,122,092  | -         | 25,210    | 1,096,882  | -            |
| Black spruce                 | 190,646    | -       | 1,995     | 188,651   | -            | -                            | 253,541    | -         | -         | 253,541    | -            |
| Balsam fir                   | 457,685    | -       | -         | 457,685   | -            | -                            | 772,432    | -         | -         | 772,432    | -            |
| Hemlock                      | 795,256    | 48,238  | 113,228   | 633,790   | -            | -                            | 1,908,724  | 28,113    | 170,864   | 1,709,947  | -            |
| Tamarack                     | 115,412    | -       | 13,906    | 101,506   | -            | -                            | 158,854    | -         | 12,715    | 146,139    | -            |
| Eastern redcedar             | -          | -       | -         | -         | -            | -                            | -          | -         | -         | -          | -            |
| Northern white-cedar         | 1,823,049  | 7,606   | 28,007    | 1,787,436 | -            | -                            | 1,605,852  | -         | 32,149    | 1,573,703  | -            |
| Other softwoods              | 15,212     | -       | -         | -         | 15,212       | -                            | 3,679      | -         | -         | 3,679      | -            |
| Total                        | 6,639,804  | 271,802 | 468,414   | 5,695,833 | 203,755      | -                            | 7,802,906  | 312,081   | 577,607   | 6,831,360  | 81,858       |
| Hardwoods                    |            |         |           |           |              | Hardwoods                    |            |           |           |            |              |
| Species                      | Total      | 1       | 2         | 3         | Tie & timber | Species                      | Total      | 1         | 2         | 3          | Tie & timber |
| Select white oak             | 2,354      | -       | -         | -         | 2,354        | -                            | 2,739      | -         | -         | -          | 2,739        |
| Select red oak               | 103,325    | 12,477  | 37,780    | 22,690    | 30,378       | -                            | 371,090    | 78,664    | 113,354   | 150,210    | 28,862       |
| Other red oak                | -          | -       | -         | -         | -            | -                            | -          | -         | -         | -          | -            |
| Select hickory               | -          | -       | -         | -         | -            | -                            | -          | -         | -         | -          | -            |
| Other hickory                | 1,138      | -       | -         | -         | 1,138        | -                            | -          | -         | -         | -          | -            |
| Basswood                     | 178,562    | 45,313  | 67,996    | 61,873    | 3,380        | -                            | 780,922    | 141,463   | 223,562   | 394,264    | 21,633       |
| Beech                        | 736,242    | 60,609  | 243,020   | 263,505   | 169,108      | -                            | 1,124      | 204       | 322       | 567        | 31           |
| Yellow birch                 | 341,800    | 42,561  | 125,591   | 143,256   | 30,392       | -                            | 983,766    | 167,822   | 248,273   | 529,378    | 38,293       |
| Hard maple                   | 1,705,093  | 173,008 | 586,972   | 763,981   | 181,132      | -                            | 4,685,546  | 639,399   | 1,437,841 | 2,264,556  | 343,750      |
| Soft maple                   | 1,263,087  | 85,239  | 350,576   | 622,620   | 204,652      | -                            | 1,560,360  | 79,902    | 357,882   | 985,290    | 137,286      |
| Elm                          | 20,731     | -       | 6,792     | 13,939    | -            | -                            | 115,494    | 115,494   | -         | -          | -            |
| Black ash                    | 60,825     | 2,294   | 21,022    | 32,374    | 5,135        | -                            | 201,125    | 17,344    | 68,702    | 111,163    | 3,916        |
| White & green ash            | 96,002     | 43,021  | 18,290    | 31,607    | 3,084        | -                            | 123,980    | 32,370    | 52,604    | 39,006     | -            |
| Sycamore                     | -          | -       | -         | -         | -            | -                            | -          | -         | -         | -          | -            |
| Cottonwood                   | 2,442      | -       | -         | -         | 2,442        | -                            | -          | -         | -         | -          | -            |
| Willow                       | 485        | -       | -         | -         | 485          | -                            | 1,856      | 485       | 787       | 584        | -            |
| Hackberry                    | -          | -       | -         | -         | -            | -                            | -          | -         | -         | -          | -            |
| Balsam poplar                | 371,222    | 29,486  | 115,006   | 156,469   | 70,261       | -                            | 183,199    | 49,337    | 58,125    | 67,815     | 7,922        |
| Bigtooth aspen               | 187,674    | 26,628  | 38,133    | 97,426    | 25,487       | -                            | 433,431    | 77,573    | 139,382   | 202,987    | 13,489       |
| Quaking aspen                | 906,866    | 80,605  | 272,405   | 417,696   | 136,160      | -                            | 1,819,235  | 59,463    | 317,086   | 1,263,772  | 178,914      |
| Paper birch                  | 354,886    | 8,884   | 91,907    | 209,839   | 44,256       | -                            | 450,175    | 16,694    | 129,579   | 280,138    | 23,764       |
| Tupelo                       | -          | -       | -         | -         | -            | -                            | -          | -         | -         | -          | -            |
| Black cherry                 | 123,830    | 2,477   | 54,369    | 60,826    | 6,158        | -                            | 106,161    | 3,242     | 42,169    | 51,793     | 8,957        |
| Black walnut                 | -          | -       | -         | -         | -            | -                            | -          | -         | -         | -          | -            |
| Butternut                    | 2,543      | -       | 677       | 1,866     | -            | -                            | -          | -         | -         | -          | -            |
| Yellow-poplar                | -          | -       | -         | -         | -            | -                            | -          | -         | -         | -          | -            |
| Sassafras                    | -          | -       | -         | -         | -            | -                            | -          | -         | -         | -          | -            |
| Other hardwoods              | 546        | -       | 145       | 401       | -            | -                            | -          | -         | -         | -          | -            |
| Total                        | 6,459,653  | 612,602 | 2,030,681 | 2,903,860 | 912,510      | -                            | 11,820,203 | 1,479,456 | 3,189,668 | 6,344,262  | 806,817      |
| All species                  | 13,099,457 | 884,404 | 2,499,095 | 8,599,693 | 1,116,265    | -                            | 19,623,109 | 1,791,537 | 3,767,275 | 13,175,622 | 888,675      |

Table 56 continued on the next page)

(Table 56 continued on the next page)

(Table 56 continued)

## Northern Lower Peninsula Unit

| Species              | Total     | Log grade |         |           |              |
|----------------------|-----------|-----------|---------|-----------|--------------|
|                      |           | 1         | 2       | 3         | 4            |
| Softwoods            |           |           |         |           |              |
| Jack pine            | 653,770   | 3,103     | -       | 650,667   | -            |
| Red pine             | 2,828,944 | 124,513   | 167,108 | 2,537,323 | -            |
| White pine           | 1,396,576 | 150,692   | 309,296 | 738,021   | 198,567      |
| White spruce         | 187,725   | 10,471    | 23,970  | 153,284   | -            |
| Black spruce         | 64,714    | -         | 2,675   | 62,039    | -            |
| Balsam fir           | 248,908   | -         | 10,514  | 238,394   | -            |
| Hemlock              | 409,481   | 10,217    | 35,806  | 363,458   | -            |
| Tamarack             | 120,545   | 2,980     | 5,091   | 112,474   | -            |
| Eastern redcedar     | 2,666     | -         | 106     | 2,560     | -            |
| Northern white-cedar | 1,250,687 | -         | 49,694  | 1,200,993 | -            |
| Other softwoods      | 110,789   | -         | -       | 110,789   | -            |
| Total                | 7,274,805 | 301,976   | 604,260 | 6,170,002 | 198,567      |
| Tree grade           |           |           |         |           |              |
| Species              | Total     | 1         | 2       | 3         | Tie & timber |

| Species | Total | Tree grade |   |   |              |
|---------|-------|------------|---|---|--------------|
|         |       | 1          | 2 | 3 | Tie & timber |

|                    |                   |                  |                  |                   |                  |
|--------------------|-------------------|------------------|------------------|-------------------|------------------|
| <b>Hardwoods</b>   |                   |                  |                  |                   |                  |
| Select white oak   | 907,489           | 75,402           | 257,849          | 431,975           | 142,263          |
| Select red oak     | 3,289,938         | 547,704          | 1,162,142        | 1,206,011         | 374,081          |
| Other red oak      | 579,186           | 30,560           | 88,610           | 274,393           | 185,623          |
| Select hickory     | 3,145             | 166              | 481              | 1,490             | 1,008            |
| Other hickory      | 3,229             | 170              | 494              | 1,530             | 1,035            |
| Basswood           | 1,148,903         | 188,250          | 509,486          | 442,583           | 8,584            |
| Beech              | 632,167           | 102,442          | 261,551          | 251,514           | 16,660           |
| Yellow birch       | 118,263           | 14,741           | 32,558           | 61,905            | 9,059            |
| Hard maple         | 2,192,548         | 232,304          | 654,060          | 1,116,202         | 189,982          |
| Soft maple         | 2,620,902         | 270,837          | 767,959          | 1,348,004         | 234,102          |
| Elm                | 47,149            | 16,481           | 25,981           | 4,687             | -                |
| Black ash          | 94,748            | 2,296            | 37,540           | 50,390            | 4,522            |
| White & green ash  | 830,289           | 213,794          | 304,583          | 297,266           | 14,646           |
| Sycamore           | 6,243             | 1,608            | 2,290            | 2,235             | 110              |
| Cottonwood         | 70,003            | 45,504           | 13,405           | 8,758             | 2,336            |
| Willow             | 30,990            | 3,759            | 14,108           | 7,566             | 5,557            |
| Hackberry          | -                 | -                | -                | -                 | -                |
| Balsam poplar      | 393,608           | 61,693           | 106,789          | 177,575           | 47,551           |
| Bigtooth aspen     | 2,396,019         | 116,555          | 731,559          | 1,351,424         | 196,481          |
| Quaking aspen      | 1,882,083         | 99,611           | 545,815          | 1,005,605         | 231,052          |
| Paper birch        | 379,474           | 5,774            | 78,805           | 263,593           | 31,302           |
| Tupelo             | 1,886             | 29               | 392              | 1,309             | 156              |
| Black cherry       | 303,039           | 56,609           | 75,586           | 153,242           | 17,602           |
| Black walnut       | 3,703             | -                | 3,703            | -                 | -                |
| Butternut          | 1,706             | -                | -                | 1,706             | -                |
| Yellow-poplar      | -                 | -                | -                | -                 | -                |
| Sassafras          | 10,423            | -                | 5,590            | 4,833             | -                |
| Other hardwoods    | -                 | -                | -                | -                 | -                |
| <b>Total</b>       | <b>17,947,133</b> | <b>2,086,289</b> | <b>5,681,336</b> | <b>8,465,796</b>  | <b>1,713,712</b> |
| <b>All species</b> | <b>25,221,938</b> | <b>2,388,265</b> | <b>6,285,596</b> | <b>14,635,798</b> | <b>1,912,279</b> |

<sup>1</sup> International 1/4-inch rule.

## Southern Lower Peninsula Unit

| Species              | Total   | Log grade |        |         |              |
|----------------------|---------|-----------|--------|---------|--------------|
|                      |         | 1         | 2      | 3       | 4            |
| Softwoods            |         |           |        |         |              |
| Jack pine            | 33,556  | -         | -      | 33,556  | -            |
| Red pine             | 285,654 | -         | -      | 285,654 | -            |
| White pine           | 437,178 | 25,364    | 20,484 | 330,785 | 60,545       |
| White spruce         | 24,342  | -         | -      | 24,342  | -            |
| Black spruce         | -       | -         | -      | -       | -            |
| Balsam fir           | 2,003   | -         | 290    | 1,713   | -            |
| Hemlock              | 40,551  | -         | 5,876  | 34,675  | -            |
| Tamarack             | 35,871  | -         | 22,577 | 13,294  | -            |
| Eastern redcedar     | 2,211   | -         | -      | 2,211   | -            |
| Northern white-cedar | 17,308  | -         | -      | 17,308  | -            |
| Other softwoods      | 96,372  | -         | -      | 96,372  | -            |
| Total                | 975,046 | 25,364    | 49,227 | 839,910 | 60,545       |
| Tree grade           |         |           |        |         |              |
| Species              | Total   | 1         | 2      | 3       | Tie & timber |

| Species | Total | Tree grade |   |   |              |
|---------|-------|------------|---|---|--------------|
|         |       | 1          | 2 | 3 | Tie & timber |

|                    |                   |                  |                  |                  |                  |
|--------------------|-------------------|------------------|------------------|------------------|------------------|
| <b>Hardwoods</b>   |                   |                  |                  |                  |                  |
| Select white oak   | 1,747,301         | 325,170          | 569,874          | 655,556          | 196,701          |
| Select red oak     | 1,749,079         | 398,618          | 462,392          | 533,336          | 354,733          |
| Other red oak      | 740,840           | 129,416          | 225,124          | 229,675          | 156,625          |
| Select hickory     | 268,263           | 38,409           | 77,533           | 101,769          | 50,552           |
| Other hickory      | 173,800           | 31,764           | 48,636           | 56,219           | 37,181           |
| Basswood           | 396,138           | 136,601          | 144,253          | 115,284          | -                |
| Beech              | 307,418           | 88,249           | 100,463          | 101,362          | 17,344           |
| Yellow birch       | 29,342            | -                | 3,892            | 20,711           | 4,739            |
| Hard maple         | 699,733           | 303,208          | 177,106          | 171,030          | 48,389           |
| Soft maple         | 2,264,189         | 767,385          | 583,327          | 677,993          | 235,484          |
| Elm                | 248,094           | 11,799           | 49,029           | 163,200          | 24,066           |
| Black ash          | 118,519           | -                | 51,290           | 63,359           | 3,870            |
| White & green ash  | 1,164,386         | 307,010          | 417,129          | 356,020          | 84,227           |
| Sycamore           | 101,445           | 26,488           | 36,332           | 32,590           | 6,035            |
| Cottonwood         | 447,716           | 93,142           | 101,562          | 201,283          | 51,729           |
| Willow             | 124,439           | 5,020            | 45,854           | 48,051           | 25,514           |
| Hackberry          | 7,544             | 1,198            | 2,176            | 2,960            | 1,210            |
| Balsam poplar      | 29,464            | 6,734            | 3,970            | 15,105           | 3,655            |
| Bigtooth aspen     | 276,641           | -                | 45,743           | 127,472          | 103,426          |
| Quaking aspen      | 128,374           | 13,499           | 11,173           | 64,121           | 39,581           |
| Paper birch        | 24,655            | -                | -                | 24,655           | -                |
| Tupelo             | 9,385             | -                | -                | 9,385            | -                |
| Black cherry       | 554,057           | 76,641           | 167,670          | 283,032          | 26,714           |
| Black walnut       | 157,291           | 31,645           | 71,144           | 49,118           | 5,384            |
| Butternut          | 22,990            | -                | 19,167           | 3,823            | -                |
| Yellow-poplar      | 162,735           | 27,454           | 86,263           | 44,381           | 4,637            |
| Sassafras          | 59,319            | 8,289            | 11,602           | 39,428           | -                |
| Other hardwoods    | 38,507            | 4,502            | 7,426            | 24,643           | 1,936            |
| <b>Total</b>       | <b>12,051,664</b> | <b>2,832,241</b> | <b>3,520,130</b> | <b>4,215,561</b> | <b>1,483,732</b> |
| <b>All species</b> | <b>13,026,710</b> | <b>2,857,605</b> | <b>3,569,357</b> | <b>5,055,471</b> | <b>1,544,277</b> |

(Table 56 continued on the next page)

(Table 56 continued)

## All Units

| Species              | Total      | Log grade |            |            |              |
|----------------------|------------|-----------|------------|------------|--------------|
|                      |            | 1         | 2          | 3          | 4            |
| Softwoods            |            |           |            |            |              |
| Jack pine            | 1,474,600  | 3,103     | 8,429      | 1,463,068  | -            |
| Red pine             | 4,791,938  | 260,262   | 235,884    | 4,295,792  | -            |
| White pine           | 3,973,439  | 539,065   | 887,039    | 2,002,610  | 544,725      |
| White spruce         | 1,950,136  | 11,639    | 62,863     | 1,875,634  | -            |
| Black spruce         | 508,901    | -         | 4,670      | 504,231    | -            |
| Balsam fir           | 1,481,028  | -         | 10,804     | 1,470,224  | -            |
| Hemlock              | 3,154,012  | 86,568    | 325,574    | 2,741,870  | -            |
| Tamarack             | 430,682    | 2,980     | 54,289     | 373,413    | -            |
| Eastern redcedar     | 4,877      | -         | 106        | 4,771      | -            |
| Northern white-cedar | 4,696,896  | 7,606     | 109,850    | 4,579,440  | -            |
| Other softwoods      | 226,052    | -         | -          | 226,052    | -            |
| Total                | 22,692,561 | 911,223   | 1,699,508  | 19,537,105 | 544,725      |
| Tree grade           |            |           |            |            |              |
| Species              | Total      | 1         | 2          | 3          | Tie & timber |
| Hardwoods            |            |           |            |            |              |
| Select white oak     | 2,659,883  | 400,572   | 827,723    | 1,092,624  | 338,964      |
| Select red oak       | 5,513,432  | 1,037,463 | 1,775,668  | 1,912,247  | 788,054      |
| Other red oak        | 1,320,026  | 159,976   | 313,734    | 504,068    | 342,248      |
| Select hickory       | 271,408    | 38,575    | 78,014     | 103,259    | 51,560       |
| Other hickory        | 178,167    | 31,934    | 49,130     | 58,887     | 38,216       |
| Basswood             | 2,504,525  | 511,627   | 945,297    | 1,014,004  | 33,597       |
| Beech                | 1,676,951  | 251,504   | 605,356    | 616,948    | 203,143      |
| Yellow birch         | 1,473,171  | 225,124   | 410,314    | 755,250    | 82,483       |
| Hard maple           | 9,282,920  | 1,347,919 | 2,855,979  | 4,315,769  | 763,253      |
| Soft maple           | 7,708,538  | 1,203,363 | 2,059,744  | 3,633,907  | 811,524      |
| Elm                  | 431,468    | 143,774   | 81,802     | 181,826    | 24,066       |
| Black ash            | 475,217    | 21,934    | 178,554    | 257,286    | 17,443       |
| White & green ash    | 2,214,657  | 596,195   | 792,606    | 723,899    | 101,957      |
| Sycamore             | 107,688    | 28,096    | 38,622     | 34,825     | 6,145        |
| Cottonwood           | 520,161    | 138,646   | 114,967    | 210,041    | 56,507       |
| Willow               | 157,770    | 9,264     | 60,749     | 56,201     | 31,556       |
| Hackberry            | 7,544      | 1,198     | 2,176      | 2,960      | 1,210        |
| Balsam poplar        | 977,493    | 147,250   | 283,890    | 416,964    | 129,389      |
| Bigtooth aspen       | 3,293,765  | 220,756   | 954,817    | 1,779,309  | 338,883      |
| Quaking aspen        | 4,736,558  | 253,178   | 1,146,479  | 2,751,194  | 585,707      |
| Paper birch          | 1,209,190  | 31,352    | 300,291    | 778,225    | 99,322       |
| Tupelo               | 11,271     | 29        | 392        | 10,694     | 156          |
| Black cherry         | 1,087,087  | 138,969   | 339,794    | 548,893    | 59,431       |
| Black walnut         | 160,994    | 31,645    | 74,847     | 49,118     | 5,384        |
| Butternut            | 27,239     | -         | 19,844     | 7,395      | -            |
| Yellow-poplar        | 162,735    | 27,454    | 86,263     | 44,381     | 4,637        |
| Sassafras            | 69,742     | 8,289     | 17,192     | 44,261     | -            |
| Other hardwoods      | 39,053     | 3,502     | 7,571      | 25,044     | 1,936        |
| Total                | 48,278,653 | 7,010,588 | 14,421,815 | 21,929,479 | 4,916,771    |
| All species          | 70,971,214 | 7,921,811 | 16,121,323 | 41,466,584 | 5,461,496    |

Table 57. -- Net volume of short-log trees (cull volume) in cubic feet on timberland  
by species group and diameter class, Michigan, 1993

(In thousand cubic feet)

| Species group         | Total   | Diameter class (inches at breast height) |           |           |           |           |           |           |        |
|-----------------------|---------|------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|--------|
|                       |         | 9.0-10.9                                 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-28.9 | 29.0+  |
| Softwoods             |         |                                          |           |           |           |           |           |           |        |
| Jack pine             | 5,699   | 2,260                                    | 1,647     | 834       | 958       | -         | -         | -         | -      |
| Red pine              | 4,068   | 1,625                                    | 768       | 897       | 142       | 510       | -         | 126       | -      |
| White pine            | 16,002  | 2,103                                    | 2,629     | 2,517     | 2,605     | 1,030     | 1,615     | 2,918     | 585    |
| White spruce          | 2,027   | 415                                      | 622       | 393       | -         | 420       | -         | 177       | -      |
| Black spruce          | 271     | 271                                      | -         | -         | -         | -         | -         | -         | -      |
| Balsam fir            | 2,829   | 539                                      | 886       | 1,220     | -         | 184       | -         | -         | -      |
| Hemlock               | 19,337  | 2,777                                    | 4,751     | 3,358     | 3,439     | 1,356     | 2,026     | 1,510     | 120    |
| Tamarack              | 1,812   | 509                                      | 983       | 147       | 173       | -         | -         | -         | -      |
| Eastern redcedar      | 161     | 161                                      | -         | -         | -         | -         | -         | -         | -      |
| Northern white-cedar  | 45,798  | 10,119                                   | 14,653    | 8,445     | 5,316     | 3,882     | 1,675     | 1,708     | -      |
| Other softwoods       | 1,769   | 887                                      | 802       | 80        | -         | -         | -         | -         | -      |
| Total softwoods       | 99,773  | 21,666                                   | 27,741    | 17,891    | 12,633    | 7,382     | 5,316     | 6,439     | 705    |
| Hardwoods             |         |                                          |           |           |           |           |           |           |        |
| Select white oak      | 30,011  | -                                        | 2,109     | 4,417     | 3,492     | 3,896     | 3,155     | 9,271     | 3,671  |
| Select red oak        | 43,204  | -                                        | 5,921     | 8,111     | 7,211     | 2,446     | 4,440     | 9,658     | 5,417  |
| Other red oak         | 14,408  | -                                        | 2,347     | 2,948     | 1,353     | 1,504     | 1,836     | 1,508     | 2,912  |
| Select hickory        | 659     | -                                        | 196       | -         | 222       | -         | 241       | -         | -      |
| Other hickory         | 1,166   | -                                        | -         | -         | -         | 674       | -         | 492       | -      |
| Basswood              | 12,337  | -                                        | 4,283     | 3,392     | 1,712     | 780       | 203       | 1,695     | 272    |
| Beech                 | 24,980  | -                                        | 1,200     | 5,078     | 5,159     | 3,076     | 2,260     | 7,894     | 313    |
| Yellow birch          | 37,615  | -                                        | 5,754     | 9,528     | 6,044     | 5,265     | 3,470     | 6,013     | 1,541  |
| Hard maple            | 87,974  | -                                        | 16,317    | 18,980    | 16,881    | 11,790    | 7,799     | 11,463    | 4,744  |
| Soft maple            | 98,395  | -                                        | 12,478    | 20,778    | 17,568    | 14,404    | 7,689     | 15,421    | 10,057 |
| Elm                   | 6,326   | -                                        | 2,245     | 640       | 1,486     | 625       | -         | 1,330     | -      |
| Black ash             | 2,103   | -                                        | 1,154     | 678       | 271       | -         | -         | -         | -      |
| White & green ash     | 18,854  | -                                        | 4,427     | 4,563     | 2,739     | 1,915     | 765       | 1,914     | 2,531  |
| Cottonwood            | 994     | -                                        | -         | -         | 531       | -         | -         | 247       | 216    |
| Willow                | 4,420   | -                                        | 221       | 719       | 813       | 152       | 263       | 2,252     | -      |
| Balsam poplar         | 1,842   | -                                        | 829       | 493       | 246       | -         | 274       | -         | -      |
| Bigtooth aspen        | 13,071  | -                                        | 1,072     | 3,420     | 2,699     | 2,145     | 1,042     | 2,421     | 272    |
| Quaking aspen         | 34,440  | -                                        | 5,464     | 7,467     | 8,593     | 6,011     | 3,618     | 3,287     | -      |
| Paper birch           | 16,160  | -                                        | 5,363     | 4,618     | 2,420     | 1,526     | 470       | 1,642     | 121    |
| Black cherry          | 26,555  | -                                        | 4,091     | 8,837     | 4,259     | 4,506     | 1,926     | 2,936     | -      |
| Black walnut          | 1,512   | -                                        | -         | 162       | -         | 167       | -         | 725       | 458    |
| Butternut             | 561     | -                                        | -         | -         | -         | -         | -         | 561       | -      |
| Yellow-poplar         | 468     | -                                        | -         | -         | -         | -         | -         | -         | 468    |
| Sassafras             | 588     | -                                        | -         | 398       | -         | 190       | -         | -         | -      |
| Other hardwoods       | 2,853   | -                                        | 1,475     | 253       | 738       | 119       | 268       | -         | -      |
| Noncommercial species | 95      | -                                        | 95        | -         | -         | -         | -         | -         | -      |
| Total hardwoods       | 481,591 | -                                        | 77,041    | 105,480   | 84,437    | 61,191    | 39,719    | 80,730    | 32,993 |
| All species           | 581,364 | 21,666                                   | 104,782   | 123,371   | 97,070    | 68,573    | 45,035    | 87,169    | 33,698 |

Table 58. -- Net volume of short-log trees (cull volume) in board feet<sup>1</sup> on timberland  
by species group and diameter class, Michigan, 1993

(in thousand board feet)

| Species group         | Total     | Diameter class (inches at breast height) |           |           |           |           |           |           |        |   |   | 29.0+ |
|-----------------------|-----------|------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|--------|---|---|-------|
|                       |           | 9.0-10.9                                 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-28.9 |        |   |   |       |
| Softwoods             |           |                                          |           |           |           |           |           |           |        |   |   |       |
| Jack pine             | 18,942    | 7,249                                    | 5,416     | 2,879     | 3,398     | -         | -         | -         | -      | - | - | -     |
| Red pine              | 15,048    | 5,815                                    | 2,800     | 3,361     | 542       | 2,009     | -         | 521       | -      | - | - | -     |
| White pine            | 53,841    | 6,373                                    | 8,141     | 8,023     | 8,765     | 3,582     | 5,786     | 10,865    | 2,306  | - | - | -     |
| White spruce          | 10,014    | 1,923                                    | 3,005     | 1,949     | -         | 2,186     | -         | 951       | -      | - | - | -     |
| Black spruce          | 859       | 859                                      | -         | -         | -         | -         | -         | -         | -      | - | - | -     |
| Balsam fir            | 8,211     | 1,492                                    | 2,517     | 3,616     | -         | 586       | -         | -         | -      | - | - | -     |
| Hemlock               | 54,830    | 7,395                                    | 12,728    | 9,288     | 9,935     | 4,038     | 6,209     | 4,820     | 417    | - | - | -     |
| Tamarack              | 7,440     | 2,025                                    | 4,016     | 630       | 769       | -         | -         | -         | -      | - | - | -     |
| Eastern redcedar      | 727       | 727                                      | -         | -         | -         | -         | -         | -         | -      | - | - | -     |
| Northern white-cedar  | 160,795   | 34,116                                   | 50,117    | 29,784    | 19,255    | 14,423    | 6,381     | 6,719     | -      | - | - | -     |
| Other softwoods       | 7,674     | 3,778                                    | 3,533     | 363       | -         | -         | -         | -         | -      | - | - | -     |
| Total softwoods       | 338,381   | 71,752                                   | 92,273    | 59,893    | 42,664    | 26,824    | 18,376    | 23,876    | 2,723  | - | - | -     |
| Hardwoods             |           |                                          |           |           |           |           |           |           |        |   |   |       |
| Select white oak      | 74,910    | -                                        | 4,525     | 9,999     | 8,322     | 9,513     | 7,922     | 24,378    | 10,251 | - | - | -     |
| Select red oak        | 92,622    | -                                        | 10,921    | 16,124    | 14,968    | 5,272     | 9,760     | 22,263    | 13,314 | - | - | -     |
| Other red oak         | 32,440    | -                                        | 4,574     | 6,187     | 2,966     | 3,389     | 4,254     | 3,666     | 7,404  | - | - | -     |
| Select hickory        | 1,510     | -                                        | 402       | -         | 512       | -         | 596       | -         | -      | - | - | -     |
| Other hickory         | 2,945     | -                                        | -         | -         | -         | 1,607     | -         | 1,338     | -      | - | - | -     |
| Basswood              | 24,743    | -                                        | 7,858     | 6,768     | 3,546     | 1,659     | 442       | 3,818     | 652    | - | - | -     |
| Beech                 | 65,736    | -                                        | 2,824     | 12,493    | 13,154    | 8,122     | 6,106     | 22,106    | 931    | - | - | -     |
| Yellow birch          | 90,275    | -                                        | 12,429    | 21,864    | 14,426    | 12,965    | 8,746     | 15,646    | 4,199  | - | - | -     |
| Hard maple            | 197,082   | -                                        | 32,589    | 40,549    | 37,844    | 27,216    | 18,482    | 28,145    | 12,257 | - | - | -     |
| Soft maple            | 251,195   | -                                        | 27,533    | 49,799    | 44,013    | 37,187    | 20,405    | 42,610    | 29,648 | - | - | -     |
| Elm                   | 15,466    | -                                        | 4,969     | 1,543     | 3,695     | 1,610     | -         | 3,649     | -      | - | - | -     |
| Black ash             | 4,669     | -                                        | 2,492     | 1,532     | 645       | -         | -         | -         | -      | - | - | -     |
| White & green ash     | 40,446    | -                                        | 8,461     | 9,269     | 5,824     | 4,213     | 1,741     | 4,544     | 6,394  | - | - | -     |
| Cottonwood            | 3,307     | -                                        | -         | -         | 1,611     | -         | -         | 878       | 818    | - | - | -     |
| Willow                | 14,674    | -                                        | 610       | 2,087     | 2,491     | 495       | 878       | 8,113     | -      | - | - | -     |
| Balsam poplar         | 4,358     | -                                        | 1,842     | 1,190     | 606       | -         | 720       | -         | -      | - | - | -     |
| Bigtooth aspen        | 21,964    | -                                        | 1,618     | 5,491     | 4,473     | 3,689     | 1,826     | 4,360     | 507    | - | - | -     |
| Quaking aspen         | 73,285    | -                                        | 10,504    | 15,400    | 18,401    | 13,177    | 8,123     | 7,680     | -      | - | - | -     |
| Paper birch           | 38,065    | -                                        | 11,777    | 10,792    | 5,846     | 3,810     | 1,199     | 4,306     | 335    | - | - | -     |
| Black cherry          | 59,504    | -                                        | 8,266     | 19,225    | 9,634     | 10,479    | 4,604     | 7,296     | -      | - | - | -     |
| Black walnut          | 3,851     | -                                        | -         | 366       | -         | 404       | -         | 1,865     | 1,216  | - | - | -     |
| Butternut             | 1,444     | -                                        | -         | -         | -         | -         | -         | 1,444     | -      | - | - | -     |
| Yellow-poplar         | 1,236     | -                                        | -         | -         | -         | -         | -         | -         | -      | - | - | -     |
| Sassafras             | 1,730     | -                                        | -         | 1,147     | -         | 583       | -         | -         | -      | - | - | -     |
| Other hardwoods       | 8,025     | -                                        | 3,884     | 737       | 2,195     | 363       | 846       | -         | -      | - | - | -     |
| Noncommercial species | 242       | -                                        | 242       | -         | -         | -         | -         | -         | -      | - | - | -     |
| Total hardwoods       | 1,125,724 | -                                        | 158,320   | 232,562   | 195,172   | 145,753   | 96,650    | 208,105   | 89,162 | - | - | -     |
| All species           | 1,464,105 | 71,752                                   | 250,593   | 292,455   | 237,836   | 172,577   | 115,026   | 231,981   | 91,885 | - | - | -     |

<sup>1</sup>International 1/4-inch rule.

Table 59. -- Current annual growth of growing stock and sawtimber on timberland, 1979 and 1992, and average net annual growth of growing stock and sawtimber, 1980-1992 by softwoods and hardwoods and Forest Survey Unit, Michigan

| Forest Survey Unit<br>and softwoods<br>and hardwoods | Growing stock               |                                 |                             | Sawtimber                   |                                 |                             |
|------------------------------------------------------|-----------------------------|---------------------------------|-----------------------------|-----------------------------|---------------------------------|-----------------------------|
|                                                      | Current<br>annual<br>growth | Average<br>net annual<br>growth | Current<br>annual<br>growth | Current<br>annual<br>growth | Average<br>net annual<br>growth | Current<br>annual<br>growth |
|                                                      | 1979                        | 1980-1992                       | 1992                        | 1979                        | 1980-1992                       | 1992                        |
| <i>(In thousand cubic feet)</i>                      |                             |                                 |                             |                             |                                 |                             |
| <i>(In thousand board feet) <sup>1</sup></i>         |                             |                                 |                             |                             |                                 |                             |
| Eastern Upper Peninsula                              |                             |                                 |                             |                             |                                 |                             |
| Softwoods                                            | 45,092                      | 63,237                          | 67,262                      | 131,311                     | 242,504                         | 271,338                     |
| Hardwoods                                            | 61,935                      | 68,611                          | 75,607                      | 164,302                     | 223,532                         | 272,061                     |
| Total                                                | 107,027                     | 131,848                         | 142,869                     | 295,613                     | 466,036                         | 543,399                     |
| Western Upper Peninsula                              |                             |                                 |                             |                             |                                 |                             |
| Softwoods                                            | 41,931                      | 49,952                          | 57,226                      | 183,905                     | 231,828                         | 264,022                     |
| Hardwoods                                            | 111,777                     | 116,245                         | 125,361                     | 308,295                     | 390,096                         | 448,721                     |
| Total                                                | 153,708                     | 166,197                         | 182,587                     | 492,200                     | 621,924                         | 712,743                     |
| Northern Lower Peninsula                             |                             |                                 |                             |                             |                                 |                             |
| Softwoods                                            | 67,397                      | 102,443                         | 109,861                     | 151,350                     | 323,163                         | 420,362                     |
| Hardwoods                                            | 174,595                     | 211,903                         | 232,893                     | 494,067                     | 738,215                         | 852,390                     |
| Total                                                | 241,992                     | 314,346                         | 342,754                     | 645,417                     | 1,061,378                       | 1,272,752                   |
| Southern Lower Peninsula                             |                             |                                 |                             |                             |                                 |                             |
| Softwoods                                            | 11,362                      | 12,580                          | 14,667                      | 29,018                      | 50,302                          | 59,701                      |
| Hardwoods                                            | 90,766                      | 135,444                         | 142,133                     | 291,841                     | 465,548                         | 486,444                     |
| Total                                                | 102,128                     | 148,024                         | 156,800                     | 320,859                     | 515,850                         | 546,145                     |
| All Units                                            |                             |                                 |                             |                             |                                 |                             |
| Softwoods                                            | 165,782                     | 228,212                         | 249,016                     | 495,584                     | 847,797                         | 1,015,423                   |
| Hardwoods                                            | 439,073                     | 532,203                         | 575,994                     | 1,258,505                   | 1,817,391                       | 2,059,616                   |
| Total                                                | 604,855                     | 760,415                         | 825,010                     | 1,754,089                   | 2,665,188                       | 3,075,039                   |

<sup>1</sup> International 1/4-inch rule.

Table 60. -- Average net annual growth of growing stock on timberland by species group and ownership class,  
Michigan, 1980-1992

(In thousand cubic feet)

| Species group        | Total   | Ownership class |               |         |                    |        |                 |            |           |
|----------------------|---------|-----------------|---------------|---------|--------------------|--------|-----------------|------------|-----------|
|                      |         | National forest | Other federal | State   | County & municipal | Indian | Forest industry | Individual | Corporate |
| Softwoods            |         |                 |               |         |                    |        |                 |            |           |
| Jack pine            | 12,211  | 3,889           | 316           | 4,717   | 387                | -      | 169             | 1,910      | 823       |
| Red pine             | 78,310  | 25,196          | 182           | 21,847  | 2,080              | -      | 797             | 23,873     | 4,335     |
| White pine           | 32,518  | 5,041           | 86            | 7,576   | 477                | -      | 1,572           | 14,149     | 3,617     |
| White spruce         | 19,649  | 3,736           | 137           | 2,972   | 147                | 22     | 2,153           | 8,162      | 2,320     |
| Black spruce         | 3,410   | 323             | 2             | 1,035   | 77                 | 3      | 516             | 1,053      | 401       |
| Balsam fir           | 12,484  | 307             | 130           | 2,445   | 45                 | 10     | 1,172           | 6,532      | 1,843     |
| Hemlock              | 12,256  | 1,640           | 41            | 1,392   | 122                | 15     | 2,828           | 4,156      | 2,062     |
| Tamarack             | 4,481   | 548             | -             | 1,039   | 17                 | -9     | 554             | 1,706      | 626       |
| Eastern redcedar     | 230     | -               | -             | 27      | -                  | -      | -               | 184        | 19        |
| Northern white-cedar | 46,202  | 5,139           | 54            | 12,088  | 425                | 59     | 5,531           | 18,623     | 4,283     |
| Other softwoods      | 6,461   | 45              | -             | 162     | 122                | -      | -               | 5,738      | 394       |
| Total softwoods      | 228,212 | 45,864          | 948           | 55,300  | 3,899              | 100    | 15,292          | 86,086     | 20,723    |
| Hardwoods            |         |                 |               |         |                    |        |                 |            |           |
| Select white oak     | 18,733  | 2,198           | -             | 2,941   | 521                | -      | 102             | 11,099     | 1,872     |
| Other white oak      | 25      | -               | -             | -       | -                  | -      | -               | 25         | -         |
| Select red oak       | 44,236  | 4,323           | 43            | 9,053   | 547                | -      | 666             | 24,945     | 4,659     |
| Other red oak        | 10,180  | 1,791           | 31            | 1,301   | 78                 | -      | -               | 6,343      | 636       |
| Select hickory       | 1,965   | -               | -             | 112     | 97                 | -      | -               | 1,618      | 138       |
| Other hickory        | 1,691   | -               | -             | 241     | 9                  | -      | -               | 1,291      | 150       |
| Basswood             | 20,084  | 1,923           | -             | 3,665   | 301                | 42     | 1,570           | 10,183     | 2,400     |
| Beech                | 13,694  | 1,388           | 165           | 1,856   | 155                | -      | 1,058           | 6,859      | 2,213     |
| Yellow birch         | 4,448   | 232             | 133           | 612     | 83                 | 21     | 1,113           | 1,436      | 818       |
| Hard maple           | 113,964 | 13,362          | 168           | 15,922  | 1,608              | 136    | 18,967          | 48,880     | 14,921    |
| Soft maple           | 108,225 | 11,039          | 232           | 17,672  | 1,358              | 100    | 7,481           | 58,390     | 11,953    |
| Elm                  | 7,415   | -1,686          | -6            | 84      | 35                 | -63    | -1,006          | 10,260     | -203      |
| Black ash            | 8,383   | 760             | -             | 1,477   | 185                | 47     | 326             | 4,772      | 816       |
| White & green ash    | 33,068  | 837             | 7             | 2,753   | 606                | -      | 689             | 24,509     | 3,667     |
| Sycamore             | 456     | -               | -             | -       | -                  | -      | -               | 449        | 7         |
| Cottonwood           | 5,224   | -84             | -             | 301     | 169                | -      | -               | 4,182      | 656       |
| Willow               | 773     | 9               | -             | 113     | -27                | -      | -               | 549        | 129       |
| Hackberry            | 173     | -               | -             | -       | -                  | -      | -               | 173        | -         |
| Balsam poplar        | 6,181   | 602             | -             | 1,148   | -16                | 22     | 477             | 3,806      | 142       |
| Bigtooth aspen       | 40,817  | 3,444           | 69            | 10,578  | 532                | 8      | 329             | 21,631     | 4,226     |
| Quaking aspen        | 57,148  | 5,008           | 270           | 11,218  | 566                | 55     | 4,006           | 29,691     | 6,334     |
| Paper birch          | 13,196  | 730             | 77            | 3,214   | 173                | 8      | 718             | 6,438      | 1,838     |
| Tupelo               | 293     | -               | -             | 30      | -                  | -      | -               | 263        | -         |
| Black cherry         | 14,445  | 915             | 19            | 1,698   | 193                | -      | 329             | 9,688      | 1,603     |
| Black walnut         | 1,758   | -               | -             | 137     | 63                 | -      | -               | 1,488      | 70        |
| Butternut            | 195     | -               | -             | -       | -                  | -      | -               | 162        | 33        |
| Yellow-poplar        | 1,332   | -               | -             | 64      | 9                  | -      | -               | 1,274      | -15       |
| Sassafras            | 2,191   | 6               | -             | 452     | 43                 | -      | -               | 1,632      | 58        |
| Other hardwoods      | 1,910   | -               | 2             | 21      | 72                 | -      | 5               | 1,543      | 267       |
| Total hardwoods      | 532,203 | 46,797          | 1,210         | 86,663  | 7,360              | 376    | 36,830          | 293,579    | 59,388    |
| All species          | 760,415 | 92,661          | 2,158         | 141,963 | 11,259             | 476    | 52,122          | 379,665    | 80,111    |

Table 61. -- Average net annual growth of sawtimber on timberland by species group and ownership class,  
Michigan, 1980-1992

(In thousand board feet)<sup>1</sup>

| Species group        | Total     | Ownership class |               |         |                    |        |                 |            |           |
|----------------------|-----------|-----------------|---------------|---------|--------------------|--------|-----------------|------------|-----------|
|                      |           | National forest | Other federal | State   | County & municipal | Indian | Forest industry | Individual | Corporate |
| Softwoods            |           |                 |               |         |                    |        |                 |            |           |
| Jack pine            | 55,552    | 14,938          | 1,089         | 24,118  | 1,629              | -      | 886             | 9,446      | 3,446     |
| Red pine             | 242,699   | 90,044          | 736           | 72,011  | 5,030              | -      | 1,442           | 62,315     | 11,121    |
| White pine           | 157,432   | 22,744          | 219           | 36,479  | 2,374              | -      | 8,761           | 67,471     | 19,384    |
| White spruce         | 80,833    | 15,819          | 681           | 12,630  | 1,063              | 112    | 10,187          | 27,849     | 12,492    |
| Black spruce         | 5,797     | -557            | 6             | 3,195   | 151                | -      | 834             | 1,042      | 1,126     |
| Balsam fir           | 46,338    | 3,475           | 512           | 9,145   | 208                | 9      | 3,954           | 20,833     | 8,202     |
| Hemlock              | 70,789    | 11,114          | 252           | 7,973   | 743                | 101    | 16,577          | 22,258     | 11,771    |
| Tamarack             | 16,116    | 2,128           | -             | 3,576   | 233                | -      | 1,985           | 5,774      | 2,420     |
| Eastern redcedar     | 409       | -               | -             | -       | -                  | -      | -               | 409        | -         |
| Northern white-cedar | 154,262   | 20,684          | 166           | 39,648  | 1,450              | 84     | 20,709          | 55,255     | 16,266    |
| Other softwoods      | 17,570    | 228             | -             | 314     | 484                | -      | -               | 15,561     | 983       |
| Total softwoods      | 847,797   | 180,617         | 3,661         | 209,089 | 13,365             | 306    | 65,335          | 288,213    | 87,211    |
| Hardwoods            |           |                 |               |         |                    |        |                 |            |           |
| Select white oak     | 82,414    | 8,337           | -             | 10,685  | 2,265              | -      | 458             | 52,708     | 7,961     |
| Select red oak       | 209,222   | 19,806          | 179           | 42,581  | 3,224              | -      | 2,918           | 117,819    | 22,695    |
| Other red oak        | 44,620    | 8,736           | -             | 4,947   | 469                | -      | -               | 27,132     | 3,336     |
| Select hickory       | 7,286     | -               | -             | 503     | 545                | -      | -               | 5,456      | 782       |
| Other hickory        | 6,708     | -               | -             | 916     | 58                 | -      | -               | 5,171      | 563       |
| Basswood             | 88,004    | 9,950           | -             | 17,443  | 684                | 197    | 5,712           | 45,034     | 8,984     |
| Beech                | 54,064    | 6,221           | 738           | 5,460   | 533                | -      | 4,838           | 27,322     | 8,952     |
| Yellow birch         | 18,897    | 3,614           | 587           | 1,585   | -42                | 185    | 3,870           | 6,369      | 2,729     |
| Hard maple           | 325,416   | 38,309          | 515           | 37,188  | 4,520              | 513    | 56,456          | 142,483    | 45,432    |
| Soft maple           | 313,574   | 32,037          | 264           | 43,315  | 4,135              | 286    | 21,703          | 178,764    | 33,070    |
| Elm                  | 11,101    | -3,926          | -27           | -308    | 119                | -206   | -1,744          | 18,119     | -926      |
| Black ash            | 13,625    | 1,752           | -             | 1,481   | 332                | 1      | 909             | 7,353      | 1,797     |
| White & green ash    | 110,735   | 2,470           | 38            | 7,898   | 1,929              | -      | 1,777           | 83,720     | 12,903    |
| Sycamore             | 2,735     | -               | -             | -       | -                  | -      | -               | 2,696      | 39        |
| Cottonwood           | 24,403    | -466            | -             | 929     | 938                | -      | -               | 20,218     | 2,784     |
| Willow               | 3,906     | -               | -             | 707     | 100                | -      | -               | 2,795      | 304       |
| Hackberry            | 301       | -               | -             | -       | -                  | -      | -               | 301        | -         |
| Balsam poplar        | 21,811    | 1,109           | -             | 5,010   | 94                 | 5      | 1,378           | 13,487     | 728       |
| Bigtooth aspen       | 162,687   | 10,289          | 343           | 37,901  | 2,806              | 68     | 1,241           | 91,056     | 18,983    |
| Quaking aspen        | 207,715   | 25,298          | 1,542         | 35,940  | 2,376              | 250    | 14,192          | 100,388    | 27,729    |
| Paper birch          | 41,988    | 1,824           | 201           | 10,740  | 227                | -      | 3,839           | 18,867     | 6,290     |
| Tupelo               | 713       | -               | -             | 64      | -                  | -      | -               | 649        | -         |
| Black cherry         | 44,469    | 4,373           | 94            | 4,757   | 776                | -      | 1,478           | 28,507     | 4,484     |
| Black walnut         | 6,549     | -               | -             | 261     | -                  | -      | -               | 6,024      | 264       |
| Butternut            | 954       | 1               | -             | -       | -                  | -      | -               | 870        | 83        |
| Yellow-poplar        | 6,036     | -               | -             | 333     | 48                 | -      | -               | 5,715      | -60       |
| Sassafras            | 4,451     | -               | -             | 382     | -                  | -      | -               | 3,908      | 161       |
| Other hardwoods      | 3,007     | -               | 11            | -       | 429                | -      | -               | 2,594      | -27       |
| Total hardwoods      | 1,817,391 | 169,734         | 4,485         | 270,718 | 26,565             | 1,299  | 119,025         | 1,015,525  | 210,040   |
| All species          | 2,665,188 | 350,351         | 8,146         | 479,807 | 39,930             | 1,605  | 184,360         | 1,303,738  | 297,251   |

<sup>1</sup>International 1/4-inch rule.

Table 62. -- Average net annual growth of growing stock on timberland by species group and forest type, Michigan, 1980-1992

(In thousand cubic feet)

| Species group        | All types | Forest type |          |            |            |              |              |                      |          |             |                    |                   | Paper birch | Balsam poplar | Non-stocked |       |
|----------------------|-----------|-------------|----------|------------|------------|--------------|--------------|----------------------|----------|-------------|--------------------|-------------------|-------------|---------------|-------------|-------|
|                      |           | Jack pine   | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-beech-birch |             |               |             | Aspen |
| Softwoods            |           |             |          |            |            |              |              |                      |          |             |                    |                   |             |               |             |       |
| Jack pine            | 12,211    | 10,078      | 423      | -14        | 81         | 70           | 441          | 3                    | -10      | 607         | -81                | 151               | 398         | 2             | -           | 62    |
| Red pine             | 78,310    | 3,548       | 63,677   | 836        | 365        | 193          | 313          | 87                   | 1        | 2,440       | 242                | 2,990             | 3,254       | 325           | 9           | 30    |
| White pine           | 32,518    | 1,109       | 3,073    | 8,632      | 1,275      | 342          | 775          | 1,592                | 84       | 2,737       | 640                | 8,951             | 2,777       | 497           | 34          | -     |
| White spruce         | 19,649    | 192         | 582      | 165        | 2,966      | 4,907        | 834          | -15                  | 62       | 287         | 676                | 4,192             | 4,120       | 413           | 257         | 11    |
| Black spruce         | 3,410     | 96          | 9        | -105       | 584        | 107          | 3,465        | -1,520               | 62       | -21         | 66                 | 236               | 413         | -             | 18          | -     |
| Balsam fir           | 12,484    | 78          | 168      | 81         | 4,715      | 96           | 521          | -2,009               | 63       | 140         | 624                | 2,403             | 4,093       | 991           | 519         | 1     |
| Hemlock              | 12,256    | -           | 94       | 72         | 166        | 7            | 43           | 356                  | 1        | 99          | 684                | 10,287            | 312         | 118           | 17          | -     |
| Tamarack             | 4,481     | 17          | 43       | 3          | 305        | 40           | 1,020        | 761                  | 1,686    | 7           | 82                 | 128               | 229         | 55            | 104         | 1     |
| Eastern redcedar     | 230       | -           | -        | -          | -          | -            | -            | -                    | -        | 118         | -                  | 112               | -           | -             | -           | -     |
| Northern white-cedar | 46,202    | 12          | 75       | 54         | 1,595      | 195          | 712          | 31,695               | 461      | 48          | 3,028              | 4,319             | 2,374       | 995           | 606         | 33    |
| Other softwoods      | 6,461     | 4,523       | 409      | 123        | 52         | 112          | 6            | 41                   | -        | 168         | 50                 | 887               | 75          | 15            | -           | -     |
| Total softwoods      | 228,212   | 19,653      | 68,553   | 9,847      | 12,104     | 6,069        | 8,130        | 30,991               | 2,410    | 6,630       | 6,011              | 34,656            | 18,045      | 3,411         | 1,564       | 138   |
| Hardwoods            |           |             |          |            |            |              |              |                      |          |             |                    |                   |             |               |             |       |
| Select white oak     | 18,733    | 80          | 327      | 101        | -          | -            | -            | 6                    | 1        | 13,283      | 1,252              | 3,101             | 547         | 35            | -           | -     |
| Other white oak      | 25        | -           | -        | -          | -          | -            | -            | -                    | -        | -           | 25                 | -                 | -           | -             | -           | -     |
| Select red oak       | 44,236    | 522         | 718      | 278        | 54         | 35           | -            | 41                   | 5        | 27,683      | 713                | 9,666             | 4,372       | 133           | 16          | -     |
| Other red oak        | 10,180    | 276         | 305      | 176        | -          | -            | -            | -                    | -        | 7,242       | 371                | 1,448             | 353         | -             | 9           | -     |
| Select hickory       | 1,965     | 23          | -        | -          | -          | -            | -            | -                    | -        | 1,080       | 51                 | 809               | 2           | -             | -           | -     |
| Other hickory        | 1,691     | 92          | 17       | -          | -          | -            | -            | -                    | -        | 692         | 37                 | 853               | -           | -             | -           | -     |
| Basswood             | 20,084    | 85          | 26       | 9          | 28         | -            | -            | 16                   | -        | 607         | 832                | 17,785            | 705         | -3            | -6          | -     |
| Beech                | 13,694    | -           | -3       | -10        | 20         | -            | -            | -                    | -        | 274         | 82                 | 13,082            | 249         | -             | -           | -     |
| Yellow birch         | 4,448     | -           | 11       | 35         | -5         | 17           | 4            | -151                 | -        | 24          | 2                  | 4,159             | 309         | 46            | -3          | -     |
| Hard maple           | 113,964   | 124         | 398      | 162        | 338        | 66           | 23           | 270                  | -        | 760         | 704                | 107,153           | 3,398       | 524           | 44          | -     |
| Soft maple           | 108,225   | 317         | 1,117    | 479        | 1,217      | 246          | 222          | 1,479                | 100      | 8,088       | 23,977             | 58,559            | 10,925      | 1,400         | 99          | -     |
| Elm                  | 7,415     | 23          | 24       | -8         | -103       | -51          | -18          | -106                 | 62       | 845         | 3,918              | 2,834             | -5          | 44            | -44         | -     |
| Black ash            | 8,383     | -           | -        | 19         | 236        | 15           | 7            | 145                  | 1        | 83          | 4,920              | 2,116             | 630         | 29            | 182         | -     |
| White & green ash    | 33,068    | 29          | 164      | 8          | 37         | 7            | -            | 221                  | 14       | 1,497       | 9,129              | 20,500            | 1,265       | 169           | 28          | -     |
| Sycamore             | 456       | -           | -        | -          | -          | -            | -            | -                    | -        | 16          | 337                | 103               | -           | -             | 14          | -     |
| Cottonwood           | 5,224     | 13          | -        | -          | -          | -            | -            | 5                    | -        | 227         | 3,297              | 1,538             | 120         | 10            | 14          | -     |
| Willow               | 773       | -           | 7        | -          | -          | 3            | -            | -                    | -        | 22          | 444                | 230               | 53          | 5             | 9           | -     |
| Hackberry            | 173       | -           | -        | -          | -          | -            | -            | -                    | -        | 53          | 52                 | 68                | -           | -             | -           | -     |
| Balsam poplar        | 6,181     | 212         | 47       | -46        | 112        | 54           | 97           | -261                 | 45       | 64          | 246                | 441               | 1,936       | 350           | 2,884       | -     |
| Bigtooth aspen       | 40,817    | 133         | 706      | 366        | 131        | 1            | 31           | 16                   | -1       | 4,726       | 825                | 8,223             | 25,184      | 392           | 84          | -     |
| Quaking aspen        | 57,148    | 651         | 787      | 300        | 1,896      | 733          | 832          | -312                 | -12      | 1,095       | 1,548              | 11,384            | 36,925      | 788           | 521         | 12    |
| Paper birch          | 13,196    | 73          | 75       | 162        | 887        | 415          | 190          | 68                   | 100      | 338         | 468                | 2,918             | 3,889       | 3,557         | 56          | -     |
| Tupelo               | 293       | -           | -        | -          | -          | -            | -            | -                    | -        | 90          | 139                | 34                | 17          | 13            | -           | -     |
| Black cherry         | 14,445    | 379         | 264      | 84         | 75         | -45          | 14           | 37                   | 28       | 1,916       | 992                | 9,775             | 897         | 19            | 10          | -     |
| Black walnut         | 1,758     | -           | 4        | -          | -          | -            | -            | -                    | -        | 816         | 47                 | 891               | -           | -             | -           | -     |
| Butternut            | 195       | -           | -        | -          | -          | -            | -            | 9                    | -        | 88          | 11                 | 87                | -           | -             | -           | -     |
| Yellow-poplar        | 1,332     | 33          | 4        | -          | -          | -            | -            | -                    | -        | 75          | 178                | 1,042             | -           | -             | -           | -     |
| Sassafras            | 2,191     | 67          | -        | -          | -          | -            | -            | -                    | -        | 564         | -20                | 1,552             | 28          | -             | -           | -     |
| Other hardwoods      | 1,910     | -           | 43       | -          | 5          | -            | -            | -3                   | -        | 201         | 702                | 918               | 44          | -             | -           | -     |
| Total hardwoods      | 532,203   | 3,132       | 5,041    | 2,115      | 4,928      | 1,496        | 1,402        | 1,480                | 343      | 72,449      | 55,279             | 281,269           | 91,843      | 7,511         | 3,903       | 12    |
| All species          | 760,415   | 22,785      | 73,594   | 11,962     | 17,032     | 7,565        | 9,532        | 32,471               | 2,753    | 79,079      | 61,290             | 315,925           | 109,888     | 10,922        | 5,467       | 150   |

Table 63. -- Average net annual growth of sawtimber on timberland by species group and forest type, Michigan, 1980-1992

(In thousand board feet)<sup>1</sup>

| Species group        | All types | Forest type  |             |               |               |                 |                 |                         |          |                 |                        |                       |         |                |                  | Non-<br>stocked |
|----------------------|-----------|--------------|-------------|---------------|---------------|-----------------|-----------------|-------------------------|----------|-----------------|------------------------|-----------------------|---------|----------------|------------------|-----------------|
|                      |           | Jack<br>pine | Red<br>pine | White<br>pine | Balsam<br>fir | White<br>spruce | Black<br>spruce | Northern<br>white-cedar | Tamarack | Oak-<br>hickory | Elm-ash-<br>soft maple | Maple-<br>beech-birch | Aspen   | Paper<br>birch | Balsam<br>poplar |                 |
| Softwoods            |           |              |             |               |               |                 |                 |                         |          |                 |                        |                       |         |                |                  |                 |
| Jack pine            | 55,552    | 41,439       | 4,948       | 653           | 243           | 353             | 1,364           | -                       | -29      | 3,325           | 402                    | 818                   | 1,549   | 38             | -                | 449             |
| Red pine             | 242,699   | 14,211       | 185,248     | 4,910         | 1,709         | 275             | 1,435           | 604                     | 5        | 8,515           | 1,312                  | 11,827                | 11,805  | 573            | 53               | 217             |
| White pine           | 157,432   | 3,051        | 15,216      | 42,579        | 7,164         | 2,104           | 4,226           | 9,042                   | 634      | 10,077          | 3,771                  | 43,591                | 13,213  | 2,601          | 163              | -               |
| White spruce         | 80,833    | 659          | 3,113       | 904           | 15,399        | 10,272          | 4,442           | -296                    | 215      | 376             | 2,922                  | 20,239                | 19,424  | 1,948          | 1,216            | -               |
| Black spruce         | 5,797     | 29           | -35         | 213           | 1,534         | 292             | 5,156           | -3,780                  | 59       | -66             | 456                    | 891                   | 698     | 223            | 127              | -               |
| Balsam fir           | 46,338    | 206          | 513         | 458           | 13,369        | 273             | 2,510           | -3,570                  | 299      | 114             | 3,014                  | 8,614                 | 15,092  | 2,951          | 2,495            | -               |
| Hemlock              | 70,789    | -            | 425         | 288           | 676           | 40              | 214             | 2,080                   | -        | 464             | 3,590                  | 60,457                | 1,441   | 951            | 163              | -               |
| Tamarack             | 16,116    | 36           | 285         | -15           | 1,136         | 149             | 2,720           | 2,654                   | 5,859    | -               | 864                    | 1,142                 | 482     | 223            | 581              | -               |
| Eastern redcedar     | 409       | -            | -           | -             | -             | -               | -               | -                       | -        | 304             | -                      | 105                   | -       | -              | -                | -               |
| Northern white-cedar | 154,262   | 19           | 204         | 740           | 6,936         | 673             | 1,759           | 95,141                  | 1,023    | 73              | 11,646                 | 20,912                | 8,764   | 3,662          | 2,677            | 33              |
| Other softwoods      | 17,570    | 9,771        | 1,801       | 118           | 410           | 737             | -               | -                       | -        | 538             | 218                    | 3,501                 | 402     | 74             | -                | -               |
| Total softwoods      | 847,797   | 69,421       | 211,718     | 50,848        | 48,576        | 15,168          | 23,826          | 101,875                 | 8,065    | 23,720          | 28,195                 | 172,097               | 72,870  | 13,244         | 7,475            | 699             |
| Hardwoods            |           |              |             |               |               |                 |                 |                         |          |                 |                        |                       |         |                |                  |                 |
| Select white oak     | 82,414    | 291          | 1,128       | 786           | -             | -               | -               | -                       | -        | 58,402          | 5,749                  | 14,205                | 1,639   | 214            | -                | -               |
| Select red oak       | 209,222   | 2,470        | 3,410       | 1,847         | 157           | 18              | -               | -                       | 29       | 133,612         | 3,118                  | 45,614                | 17,729  | 1,137          | 81               | -               |
| Other red oak        | 44,620    | 1,065        | 1,762       | 534           | -             | -               | -               | -                       | -        | 33,413          | 1,413                  | 5,190                 | 1,197   | -              | 46               | -               |
| Select hickory       | 7,286     | -            | -           | -             | -             | -               | -               | -                       | -        | 4,101           | 242                    | 2,943                 | -       | -              | -                | -               |
| Other hickory        | 6,708     | -            | -           | -             | -             | -               | -               | -                       | -        | 3,141           | 170                    | 3,021                 | -       | -              | -                | -               |
| Basswood             | 88,004    | 350          | 66          | 19            | 255           | -               | -               | 298                     | -        | 2,094           | 2,320                  | 80,268                | 2,353   | -19            | -                | -               |
| Beech                | 54,064    | -            | 59          | -             | 91            | -               | -               | -                       | -        | 1,141           | 548                    | 51,353                | 872     | -              | -                | -               |
| Yellow birch         | 18,897    | 3            | 37          | -8            | 248           | 86              | -34             | 161                     | 3        | 68              | 294                    | 17,572                | 438     | -11            | 40               | -               |
| Hard maple           | 325,416   | 190          | 675         | 753           | 422           | 150             | -               | 572                     | -        | 2,034           | 1,004                  | 313,789               | 4,791   | 887            | 149              | -               |
| Soft maple           | 313,574   | 305          | 2,004       | 576           | 2,006         | 375             | 290             | 5,232                   | 99       | 20,525          | 82,074                 | 174,091               | 22,232  | 3,304          | 461              | -               |
| Elm                  | 11,101    | 123          | -63         | -             | -272          | -45             | -               | -324                    | 38       | 1,031           | 5,665                  | 4,933                 | 152     | 17             | -154             | -               |
| Black ash            | 13,625    | -            | 93          | 93            | 125           | -               | -               | 105                     | -        | -               | 7,269                  | 4,787                 | 976     | 58             | 212              | -               |
| White & green ash    | 110,735   | 133          | 826         | 23            | -             | 13              | -               | 470                     | -        | 4,864           | 25,915                 | 75,041                | 2,941   | 403            | 106              | -               |
| Sycamore             | 2,735     | -            | -           | -             | -             | -               | -               | 33                      | -        | 91              | 1,855                  | 789                   | -       | -              | 71               | -               |
| Cottonwood           | 24,403    | 50           | -           | -             | -             | -               | -               | -                       | -        | 1,058           | 15,281                 | 7,535                 | 375     | -              | -                | -               |
| Willow               | 3,906     | -            | -           | -             | -             | 14              | -               | -                       | -        | -84             | 3,076                  | 854                   | 21      | 25             | -                | -               |
| Hackberry            | 301       | -            | -           | -             | -             | -               | -               | -                       | -        | -               | 176                    | 125                   | -       | -              | -                | -               |
| Balsam poplar        | 21,811    | 685          | 161         | -160          | 989           | 218             | 55              | 703                     | 64       | 214             | 464                    | 1,958                 | 5,828   | 1,289          | 9,343            | -               |
| Bigtooth aspen       | 162,687   | 354          | 2,397       | 851           | 587           | 86              | 142             | -27                     | 25       | 20,540          | 2,756                  | 33,775                | 98,144  | 2,930          | 127              | -               |
| Quaking aspen        | 207,715   | 1,166        | 1,900       | 1,595         | 5,941         | 2,076           | 801             | -551                    | 35       | 3,755           | 9,981                  | 48,652                | 125,345 | 4,671          | 2,348            | -               |
| Paper birch          | 41,988    | 185          | 352         | 533           | 2,056         | 480             | 582             | 1,809                   | 127      | 542             | 3,768                  | 11,759                | 10,517  | 9,091          | 187              | -               |
| Tupelo               | 713       | -            | -           | -             | -             | -               | -               | -                       | -        | 407             | 242                    | -                     | -       | 64             | -                | -               |
| Black cherry         | 44,469    | 178          | 217         | 5             | 280           | 63              | -               | 80                      | 54       | 7,147           | 1,560                  | 33,070                | 1,682   | 36             | 97               | -               |
| Black walnut         | 6,549     | -            | 55          | -             | -             | -               | -               | -                       | -        | 3,288           | 253                    | 2,953                 | -       | -              | -                | -               |
| Butternut            | 954       | -            | -           | -             | -             | -               | -               | 45                      | -        | 364             | -21                    | 566                   | -       | -              | -                | -               |
| Yellow-poplar        | 6,036     | 162          | -           | -             | -             | -               | -               | -                       | -        | 465             | 719                    | 4,690                 | -       | -              | -                | -               |
| Sassafras            | 4,451     | -            | -           | -             | -             | -               | -               | -                       | -        | 1,331           | 396                    | 2,670                 | 54      | -              | -                | -               |
| Other hardwoods      | 3,007     | -            | -           | -             | -             | -               | -               | -29                     | -        | 161             | 1,144                  | 1,731                 | -       | -              | -                | -               |
| Total hardwoods      | 1,817,391 | 8,086        | 14,986      | 7,447         | 12,885        | 3,534           | 1,836           | 8,577                   | 474      | 303,705         | 177,431                | 943,934               | 297,286 | 24,096         | 13,114           | -               |
| All species          | 2,665,188 | 77,507       | 226,704     | 58,295        | 61,461        | 18,702          | 25,662          | 110,452                 | 8,539    | 327,425         | 205,626                | 1,116,031             | 370,156 | 37,340         | 20,589           | 699             |

International 1/4-inch rule.

<sup>1</sup> International 1/4-inch rule.

Table 64. -- Current net annual growth, current annual mortality, and current annual removals of growing stock and sawtimber on timberland by species group, Michigan, 1992

| Species group        | Growing stock                                |                                |                                            | Sawtimber                                    |                                |                                            |
|----------------------|----------------------------------------------|--------------------------------|--------------------------------------------|----------------------------------------------|--------------------------------|--------------------------------------------|
|                      | Current<br>net annual<br>growth <sup>1</sup> | Current<br>annual<br>mortality | Current<br>annual<br>removals <sup>2</sup> | Current<br>net annual<br>growth <sup>1</sup> | Current<br>annual<br>mortality | Current<br>annual<br>removals <sup>2</sup> |
|                      | 1992                                         | 1992                           | 1992                                       | 1992                                         | 1992                           | 1992                                       |
|                      | (In thousand cubic feet)                     |                                |                                            | (In thousand board feet) <sup>3</sup>        |                                |                                            |
| Softwoods            |                                              |                                |                                            |                                              |                                |                                            |
| Jack pine            | 10,995                                       | 12,803                         | 25,520                                     | 52,687                                       | 30,681                         | 66,122                                     |
| Red pine             | 82,601                                       | 336                            | 23,669                                     | 327,633                                      | 2,421                          | 111,035                                    |
| White pine           | 37,266                                       | 1,317                          | 5,948                                      | 181,389                                      | 6,995                          | 28,795                                     |
| White spruce         | 26,045                                       | 4,538                          | 4,070                                      | 115,469                                      | 19,653                         | 11,066                                     |
| Black spruce         | 3,604                                        | 8,791                          | 2,833                                      | 6,349                                        | 14,673                         | 7,329                                      |
| Balsam fir           | 18,031                                       | 23,607                         | 7,979                                      | 62,869                                       | 42,765                         | 20,196                                     |
| Hemlock              | 12,964                                       | 2,658                          | 3,438                                      | 72,106                                       | 10,539                         | 10,963                                     |
| Tamarack             | 4,933                                        | 1,844                          | 719                                        | 20,237                                       | 3,831                          | 1,799                                      |
| Eastern redcedar     | 275                                          | 1                              | -                                          | 427                                          | 9                              | -                                          |
| Northern white-cedar | 45,076                                       | 2,133                          | 9,949                                      | 153,686                                      | 13,810                         | 25,633                                     |
| Other softwoods      | 7,226                                        | 55                             | 485                                        | 22,571                                       | 131                            | 1,291                                      |
| Total softwoods      | 249,016                                      | 58,083                         | 84,610                                     | 1,015,423                                    | 145,508                        | 284,229                                    |
| Hardwoods            |                                              |                                |                                            |                                              |                                |                                            |
| Select white oak     | 20,886                                       | 100                            | 6,212                                      | 89,497                                       | 1,393                          | 22,256                                     |
| Other white oak      | 25                                           | -                              | -                                          | -                                            | -                              | -                                          |
| Select red oak       | 43,554                                       | 8,653                          | 23,560                                     | 213,898                                      | 19,194                         | 97,071                                     |
| Other red oak        | 10,039                                       | 2,652                          | 5,227                                      | 45,993                                       | 6,638                          | 22,492                                     |
| Select hickory       | 2,075                                        | 358                            | 119                                        | 8,593                                        | 1,042                          | 627                                        |
| Other hickory        | 1,625                                        | 265                            | 292                                        | 6,007                                        | 595                            | 1,630                                      |
| Basswood             | 19,923                                       | 4,940                          | 8,012                                      | 87,619                                       | 14,360                         | 31,937                                     |
| Beech                | 14,117                                       | 993                            | 5,342                                      | 60,033                                       | 4,002                          | 21,039                                     |
| Yellow birch         | 4,231                                        | 7,415                          | 3,584                                      | 14,026                                       | 24,369                         | 14,282                                     |
| Hard maple           | 117,018                                      | 12,319                         | 42,370                                     | 372,909                                      | 27,949                         | 169,112                                    |
| Soft maple           | 114,759                                      | 14,153                         | 35,938                                     | 350,782                                      | 28,363                         | 94,327                                     |
| Elm                  | 17,159                                       | 6,395                          | 1,043                                      | 37,818                                       | 13,878                         | 2,113                                      |
| Black ash            | 9,757                                        | 3,536                          | 2,268                                      | 15,726                                       | 4,721                          | 7,523                                      |
| White & green ash    | 38,385                                       | 2,970                          | 4,229                                      | 130,183                                      | 4,209                          | 17,892                                     |
| Sycamore             | 569                                          | 74                             | 179                                        | 3,090                                        | 350                            | 888                                        |
| Cottonwood           | 4,536                                        | 624                            | 1,080                                      | 22,944                                       | 2,642                          | 4,992                                      |
| Willow               | 1,191                                        | 160                            | 123                                        | 3,990                                        | 522                            | 126                                        |
| Hackberry            | 120                                          | 24                             | 420                                        | 186                                          | 27                             | 2,088                                      |
| Balsam poplar        | 7,885                                        | 7,775                          | 6,139                                      | 36,757                                       | 20,966                         | 10,090                                     |
| Bigtooth aspen       | 44,178                                       | 16,914                         | 46,591                                     | 178,591                                      | 45,081                         | 116,246                                    |
| Quaking aspen        | 67,327                                       | 38,478                         | 62,331                                     | 252,072                                      | 83,796                         | 133,445                                    |
| Paper birch          | 14,053                                       | 10,159                         | 15,690                                     | 52,702                                       | 16,029                         | 29,725                                     |
| Tupelo               | 311                                          | 37                             | -                                          | 623                                          | 59                             | -                                          |
| Black cherry         | 14,933                                       | 2,178                          | 3,747                                      | 53,707                                       | 2,669                          | 10,452                                     |
| Black walnut         | 1,570                                        | 150                            | 499                                        | 6,270                                        | 385                            | 2,667                                      |
| Butternut            | 295                                          | 22                             | 43                                         | 1,901                                        | 68                             | 211                                        |
| Yellow-poplar        | 1,086                                        | 92                             | 395                                        | 4,855                                        | 347                            | 1,963                                      |
| Sassafras            | 2,477                                        | 564                            | 175                                        | 4,760                                        | 698                            | 304                                        |
| Other hardwoods      | 1,910                                        | 291                            | 259                                        | 4,084                                        | 346                            | 878                                        |
| Total hardwoods      | 575,994                                      | 142,291                        | 275,867                                    | 2,059,616                                    | 324,698                        | 816,376                                    |
| All species          | 825,010                                      | 200,374                        | 360,477                                    | 3,075,039                                    | 470,206                        | 1,100,605                                  |

<sup>1</sup> An estimate of current gross growth may be computed by adding current mortality to current net growth.

<sup>2</sup> Based on data from a 1992 mill survey (in process), a logging utilization study (in process), and land-use change estimates from the new inventory.

<sup>3</sup> International 1/4-inch rule.

Table 65. -- Current annual removals for 1979 and 1992, and average annual removals for 1980-1992 from growing stock and sawtimber on timberland by softwoods and hardwoods and Forest Survey Unit, Michigan

| Forest Survey Unit<br>and softwoods<br>and hardwoods | Growing stock                   |                               |                               | Sawtimber                                    |                               |                               |
|------------------------------------------------------|---------------------------------|-------------------------------|-------------------------------|----------------------------------------------|-------------------------------|-------------------------------|
|                                                      | Current<br>annual<br>removals   | Average<br>annual<br>removals | Current<br>annual<br>removals | Current<br>annual<br>removals                | Average<br>annual<br>removals | Current<br>annual<br>removals |
|                                                      | 1979 <sup>1</sup>               | 1980-1992 <sup>2</sup>        | 1992 <sup>1</sup>             | 1979 <sup>1</sup>                            | 1980-1992 <sup>2</sup>        | 1992 <sup>1</sup>             |
|                                                      | <i>(In thousand cubic feet)</i> |                               |                               | <i>(In thousand board feet) <sup>3</sup></i> |                               |                               |
| Eastern Upper Peninsula                              |                                 |                               |                               |                                              |                               |                               |
| Softwoods                                            | 21,146                          | 24,255                        | 26,979                        | 58,426                                       | 64,664                        | 76,740                        |
| Hardwoods                                            | 33,352                          | 30,707                        | 45,281                        | 113,880                                      | 85,321                        | 106,384                       |
| Total                                                | 54,498                          | 54,962                        | 72,260                        | 172,306                                      | 149,985                       | 183,124                       |
| Western Upper Peninsula                              |                                 |                               |                               |                                              |                               |                               |
| Softwoods                                            | 18,003                          | 20,896                        | 23,142                        | 58,186                                       | 78,477                        | 64,569                        |
| Hardwoods                                            | 60,299                          | 61,634                        | 87,108                        | 185,622                                      | 185,883                       | 233,577                       |
| Total                                                | 78,302                          | 82,530                        | 110,250                       | 243,808                                      | 264,360                       | 298,146                       |
| Northern Lower Peninsula                             |                                 |                               |                               |                                              |                               |                               |
| Softwoods                                            | 15,249                          | 26,446                        | 32,427                        | 44,278                                       | 62,766                        | 132,388                       |
| Hardwoods                                            | 89,275                          | 75,472                        | 114,824                       | 281,006                                      | 176,976                       | 354,145                       |
| Total                                                | 104,524                         | 101,918                       | 147,251                       | 325,284                                      | 239,742                       | 486,533                       |
| Southern Lower Peninsula                             |                                 |                               |                               |                                              |                               |                               |
| Softwoods                                            | 1,969                           | 4,538                         | 2,062                         | 4,303                                        | 16,893                        | 10,532                        |
| Hardwoods                                            | 35,303                          | 30,368                        | 28,654                        | 169,812                                      | 105,541                       | 122,270                       |
| Total                                                | 37,272                          | 34,906                        | 30,716                        | 174,115                                      | 122,434                       | 132,802                       |
| All Units                                            |                                 |                               |                               |                                              |                               |                               |
| Softwoods                                            | 56,367                          | 76,135                        | 84,610                        | 165,193                                      | 222,800                       | 284,229                       |
| Hardwoods                                            | 218,229                         | 198,181                       | 275,867                       | 750,320                                      | 553,721                       | 816,376                       |
| Total                                                | 274,596                         | 274,316                       | 360,477                       | 915,513                                      | 776,521                       | 1,100,605                     |

<sup>1</sup> Based on data from a mill survey and a logging utilization study (in process) for given years, and land use change estimates from the plot inventory.

<sup>2</sup> Average of field plot level removals between the study periods.

<sup>3</sup> International 1/4-inch rule.

Table 66. -- Current annual mortality for 1979 and 1992, and average annual mortality for 1980-1992 of growing stock and sawtimber on timberland by softwoods and hardwoods, and Forest Survey Unit, Michigan

| Forest Survey Unit<br>and softwoods<br>and hardwoods | Growing stock                   |                                |                                | Sawtimber                                    |                                |                                |
|------------------------------------------------------|---------------------------------|--------------------------------|--------------------------------|----------------------------------------------|--------------------------------|--------------------------------|
|                                                      | Current<br>annual<br>mortality  | Average<br>annual<br>mortality | Current<br>annual<br>mortality | Current<br>annual<br>mortality               | Average<br>annual<br>mortality | Current<br>annual<br>mortality |
|                                                      | 1979                            | 1980-1992                      | 1992                           | 1979                                         | 1980-1992                      | 1992                           |
|                                                      | <i>(In thousand cubic feet)</i> |                                |                                | <i>(In thousand board feet)</i> <sup>1</sup> |                                |                                |
| Eastern Upper Peninsula                              |                                 |                                |                                |                                              |                                |                                |
| Softwoods                                            | 17,407                          | 19,369                         | 19,974                         | 34,976                                       | 40,855                         | 48,126                         |
| Hardwoods                                            | 19,460                          | 23,543                         | 24,526                         | 36,780                                       | 47,169                         | 54,467                         |
| Total                                                | 36,867                          | 42,912                         | 44,500                         | 71,756                                       | 88,024                         | 102,593                        |
| Western Upper Peninsula                              |                                 |                                |                                |                                              |                                |                                |
| Softwoods                                            | 20,554                          | 24,316                         | 22,153                         | 49,085                                       | 63,549                         | 58,075                         |
| Hardwoods                                            | 35,200                          | 39,645                         | 39,968                         | 74,843                                       | 93,805                         | 98,089                         |
| Total                                                | 55,754                          | 63,961                         | 62,121                         | 123,928                                      | 157,354                        | 156,164                        |
| Northern Lower Peninsula                             |                                 |                                |                                |                                              |                                |                                |
| Softwoods                                            | 14,115                          | 17,304                         | 14,896                         | 24,963                                       | 35,715                         | 35,664                         |
| Hardwoods                                            | 39,145                          | 52,570                         | 57,872                         | 70,402                                       | 107,999                        | 126,506                        |
| Total                                                | 53,260                          | 69,874                         | 72,768                         | 95,365                                       | 143,714                        | 162,170                        |
| Southern Lower Peninsula                             |                                 |                                |                                |                                              |                                |                                |
| Softwoods                                            | 643                             | 1,256                          | 1,060                          | 1,865                                        | 3,017                          | 3,643                          |
| Hardwoods                                            | 10,033                          | 20,490                         | 19,925                         | 20,357                                       | 43,877                         | 45,636                         |
| Total                                                | 10,676                          | 21,746                         | 20,985                         | 22,222                                       | 46,894                         | 49,279                         |
| All Units                                            |                                 |                                |                                |                                              |                                |                                |
| Softwoods                                            | 52,719                          | 62,245                         | 58,083                         | 110,889                                      | 143,136                        | 145,508                        |
| Hardwoods                                            | 103,838                         | 136,248                        | 142,291                        | 202,382                                      | 292,850                        | 324,698                        |
| Total                                                | 156,557                         | 198,493                        | 200,374                        | 313,271                                      | 435,986                        | 470,206                        |

<sup>1</sup> International 1/4-inch rule.

Table 67. -- Average annual mortality of growing stock on timberland by species group and cause of death, Michigan, 1980-1992  
(In thousand cubic feet)

| Species group        | All causes | Cause of death |         |         |         |      |             | Human caused | Other and unknown |
|----------------------|------------|----------------|---------|---------|---------|------|-------------|--------------|-------------------|
|                      |            | Insects        | Disease | Weather | Animals | Fire | Suppression | Vine damage  |                   |
| Softwoods            |            |                |         |         |         |      |             |              |                   |
| Jack pine            | 11,201     | 289            | 138     | 30      | 96      | 121  | 49          | -            | 44                |
| Red pine             | 577        | 10             | 10      | 23      | -       | 20   | -           | -            | 7                 |
| White pine           | 2,229      | 33             | 143     | 182     | 1       | 21   | 2           | -            | 45                |
| White spruce         | 5,302      | 30             | 207     | 330     | 23      | -    | 8           | -            | 75                |
| Black spruce         | 7,841      | 77             | 234     | 303     | 1       | -    | 16          | -            | 73                |
| Balsam fir           | 26,038     | 133            | 748     | 921     | 33      | 11   | 72          | 25           | 288               |
| Hemlock              | 2,558      | -              | 107     | 50      | 28      | -    | 6           | -            | 51                |
| Tamarack             | 1,710      | 19             | 49      | 174     | 48      | 5    | 2           | -            | 8                 |
| Eastern redcedar     | 1          | -              | -       | -       | -       | -    | -           | -            | -                 |
| Northern white-cedar | 4,356      | -              | 124     | 489     | 1       | 4    | 4           | -            | 85                |
| Other softwoods      | 432        | -              | -       | -       | -       | -    | 29          | -            | 3,649             |
| Total softwoods      | 62,245     | 591            | 1,760   | 2,502   | 231     | 182  | 188         | 25           | 676               |
| Hardwoods            |            |                |         |         |         |      |             |              |                   |
| Select white oak     | 984        | -              | 77      | 17      | -       | -    | -           | -            | 890               |
| Select red oak       | 6,664      | 283            | 87      | 71      | 2       | 5    | 7           | 7            | 6,122             |
| Other red oak        | 1,879      | 53             | 100     | -       | -       | -    | -           | 19           | 1,692             |
| Select hickory       | 444        | -              | -       | -       | -       | -    | -           | 3            | 441               |
| Other hickory        | 290        | -              | 3       | -       | -       | -    | -           | 5            | 278               |
| Basswood             | 4,053      | 57             | 124     | 202     | 1       | -    | -           | 9            | 3,647             |
| Beech                | 856        | 8              | 50      | 64      | 1       | -    | -           | -            | 728               |
| Yellow birch         | 6,860      | 29             | 566     | 65      | 11      | 12   | 4           | -            | 69                |
| Hard maple           | 8,868      | 67             | 301     | 217     | -       | -    | 19          | 3            | 8,149             |
| Soft maple           | 10,789     | 38             | 406     | 679     | 76      | 11   | 8           | 20           | 9,372             |
| Elm                  | 14,286     | 5              | 7,804   | 79      | 6       | -    | 3           | 136          | 37                |
| Black ash            | 3,188      | 1              | 21      | 198     | 90      | -    | -           | 2            | 2,854             |
| White & green ash    | 2,832      | 18             | 55      | 158     | 3       | -    | -           | 14           | 2,555             |
| Sycamore             | 26         | -              | -       | -       | -       | -    | -           | -            | 25                |
| Cottonwood           | 350        | -              | 9       | -       | -       | -    | -           | 10           | 330               |
| Willow               | 433        | -              | 5       | 13      | -       | -    | -           | 3            | 412               |
| Hackberry            | 12         | -              | -       | -       | -       | -    | -           | 8            | 4                 |
| Balsam poplar        | 8,258      | 67             | 234     | 223     | 11      | -    | -           | 7            | 7,707             |
| Bigtooth aspen       | 13,711     | 279            | 475     | 63      | 122     | -    | 1           | 21           | 124               |
| Quaking aspen        | 37,265     | 495            | 3,132   | 929     | 376     | 16   | 2           | 13           | 32,131            |
| Paper birch          | 11,119     | 166            | 440     | 167     | 27      | -    | 1           | 2            | 91                |
| Tupelo               | 7          | -              | -       | -       | -       | -    | -           | -            | 1                 |
| Black cherry         | 2,221      | 48             | 70      | 96      | -       | -    | -           | 8            | 85                |
| Black walnut         | 182        | -              | 3       | -       | -       | -    | -           | 5            | 173               |
| Butternut            | 71         | -              | -       | -       | -       | -    | -           | -            | 71                |
| Yellow-poplar        | 63         | -              | 1       | -       | -       | -    | -           | 1            | 60                |
| Sassafras            | 370        | -              | 10      | 13      | -       | -    | -           | 11           | 317               |
| Other hardwoods      | 167        | -              | 6       | -       | -       | -    | -           | 6            | 155               |
| Total hardwoods      | 136,248    | 1,614          | 13,999  | 3,254   | 726     | 44   | 45          | 313          | 1,069             |
| All species          | 198,493    | 2,205          | 15,759  | 5,756   | 957     | 226  | 233         | 330          | 1,745             |

Table 68. -- Average annual mortality of sawtimber on timberland by species group and cause of death, Michigan, 1980-1992

(In thousand board feet)<sup>1</sup>

| Species group          | All causes     | Cause of death |               |               |              |            |             | Vine damage | Human caused | Other and unknown |
|------------------------|----------------|----------------|---------------|---------------|--------------|------------|-------------|-------------|--------------|-------------------|
|                        |                | Insects        | Disease       | Weather       | Animals      | Fire       | Suppression |             |              |                   |
| <b>Softwoods</b>       |                |                |               |               |              |            |             |             |              |                   |
| Jack pine              | 23,515         | 500            | 384           | 30            | 403          | 273        | 103         | -           | 103          | 21,719            |
| Red pine               | 1,809          | 54             | 62            | 117           | -            | 106        | -           | -           | 3            | 1,467             |
| White pine             | 9,403          | 167            | 279           | 978           | 15           | 113        | -           | -           | 137          | 7,714             |
| White spruce           | 20,782         | 128            | 616           | 1,450         | 123          | -          | 1           | -           | 87           | 18,377            |
| Black spruce           | 12,537         | 104            | 667           | 365           | 5            | -          | -           | -           | 4            | 11,392            |
| Balsam fir             | 45,547         | 154            | 1,719         | 1,874         | 99           | 21         | -           | -           | 263          | 41,417            |
| Hemlock                | 12,073         | 2              | 584           | 264           | 210          | -          | 19          | -           | 244          | 10,770            |
| Tamarack               | 3,985          | -              | 171           | 611           | 109          | 24         | -           | -           | 18           | 3,052             |
| Eastern redcedar       | 8              | -              | -             | -             | -            | -          | -           | -           | -            | 8                 |
| Northern white-cedar   | 13,365         | 1              | 753           | 1,203         | 19           | 20         | -           | 1           | 56           | 11,312            |
| Other softwoods        | 112            | -              | -             | -             | 2            | -          | 43          | -           | -            | 67                |
| <b>Total softwoods</b> | <b>143,136</b> | <b>1,110</b>   | <b>5,215</b>  | <b>6,892</b>  | <b>985</b>   | <b>557</b> | <b>166</b>  | <b>1</b>    | <b>915</b>   | <b>127,295</b>    |
| <b>Hardwoods</b>       |                |                |               |               |              |            |             |             |              |                   |
| Select white oak       | 3,166          | 22             | 339           | 76            | -            | 2          | -           | 10          | 18           | 2,699             |
| Select red oak         | 13,412         | 585            | 207           | 218           | -            | -          | -           | 16          | 150          | 12,236            |
| Other red oak          | 4,445          | 90             | 520           | -             | 2            | -          | -           | 61          | 54           | 3,718             |
| Select hickory         | 1,376          | -              | 3             | -             | -            | -          | -           | 9           | -            | 1,364             |
| Other hickory          | 799            | -              | 13            | -             | -            | -          | -           | 13          | 6            | 767               |
| Basswood               | 11,289         | 185            | 480           | 672           | 10           | -          | -           | 26          | 30           | 9,886             |
| Beech                  | 2,883          | 25             | 196           | 293           | 16           | -          | -           | -           | 27           | 2,326             |
| Yellow birch           | 22,260         | 3              | 2,218         | 77            | 49           | 27         | 15          | -           | 100          | 19,771            |
| Hard maple             | 21,450         | 251            | 1,161         | 416           | 18           | -          | -           | 7           | 211          | 19,386            |
| Soft maple             | 23,506         | 82             | 1,239         | 1,769         | 227          | -          | -           | 38          | 160          | 19,991            |
| Elm                    | 28,641         | -              | 15,447        | 313           | 16           | -          | -           | 441         | 44           | 12,380            |
| Black ash              | 4,549          | -              | 59            | 370           | 111          | -          | -           | 2           | 4            | 4,003             |
| White & green ash      | 5,729          | 80             | 184           | 228           | -            | -          | -           | 44          | 26           | 5,167             |
| Sycamore               | 44             | -              | -             | -             | -            | -          | -           | -           | -            | 44                |
| Cottonwood             | 1,333          | -              | 41            | -             | -            | -          | -           | 39          | -            | 1,253             |
| Willow                 | 1,331          | -              | 10            | 40            | -            | -          | -           | 5           | -            | 1,276             |
| Hackberry              | 6              | -              | -             | -             | -            | -          | -           | 6           | -            | -                 |
| Balsam poplar          | 23,419         | 60             | 574           | 584           | 9            | -          | -           | 31          | -            | 22,161            |
| Bigtooth aspen         | 30,575         | 615            | 1,253         | 42            | 192          | -          | -           | 92          | 168          | 28,213            |
| Quaking aspen          | 74,557         | 794            | 5,915         | 2,013         | 782          | -          | -           | 26          | 221          | 64,806            |
| Paper birch            | 14,699         | 111            | 685           | 98            | 47           | -          | -           | -           | 84           | 13,674            |
| Tupelo                 | 7              | -              | -             | -             | -            | -          | -           | -           | -            | 7                 |
| Black cherry           | 1,834          | 20             | 153           | 82            | -            | -          | -           | 9           | 21           | 1,549             |
| Black walnut           | 740            | -              | 12            | -             | -            | -          | -           | 18          | -            | 710               |
| Butternut              | 174            | -              | 7             | -             | -            | -          | -           | -           | -            | 167               |
| Yellow-poplar          | 146            | -              | 4             | -             | -            | -          | -           | 2           | 3            | 137               |
| Sassafras              | 409            | -              | 33            | -             | -            | -          | -           | 17          | 7            | 352               |
| Other hardwoods        | 71             | -              | 17            | -             | -            | -          | -           | 7           | -            | 47                |
| <b>Total hardwoods</b> | <b>292,850</b> | <b>2,923</b>   | <b>30,770</b> | <b>7,291</b>  | <b>1,479</b> | <b>29</b>  | <b>15</b>   | <b>919</b>  | <b>1,334</b> | <b>248,090</b>    |
| <b>All species</b>     | <b>435,986</b> | <b>4,033</b>   | <b>35,985</b> | <b>14,183</b> | <b>2,464</b> | <b>586</b> | <b>181</b>  | <b>920</b>  | <b>2,249</b> | <b>375,385</b>    |

<sup>1</sup>International 1/4-inch rule.

Table 69. -- Current annual timber removals of growing stock and sawtimber on timberland by species group, product, logging residue, and other removals, Michigan, 1992

| Species group        | Growing stock                 |                       |          |             |          |                                 |                          |                         |                |                 | Nonproduct removals |  |  |
|----------------------|-------------------------------|-----------------------|----------|-------------|----------|---------------------------------|--------------------------|-------------------------|----------------|-----------------|---------------------|--|--|
|                      | Removals for products (Items) |                       |          |             |          |                                 |                          |                         |                |                 |                     |  |  |
|                      | All removals                  | All products removals | Saw logs | Veneer logs | Pulpwood | Composite products <sup>1</sup> | Fuelwood                 | Posts, poles, & pilings | Misc. products | Logging residue | Other removals      |  |  |
|                      |                               |                       |          |             |          |                                 | (in thousand cubic feet) |                         |                |                 |                     |  |  |
| <b>Softwoods</b>     |                               |                       |          |             |          |                                 |                          |                         |                |                 |                     |  |  |
| Jack pine            | 25,520                        | 23,611                | 2,567    | 5           | 13,039   | 5,848                           | 2,126                    | 26                      | -              | 1,369           | 540                 |  |  |
| Red pine             | 23,669                        | 22,197                | 14,916   | 29          | 3,306    | 883                             | 2,500                    | 208                     | 355            | 1,010           | 462                 |  |  |
| White pine           | 5,948                         | 4,268                 | 2,949    | 99          | 890      | 49                              | 114                      | 22                      | 145            | 226             | 1,454               |  |  |
| White spruce         | 4,070                         | 3,320                 | 182      | 10          | 3,096    | 24                              | 1                        | 1                       | 6              | 443             | 307                 |  |  |
| Black spruce         | 2,833                         | 2,279                 | 89       | 10          | 2,155    | 17                              | -                        | 2                       | 6              | 303             | 251                 |  |  |
| Balsam fir           | 7,979                         | 6,425                 | 213      | -           | 6,101    | 108                             | 3                        | -                       | -              | 845             | 709                 |  |  |
| Hemlock              | 3,438                         | 2,961                 | 472      | 22          | 2,441    | 1                               | 25                       | -                       | -              | 142             | 335                 |  |  |
| Tamarack             | 719                           | 543                   | 4        | 2           | 532      | -                               | 5                        | -                       | -              | 72              | 104                 |  |  |
| Northern white-cedar | 9,949                         | 6,117                 | 1,951    | -           | 445      | 14                              | 11                       | 3,201                   | 495            | 982             | 2,850               |  |  |
| Other softwoods      | 485                           | 291                   | -        | -           | -        | 288                             | 1                        | 2                       | -              | -               | 194                 |  |  |
| Total softwoods      | 84,610                        | 72,012                | 23,343   | 177         | 32,005   | 7,232                           | 4,786                    | 3,462                   | 1,007          | 5,392           | 7,206               |  |  |
| <b>Hardwoods</b>     |                               |                       |          |             |          |                                 |                          |                         |                |                 |                     |  |  |
| Select white oak     | 6,212                         | 5,333                 | 3,100    | 165         | 1,620    | -                               | 448                      | -                       | -              | 470             | 409                 |  |  |
| Select red oak       | 23,560                        | 20,294                | 13,950   | 576         | 2,616    | 512                             | 2,610                    | 30                      | -              | 1,994           | 1,272               |  |  |
| Other red oak        | 5,227                         | 4,285                 | 3,304    | 70          | 413      | 62                              | 436                      | -                       | -              | 436             | 506                 |  |  |
| Select hickory       | 119                           | 103                   | 99       | -           | -        | -                               | 4                        | -                       | -              | 16              | -                   |  |  |
| Other hickory        | 292                           | 86                    | 82       | 1           | -        | -                               | 3                        | -                       | -              | 14              | 192                 |  |  |
| Basswood             | 8,012                         | 6,597                 | 4,512    | 164         | 1,766    | 126                             | 29                       | -                       | -              | 1,202           | 213                 |  |  |
| Beech                | 5,342                         | 4,168                 | 1,830    | 417         | 1,713    | 90                              | 118                      | -                       | -              | 633             | 541                 |  |  |
| Yellow birch         | 3,584                         | 2,769                 | 1,344    | 173         | 1,189    | -                               | 63                       | -                       | -              | 411             | 404                 |  |  |
| Hard maple           | 42,370                        | 35,744                | 16,061   | 2,122       | 15,185   | 995                             | 1,379                    | -                       | 2              | 5,181           | 1,445               |  |  |
| Soft maple           | 35,938                        | 28,343                | 9,297    | 263         | 13,951   | 2,947                           | 1,883                    | -                       | 2              | 4,104           | 3,491               |  |  |
| Elm                  | 1,043                         | 700                   | 128      | 7           | 204      | -                               | 361                      | -                       | -              | 59              | 284                 |  |  |
| Black ash            | 2,268                         | 1,479                 | 826      | 54          | 375      | 20                              | 204                      | -                       | -              | 195             | 594                 |  |  |
| White & green ash    | 4,229                         | 3,559                 | 2,171    | 140         | 911      | 25                              | 312                      | -                       | -              | 482             | 188                 |  |  |
| Sycamore             | 179                           | 147                   | 147      | -           | -        | -                               | -                        | -                       | -              | 32              | -                   |  |  |
| Cottonwood           | 1,080                         | 612                   | 573      | 7           | 4        | -                               | 28                       | -                       | -              | 125             | 343                 |  |  |
| Willow               | 123                           | 1                     | -        | -           | -        | -                               | 1                        | -                       | -              | -               | 122                 |  |  |
| Hackberry            | 420                           | 346                   | 346      | -           | -        | -                               | -                        | -                       | -              | 74              | -                   |  |  |
| Balsam poplar        | 6,139                         | 5,156                 | 171      | 2           | 2,279    | 2,704                           | -                        | -                       | -              | 743             | 240                 |  |  |
| Bigtooth aspen       | 46,591                        | 42,808                | 11,817   | 129         | 14,913   | 14,588                          | 1,313                    | -                       | 48             | 3,050           | 733                 |  |  |
| Quaking aspen        | 62,331                        | 56,199                | 8,640    | 776         | 23,391   | 22,426                          | 688                      | -                       | 278            | 3,963           | 2,169               |  |  |
| Paper birch          | 15,690                        | 12,323                | 1,586    | 220         | 9,541    | 859                             | 117                      | -                       | -              | 1,768           | 1,599               |  |  |
| Black cherry         | 3,747                         | 3,054                 | 1,058    | 84          | 1,756    | -                               | 156                      | -                       | -              | 491             | 202                 |  |  |
| Black walnut         | 499                           | 427                   | 373      | 47          | -        | -                               | 7                        | -                       | -              | 72              | -                   |  |  |
| Butternut            | 43                            | 35                    | 35       | -           | -        | -                               | -                        | -                       | -              | 8               | -                   |  |  |
| Yellow-poplar        | 395                           | 325                   | 321      | 4           | -        | -                               | -                        | -                       | -              | 70              | -                   |  |  |
| Sassafras            | 175                           | 3                     | 2        | -           | -        | -                               | 1                        | -                       | -              | -               | 172                 |  |  |
| Other hardwoods      | 259                           | 239                   | 78       | 2           | 10       | -                               | 137                      | 12                      | -              | 20              | -                   |  |  |
| Total hardwoods      | 275,867                       | 235,135               | 81,851   | 5,423       | 91,837   | 45,354                          | 10,298                   | 42                      | 330            | 25,613          | 15,119              |  |  |
| All species          | 360,477                       | 307,147               | 105,194  | 5,600       | 123,842  | 52,586                          | 15,084                   | 3,504                   | 1,337          | 31,005          | 22,325              |  |  |

(Table 69 continued)

| Species group                               | Sawtimber             |                       |          |             |          |                                 |          |                         |                |                 |                | Nonproduct removals |  |  |
|---------------------------------------------|-----------------------|-----------------------|----------|-------------|----------|---------------------------------|----------|-------------------------|----------------|-----------------|----------------|---------------------|--|--|
|                                             | Removals for products |                       |          |             |          |                                 |          |                         |                |                 |                |                     |  |  |
|                                             | All removals          | All products removals | Saw logs | Veneer logs | Pulpwood | Composite products <sup>1</sup> | Fuelwood | Posts, poles, & pilings | Misc. products | Logging residue | Other removals |                     |  |  |
| <i>(In thousand board feet)<sup>2</sup></i> |                       |                       |          |             |          |                                 |          |                         |                |                 |                |                     |  |  |
| Softwoods                                   |                       |                       |          |             |          |                                 |          |                         |                |                 |                |                     |  |  |
| Jack pine                                   | 66,122                | 65,007                | 13,303   | 34          | 29,054   | 17,687                          | 4,903    | 26                      | -              | 795             | 320            |                     |  |  |
| Red pine                                    | 111,035               | 107,084               | 87,748   | 190         | 8,464    | 2,313                           | 5,764    | 523                     | 2,082          | 2,368           | 1,583          |                     |  |  |
| White pine                                  | 28,795                | 21,571                | 17,347   | 637         | 2,279    | 176                             | 263      | 23                      | 846            | 493             | 6,731          |                     |  |  |
| White spruce                                | 11,066                | 9,453                 | 945      | 68          | 8,319    | 84                              | 1        | 4                       | 32             | 787             | 826            |                     |  |  |
| Black spruce                                | 7,329                 | 6,413                 | 460      | 64          | 5,792    | 60                              | 1        | 5                       | 31             | 538             | 378            |                     |  |  |
| Balsam fir                                  | 20,196                | 17,892                | 1,105    | -           | 16,395   | 384                             | 8        | -                       | -              | 1,495           | 809            |                     |  |  |
| Hemlock                                     | 10,963                | 9,227                 | 2,777    | 138         | 6,249    | 5                               | 58       | -                       | -              | 211             | 1,525          |                     |  |  |
| Tamarack                                    | 1,799                 | 1,473                 | 21       | 11          | 1,430    | -                               | 11       | -                       | -              | 126             | 200            |                     |  |  |
| Northern white-cedar                        | 25,633                | 17,182                | 10,113   | -           | 1,197    | 48                              | 26       | 3,296                   | 2,502          | 2,325           | 6,126          |                     |  |  |
| Other softwoods                             | 1,291                 | 1,030                 | -        | -           | -        | 1,025                           | 3        | 2                       | -              | 1               | 260            |                     |  |  |
| Total softwoods                             | 284,229               | 256,332               | 133,819  | 1,142       | 79,179   | 21,782                          | 11,038   | 3,879                   | 5,493          | 9,139           | 18,758         |                     |  |  |
| Hardwoods                                   |                       |                       |          |             |          |                                 |          |                         |                |                 |                |                     |  |  |
| Select white oak                            | 22,256                | 19,964                | 16,712   | 1,069       | 1,180    | -                               | 1,003    | 0                       | -              | 1,284           | 1,008          |                     |  |  |
| Select red oak                              | 97,071                | 87,171                | 75,211   | 3,718       | 1,655    | 450                             | 5,949    | 188                     | -              | 5,636           | 4,264          |                     |  |  |
| Other red oak                               | 22,492                | 19,617                | 17,810   | 454         | 311      | 54                              | 988      | 0                       | -              | 1,295           | 1,580          |                     |  |  |
| Select hickory                              | 627                   | 588                   | 576      | 3           | -        | -                               | 9        | -                       | -              | 39              | -              |                     |  |  |
| Other hickory                               | 1,630                 | 492                   | 483      | 2           | -        | -                               | 7        | -                       | -              | 33              | 1,105          |                     |  |  |
| Basswood                                    | 31,937                | 28,512                | 24,840   | 1,060       | 2,445    | 110                             | 57       | -                       | -              | 2,652           | 773            |                     |  |  |
| Beech                                       | 21,039                | 18,406                | 10,713   | 2,691       | 4,654    | 79                              | 269      | -                       | -              | 1,241           | 1,392          |                     |  |  |
| Yellow birch                                | 14,282                | 12,175                | 7,865    | 1,115       | 3,050    | -                               | 145      | -                       | -              | 834             | 1,273          |                     |  |  |
| Hard maple                                  | 169,112               | 155,487               | 97,534   | 13,706      | 39,467   | 1,682                           | 3,086    | -                       | 12             | 10,729          | 2,896          |                     |  |  |
| Soft maple                                  | 94,327                | 81,310                | 51,180   | 1,697       | 20,744   | 3,408                           | 4,269    | -                       | 12             | 7,290           | 5,727          |                     |  |  |
| Elm                                         | 2,113                 | 1,857                 | 703      | 46          | 314      | -                               | 794      | -                       | -              | 103             | 153            |                     |  |  |
| Black ash                                   | 7,523                 | 6,601                 | 4,843    | 351         | 927      | 18                              | 462      | -                       | -              | 422             | 500            |                     |  |  |
| White & green ash                           | 17,892                | 16,382                | 12,705   | 901         | 2,047    | 22                              | 707      | -                       | -              | 1,067           | 443            |                     |  |  |
| Sycamore                                    | 888                   | 810                   | 808      | 2           | -        | -                               | -        | -                       | -              | 78              | -              |                     |  |  |
| Cottonwood                                  | 4,992                 | 3,270                 | 3,155    | 47          | 5        | -                               | 63       | -                       | -              | 305             | 1,417          |                     |  |  |
| Willow                                      | 126                   | 2                     | -        | -           | -        | -                               | 2        | -                       | -              | -               | 124            |                     |  |  |
| Hackberry                                   | 2,088                 | 1,906                 | 1,906    | -           | -        | -                               | -        | -                       | -              | 182             | -              |                     |  |  |
| Balsam poplar                               | 10,090                | 8,538                 | 939      | 16          | 3,422    | 4,161                           | -        | -                       | -              | 885             | 667            |                     |  |  |
| Bigtooth aspen                              | 116,246               | 111,692               | 57,580   | 834         | 25,220   | 24,781                          | 3,024    | -                       | 253            | 3,285           | 1,269          |                     |  |  |
| Quaking aspen                               | 133,445               | 127,483               | 42,097   | 5,005       | 39,633   | 37,714                          | 1,585    | -                       | 1,449          | 4,042           | 1,920          |                     |  |  |
| Paper birch                                 | 29,725                | 25,807                | 8,732    | 1,416       | 14,548   | 845                             | 266      | -                       | -              | 2,455           | 1,463          |                     |  |  |
| Black cherry                                | 10,452                | 9,374                 | 5,827    | 544         | 2,651    | -                               | 352      | -                       | -              | 859             | 219            |                     |  |  |
| Black walnut                                | 2,667                 | 2,502                 | 2,179    | 306         | -        | -                               | 17       | -                       | -              | 165             | -              |                     |  |  |
| Butternut                                   | 211                   | 193                   | 193      | -           | -        | -                               | -        | -                       | -              | 18              | -              |                     |  |  |
| Yellow-poplar                               | 1,963                 | 1,793                 | 1,767    | 26          | -        | -                               | -        | -                       | -              | 170             | -              |                     |  |  |
| Sassafras                                   | 304                   | 12                    | 12       | -           | -        | -                               | -        | -                       | -              | 1               | 291            |                     |  |  |
| Other hardwoods                             | 878                   | 836                   | 429      | 12          | 10       | -                               | 310      | 75                      | -              | 42              | -              |                     |  |  |
| Total hardwoods                             | 816,376               | 742,780               | 446,799  | 35,021      | 162,283  | 73,324                          | 23,364   | 263                     | 1,726          | 45,112          | 28,484         |                     |  |  |
| All species                                 | 1,100,605             | 999,112               | 580,618  | 36,163      | 241,462  | 95,106                          | 34,402   | 4,142                   | 7,219          | 54,251          | 47,242         |                     |  |  |

<sup>1</sup> Includes chip board, oriented strand board, particleboard, engineered lumber, etc.<sup>2</sup> International 1/4-inch rule

Table 70. -- Total volume of wood fiber used for each primary product by softwoods and hardwoods, and source of material, Michigan, 1992

| Product by<br>softwoods and<br>hardwoods |                         | Standard<br>units | Roundwood products |                                     |                    |                        |                    |                        | Plant byproducts <sup>1</sup> |        |
|------------------------------------------|-------------------------|-------------------|--------------------|-------------------------------------|--------------------|------------------------|--------------------|------------------------|-------------------------------|--------|
|                                          |                         |                   | Total              |                                     | Growing stock      |                        | Nongrowing stock   |                        |                               |        |
|                                          |                         |                   | Number<br>of units | Thousand<br>cubic feet <sup>2</sup> | Number<br>of units | Thousand<br>cubic feet | Number<br>of units | Thousand<br>cubic feet |                               |        |
| Saw logs                                 |                         |                   |                    |                                     |                    |                        |                    |                        |                               |        |
| Softwoods                                | Thousand                |                   | 140,266            | 24,100                              | 135,928            | 23,343                 | 4,338              | 757                    | -                             | -      |
| Hardwoods                                | board feet <sup>3</sup> |                   | 492,112            | 84,766                              | 475,183            | 81,851                 | 16,929             | 2,915                  | -                             | -      |
| Total                                    |                         |                   | 632,378            | 108,866                             | 611,111            | 105,194                | 21,267             | 3,672                  | -                             | -      |
| Veneer logs                              |                         |                   |                    |                                     |                    |                        |                    |                        |                               |        |
| Softwoods                                | Thousand                |                   | 1,206              | 197                                 | 1,086              | 177                    | 120                | 20                     | -                             | -      |
| Hardwoods                                | board feet <sup>3</sup> |                   | 36,989             | 6,022                               | 33,308             | 5,423                  | 3,681              | 599                    | -                             | -      |
| Total                                    |                         |                   | 38,195             | 6,219                               | 34,394             | 5,600                  | 3,801              | 619                    | -                             | -      |
| Pulpwood <sup>4</sup>                    |                         |                   |                    |                                     |                    |                        |                    |                        |                               |        |
| Softwoods                                | Standard                |                   | 454,250            | 35,885                              | 405,127            | 32,005                 | 44,132             | 3,486                  | 4,991                         | 394    |
| Hardwoods                                | cords                   |                   | 1,602,648          | 126,609                             | 1,162,498          | 91,837                 | 282,107            | 22,286                 | 158,043                       | 12,486 |
| Total                                    |                         |                   | 2,056,898          | 162,494                             | 1,567,625          | 123,842                | 326,239            | 25,772                 | 163,034                       | 12,880 |
| Composite products <sup>5</sup>          |                         |                   |                    |                                     |                    |                        |                    |                        |                               |        |
| Softwoods                                | Standard                |                   | 168,276            | 13,294                              | 91,541             | 7,232                  | 25,525             | 2,016                  | 51,210                        | 4,046  |
| Hardwoods                                | cords                   |                   | 678,761            | 53,623                              | 574,101            | 45,354                 | 64,007             | 5,057                  | 40,653                        | 3,212  |
| Total                                    |                         |                   | 847,037            | 66,917                              | 665,642            | 52,586                 | 89,532             | 7,073                  | 91,863                        | 7,258  |
| Fuelwood                                 |                         |                   |                    |                                     |                    |                        |                    |                        |                               |        |
| Softwoods                                | Standard                |                   | 300,612            | 21,030                              | 68,471             | 4,786                  | 75,912             | 5,308                  | 156,229                       | 10,936 |
| Hardwoods                                | cords                   |                   | 1,394,119          | 97,575                              | 147,220            | 10,298                 | 585,947            | 41,010                 | 660,952                       | 46,267 |
| Total                                    |                         |                   | 1,694,731          | 118,605                             | 215,691            | 15,084                 | 661,859            | 46,318                 | 817,181                       | 57,203 |
| Posts, poles and pilings                 |                         |                   |                    |                                     |                    |                        |                    |                        |                               |        |
| Softwoods                                | Thousand                |                   | 3,881              | 3,881                               | 3,462              | 3,462                  | 419                | 419                    | -                             | -      |
| Hardwoods                                | cubic feet              |                   | 54                 | 54                                  | 42                 | 42                     | 12                 | 12                     | -                             | -      |
| Total                                    |                         |                   | 3,935              | 3,935                               | 3,504              | 3,504                  | 431                | 431                    | -                             | -      |
| Miscellaneous                            |                         |                   |                    |                                     |                    |                        |                    |                        |                               |        |
| Softwoods                                | Thousand                |                   | 5,244              | 5,244                               | 1,007              | 1,007                  | 43                 | 43                     | 4,194                         | 4,194  |
| Hardwoods                                | cubic feet              |                   | 16,011             | 16,011                              | 330                | 330                    | -                  | -                      | 15,681                        | 15,681 |
| Total                                    |                         |                   | 21,255             | 21,255                              | 1,337              | 1,337                  | 43                 | 43                     | 19,875                        | 19,875 |
| All products                             |                         |                   |                    |                                     |                    |                        |                    |                        |                               |        |
| Softwoods                                | Thousand                |                   |                    |                                     |                    | 72,012                 |                    | 12,049                 |                               | 19,570 |
| Hardwoods                                | cubic feet              |                   |                    |                                     |                    | 235,135                |                    | 71,879                 |                               | 77,646 |
| Total                                    |                         |                   |                    |                                     |                    | 307,147                |                    | 83,928                 |                               | 97,216 |

<sup>1</sup> Includes coarse and fine wood residues.

<sup>2</sup> Column should not be added to avoid double counting volume.

<sup>3</sup> International 1/4-inch rule.

<sup>4</sup> Includes roundwood and plant byproducts for wood pulp.

<sup>5</sup> Includes roundwood and plant byproducts for composite products.

Table 71. -- Output of roundwood products by product, softwoods and hardwoods,  
and source of material, Michigan, 1992

(In thousand cubic feet)

| Product by<br>softwoods and<br>hardwoods | All<br>sources | Growing stock |           |            | Rough and<br>rotten trees | Salvable<br>dead trees | Other<br>sources |
|------------------------------------------|----------------|---------------|-----------|------------|---------------------------|------------------------|------------------|
|                                          |                | Total         | Sawtimber | Poletimber |                           |                        |                  |
| Saw logs                                 |                |               |           |            |                           |                        |                  |
| Softwoods                                | 24,100         | 23,343        | 22,956    | 387        | 17                        | 283                    | 457              |
| Hardwoods                                | 84,766         | 81,851        | 76,799    | 5,052      | 893                       | 370                    | 1,652            |
| Total                                    | 108,866        | 105,194       | 99,755    | 5,439      | 910                       | 653                    | 2,109            |
| Veneer logs                              |                |               |           |            |                           |                        |                  |
| Softwoods                                | 196            | 177           | 177       | -          | 19                        | -                      | -                |
| Hardwoods                                | 6,023          | 5,423         | 5,423     | -          | 589                       | -                      | 11               |
| Total                                    | 6,219          | 5,600         | 5,600     | -          | 608                       | -                      | 11               |
| Pulpwood                                 |                |               |           |            |                           |                        |                  |
| Softwoods                                | 35,491         | 32,005        | 20,655    | 11,350     | 573                       | 864                    | 2,049            |
| Hardwoods                                | 114,124        | 91,837        | 41,276    | 50,561     | 12,508                    | 1,060                  | 8,719            |
| Total                                    | 149,615        | 123,842       | 61,931    | 61,911     | 13,081                    | 1,924                  | 10,768           |
| Composite products <sup>1</sup>          |                |               |           |            |                           |                        |                  |
| Softwoods                                | 9,248          | 7,232         | 5,640     | 1,592      | 75                        | 320                    | 1,621            |
| Hardwoods                                | 50,411         | 45,354        | 18,312    | 27,042     | 1,960                     | 462                    | 2,635            |
| Total                                    | 59,659         | 52,586        | 23,952    | 28,634     | 2,035                     | 782                    | 4,256            |
| Fuelwood                                 |                |               |           |            |                           |                        |                  |
| Softwoods                                | 10,095         | 4,786         | 2,168     | 2,618      | 475                       | 277                    | 4,557            |
| Hardwoods                                | 51,307         | 10,298        | 4,812     | 5,486      | 962                       | 15,327                 | 24,720           |
| Total                                    | 61,402         | 15,084        | 6,980     | 8,104      | 1,437                     | 15,604                 | 29,277           |
| Posts, poles and pilings                 |                |               |           |            |                           |                        |                  |
| Softwoods                                | 3,881          | 3,462         | 1,037     | 2,425      | 46                        | 63                     | 310              |
| Hardwoods                                | 54             | 42            | 42        | -          | -                         | 12                     | -                |
| Total                                    | 3,935          | 3,504         | 1,079     | 2,425      | 46                        | 75                     | 310              |
| Miscellaneous products                   |                |               |           |            |                           |                        |                  |
| Softwoods                                | 1,051          | 1,008         | 976       | 32         | 2                         | 19                     | 22               |
| Hardwoods                                | 330            | 330           | 241       | 89         | -                         | -                      | -                |
| Total                                    | 1,381          | 1,338         | 1,217     | 121        | 2                         | 19                     | 22               |
| All products                             |                |               |           |            |                           |                        |                  |
| Softwoods                                | 84,062         | 72,012        | 53,607    | 18,405     | 1,206                     | 1,826                  | 9,018            |
| Hardwoods                                | 307,015        | 235,135       | 146,905   | 88,230     | 16,912                    | 17,231                 | 37,737           |
| Total                                    | 391,077        | 307,147       | 200,512   | 106,635    | 18,118                    | 19,057                 | 46,755           |

<sup>1</sup> Includes chip board, oriented strand board, particleboard, engineered lumber, etc.

Table 72. -- Timber products from roundwood by species group and product, Michigan, 1992

| Species group         | All products        |                                  | Saw logs            |                                  | Veneer logs         |                                  | Pulpwood |                     | Composite products <sup>1</sup> |                     | Fuelwood |                     | Posts, poles, and pilings |     | Misc. products |
|-----------------------|---------------------|----------------------------------|---------------------|----------------------------------|---------------------|----------------------------------|----------|---------------------|---------------------------------|---------------------|----------|---------------------|---------------------------|-----|----------------|
|                       | Thousand cubic feet | Thousand board feet <sup>2</sup> | Thousand cubic feet | Thousand board feet <sup>2</sup> | Thousand cubic feet | Thousand board feet <sup>2</sup> | Cords    | Thousand cubic feet | Cords                           | Thousand cubic feet | Cords    | Thousand cubic feet | Thousand cubic feet       |     |                |
| Softwoods             |                     |                                  |                     |                                  |                     |                                  |          |                     |                                 |                     |          |                     |                           |     |                |
| Jack pine             | 28,886              | 14,381                           | 2,708               | 36                               | 6                   | 186,000                          | 14,693   | 94,863              | 7,494                           | 56,566              | 3,955    | 30                  | -                         | -   | -              |
| Red pine              | 26,168              | 91,283                           | 15,308              | 200                              | 33                  | 49,790                           | 3,933    | 13,432              | 1,061                           | 75,085              | 5,250    | 218                 | 365                       | 151 | 7              |
| White pine            | 5,070               | 18,045                           | 3,027               | 674                              | 109                 | 13,405                           | 1,059    | 869                 | 69                              | 9,001               | 630      | 25                  | 1                         | 6   | 7              |
| White spruce          | 3,484               | 1,021                            | 192                 | 71                               | 11                  | 41,007                           | 3,240    | 413                 | 33                              | 6                   | -        | 2                   | -                         | -   | -              |
| Black spruce          | 2,392               | 499                              | 94                  | 67                               | 11                  | 28,548                           | 2,256    | 293                 | 23                              | 7                   | -        | -                   | -                         | -   | -              |
| Balsam fir            | 6,767               | 1,195                            | 225                 | -                                | -                   | 80,803                           | 6,384    | 1,890               | 149                             | 133                 | 9        | -                   | -                         | -   | -              |
| Hemlock               | 3,460               | 2,888                            | 484                 | 146                              | 24                  | 36,761                           | 2,904    | 22                  | 2                               | 664                 | 46       | -                   | -                         | -   | -              |
| Tamarack              | 572                 | 22                               | 4                   | 12                               | 2                   | 7,046                            | 557      | -                   | -                               | 128                 | 9        | -                   | -                         | -   | -              |
| Northern white-cedar  | 6,751               | 10,932                           | 2,058               | -                                | -                   | 5,899                            | 465      | 238                 | 18                              | 1,208               | 85       | 3,603               | 522                       | -   | -              |
| Other softwoods       | 512                 | -                                | -                   | -                                | -                   | -                                | -        | 5,046               | 399                             | 1,587               | 111      | 2                   | -                         | -   | -              |
| Total softwoods       | 84,062              | 140,266                          | 24,100              | 1,206                            | 196                 | 449,259                          | 35,491   | 117,066             | 9,248                           | 144,385             | 10,095   | 3,881               | 1,051                     | -   | -              |
| Hardwoods             |                     |                                  |                     |                                  |                     |                                  |          |                     |                                 |                     |          |                     |                           |     |                |
| Select white oak      | 10,108              | 18,831                           | 3,305               | 1,129                            | 184                 | 25,733                           | 2,033    | -                   | -                               | 65,522              | 4,586    | -                   | -                         | -   | -              |
| Select red oak        | 31,394              | 84,755                           | 14,874              | 3,927                            | 639                 | 41,659                           | 3,291    | 8,103               | 640                             | 170,343             | 11,920   | 30                  | -                         | -   | -              |
| Other red oak         | 7,475               | 20,070                           | 3,522               | 479                              | 78                  | 6,556                            | 518      | 982                 | 78                              | 46,846              | 3,279    | -                   | -                         | -   | -              |
| Select hickory        | 276                 | 607                              | 102                 | 3                                | 1                   | -                                | -        | -                   | -                               | 2,478               | 173      | -                   | -                         | -   | -              |
| Other hickory         | 231                 | 508                              | 86                  | 3                                | -                   | -                                | -        | -                   | -                               | 2,073               | 145      | -                   | -                         | -   | -              |
| Basswood              | 7,184               | 26,172                           | 4,595               | 1,120                            | 182                 | 27,100                           | 2,141    | 1,986               | 157                             | 1,551               | 109      | -                   | -                         | -   | -              |
| Beech                 | 6,374               | 11,291                           | 1,901               | 2,842                            | 463                 | 35,455                           | 2,801    | 1,424               | 112                             | 15,667              | 1,097    | -                   | -                         | -   | -              |
| Yellow birch          | 3,689               | 8,289                            | 1,395               | 1,177                            | 192                 | 24,134                           | 1,907    | -                   | -                               | 2,781               | 195      | -                   | -                         | -   | -              |
| Hard maple            | 49,917              | 102,494                          | 16,625              | 14,475                           | 2,358               | 309,519                          | 24,451   | 17,881              | 1,413                           | 72,431              | 5,068    | -                   | -                         | -   | -              |
| Soft maple            | 38,339              | 53,925                           | 9,469               | 1,792                            | 292                 | 212,729                          | 16,805   | 45,871              | 3,624                           | 116,422             | 8,147    | 2                   | 2                         | -   | -              |
| Elm                   | 3,892               | 740                              | 130                 | 49                               | 8                   | 3,095                            | 245      | -                   | -                               | 50,135              | 3,509    | -                   | -                         | -   | -              |
| Black ash             | 2,141               | 5,106                            | 860                 | 370                              | 60                  | 7,511                            | 593      | 317                 | 25                              | 8,614               | 603      | -                   | -                         | -   | -              |
| White & green ash     | 5,243               | 13,392                           | 2,256               | 952                              | 155                 | 17,722                           | 1,400    | 394                 | 31                              | 20,022              | 1,401    | -                   | -                         | -   | -              |
| Sycamore              | 150                 | 852                              | 150                 | 2                                | -                   | -                                | -        | -                   | -                               | -                   | -        | -                   | -                         | -   | -              |
| Cottonwood            | 807                 | 3,324                            | 584                 | 50                               | 8                   | 63                               | 5        | -                   | -                               | 3,008               | 210      | -                   | -                         | -   | -              |
| Willow                | 38                  | -                                | -                   | -                                | -                   | -                                | -        | -                   | -                               | 539                 | 38       | -                   | -                         | -   | -              |
| Hackberry             | 353                 | 2,008                            | 353                 | -                                | -                   | -                                | -        | -                   | -                               | -                   | -        | -                   | -                         | -   | -              |
| Balsam poplar         | 6,167               | 990                              | 174                 | 17                               | 3                   | 34,725                           | 2,743    | 41,098              | 3,247                           | -                   | -        | -                   | -                         | -   | -              |
| Bigtooth aspen        | 47,621              | 68,507                           | 12,050              | 881                              | 143                 | 204,631                          | 16,167   | 201,608             | 15,927                          | 46,983              | 3,286    | -                   | 48                        | -   | -              |
| Quaking aspen         | 61,453              | 50,085                           | 8,810               | 5,287                            | 861                 | 321,933                          | 25,432   | 304,933             | 24,090                          | 28,332              | 1,982    | -                   | 278                       | -   | -              |
| Paper birch           | 14,945              | 9,199                            | 1,615               | 1,496                            | 244                 | 145,153                          | 11,468   | 13,511              | 1,067                           | 7,878               | 551      | -                   | -                         | -   | -              |
| Black cherry          | 4,766               | 6,141                            | 1,079               | 574                              | 93                  | 26,733                           | 2,112    | -                   | -                               | 21,173              | 1,482    | -                   | -                         | -   | -              |
| Black walnut          | 767                 | 2,297                            | 387                 | 324                              | 53                  | -                                | -        | -                   | -                               | 4,679               | 327      | -                   | -                         | -   | -              |
| Butternut             | 36                  | 203                              | 36                  | -                                | -                   | -                                | -        | -                   | -                               | -                   | -        | -                   | -                         | -   | -              |
| Yellow-poplar         | 331                 | 1,862                            | 327                 | 27                               | 4                   | -                                | -        | -                   | -                               | -                   | -        | -                   | -                         | -   | -              |
| Sassafras             | 21                  | 12                               | 2                   | -                                | -                   | -                                | -        | -                   | -                               | 272                 | 19       | -                   | -                         | -   | -              |
| Other hardwoods       | 2,405               | 452                              | 79                  | 13                               | 2                   | 155                              | 12       | -                   | -                               | 32,679              | 2,288    | 24                  | -                         | -   | -              |
| Noncommercial species | 892                 | -                                | -                   | -                                | -                   | -                                | -        | -                   | -                               | -                   | -        | -                   | -                         | -   | -              |
| Total hardwoods       | 307,015             | 492,112                          | 84,766              | 36,989                           | 6,023               | 1,444,606                        | 114,124  | 638,108             | 50,411                          | 733,167             | 51,307   | 54                  | 330                       | -   | -              |
| All species           | 391,077             | 632,378                          | 108,866             | 38,195                           | 6,219               | 1,893,865                        | 149,615  | 755,174             | 59,659                          | 877,552             | 61,402   | 3,935               | 1,381                     | -   | -              |

Includes chip board, oriented strand board, particleboard, engineered lumber, etc.  
International 1/4-inch rule.

<sup>1</sup> Includes chip board, oriented strand board, particleboard, engineered lumber, etc.<sup>2</sup> International 1/4-inch rule.

Table 73. -- Volume of primary plant residue by use and type of wood residue, and softwoods and hardwoods, Michigan, 1992  
(In thousand cubic feet)

| Use                         | Wood residue |           |                     |           |           |           |                   |           |
|-----------------------------|--------------|-----------|---------------------|-----------|-----------|-----------|-------------------|-----------|
|                             | Total        |           | Coarse <sup>1</sup> |           |           |           | Fine <sup>2</sup> |           |
|                             | Softwoods    | Hardwoods | Softwoods           | Hardwoods | Softwoods | Hardwoods | Softwoods         | Hardwoods |
|                             |              |           |                     |           |           |           |                   |           |
| Fiber products <sup>3</sup> | 4,440        | 15,234    | 4,092               | 15,053    |           | 348       | 181               | 463       |
| Fuel                        | 4,514        | 12,412    | 1,568               | 6,676     |           | 2,946     | 5,736             | 33,854    |
| Miscellaneous <sup>4</sup>  | 1,468        | 7,368     | 686                 | 1,039     |           | 782       | 6,329             | 8,313     |
| Not used <sup>5</sup>       | 302          | 1,000     | 234                 | 448       |           | 68        | 552               | 336       |
| Total                       | 10,724       | 36,014    | 6,580               | 23,216    |           | 4,144     | 12,798            | 42,966    |

<sup>1</sup> Suitable for chipping such as slabs, edgings, veneer cores, etc.

<sup>2</sup> Not suitable for chipping such as sawdust, veneer clippings, etc.

<sup>3</sup> For manufacture of pulp, hardboard, roofing felt, particleboard, etc.

<sup>4</sup> Livestock bedding, mulch, small dimension and specialty items.

<sup>5</sup> Includes residue burned as waste.

Table 74. -- All live tree biomass yields on timberland by species group and forest type, Michigan, 1993

(in pounds per acre green weight)

| Species group         | Mean for all types | Forest type |          |            |            |              |              |                      |          |             |                    |                   |         |         |         | Balsam poplar | Paper birch | Non-stocked |         |         |         |         |         |         |        |       |
|-----------------------|--------------------|-------------|----------|------------|------------|--------------|--------------|----------------------|----------|-------------|--------------------|-------------------|---------|---------|---------|---------------|-------------|-------------|---------|---------|---------|---------|---------|---------|--------|-------|
|                       |                    | Jack pine   | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-beech-birch | Aspen   |         |         |               |             |             |         |         |         |         |         |         |        |       |
| Softwoods             |                    |             |          |            |            |              |              |                      |          |             |                    |                   |         |         |         |               |             |             |         |         |         |         |         |         |        |       |
| Jack pine             | 2,830              | 45,979      | 5,251    | 2,423      | 352        | 1,062        | 2,606        | 16                   | 154      | 2,141       | 46                 | 538               | 1,774   | 532     | 130     | 2,141         | 46          | 154         | 16      | 2,606   | 1,062   | 352     | 2,423   | 5,251   | 45,979 | 1,545 |
| Red pine              | 6,257              | 7,183       | 102,891  | 10,105     | 1,208      | 1,407        | 1,257        | 246                  | 85       | 1,952       | 255                | 1,774             | 3,379   | 1,720   | 622     | 1,952         | 255         | 85          | 246     | 1,257   | 1,208   | 1,407   | 10,105  | 102,891 | 7,183  | 749   |
| White pine            | 3,514              | 2,173       | 6,647    | 73,526     | 4,507      | 4,380        | 3,787        | 3,022                | 1,429    | 2,747       | 1,097              | 3,379             | 3,164   | 1,901   | 2,489   | 2,747         | 1,097       | 1,429       | 3,022   | 4,380   | 4,507   | 73,526  | 6,647   | 2,173   | 11     |       |
| White spruce          | 2,129              | 411         | 948      | 4,272      | 10,949     | 46,991       | 1,578        | 2,838                | 362      | 169         | 1,026              | 3,164             | 2,868   | 2,432   | 1,365   | 169           | 1,026       | 362         | 2,838   | 46,991  | 10,949  | 46,991  | 4,272   | 948     | 91     |       |
| Black spruce          | 2,254              | 1,212       | 357      | 3,127      | 6,083      | 2,578        | 46,229       | 6,171                | 8,231    | 19          | 635                | 1,173             | 783     | 634     | 246     | 19            | 635         | 8,231       | 6,171   | 2,578   | 6,083   | 3,127   | 357     | 1,212   | -      |       |
| Balsam fir            | 5,771              | 370         | 1,278    | 5,687      | 41,182     | 10,291       | 7,286        | 14,063               | 4,769    | 133         | 4,574              | 14,552            | 12,794  | 6,425   | 3,533   | 133           | 4,574       | 4,769       | 14,063  | 10,291  | 41,182  | 5,687   | 1,278   | 370     | 46     |       |
| Hemlock               | 3,639              | -           | 206      | 1,354      | 1,296      | 125          | 440          | 1,901                | -        | 132         | 1,473              | 818               | 519     | 482     | 75      | 132           | 1,473       | -           | 1,901   | 125     | 1,296   | 1,354   | 206     | -       | -      |       |
| Tamarack              | 1,020              | 42          | 81       | 190        | 1,686      | 601          | 6,828        | 3,921                | 45,266   | -           | 3                  | 877               | 1,432   | 234     | 19      | 78            | 3           | -           | 3,921   | 601     | 1,686   | 190     | 42      | -       | -      |       |
| Eastern redcedar      | 16                 | -           | -        | 61         | -          | -            | -            | -                    | -        | 62          | 6,068              | 10,827            | 9,563   | 2,320   | 2,248   | 62            | 6,068       | -           | -       | -       | -       | -       | -       | -       | -      | -     |
| Northern white-cedar  | 9,396              | 36          | 238      | 1,333      | 10,165     | 5,823        | 4,871        | 93,809               | 11,065   | 205         | 81                 | 39                | -       | 37      | 225     | 205           | 81          | -           | 93,809  | 5,823   | 10,165  | 10,165  | 238     | 36      | -      |       |
| Other softwoods       | 668                | 10,585      | 1,047    | 246        | 118        | 762          | 24           | 28                   | -        | 7,649       | 15,803             | 38,146            | 28,450  | 16,717  | 19,137  | 7,649         | 15,803      | -           | 28      | 762     | 118     | 246     | 1,047   | 10,585  | -      |       |
| Total softwoods       | 37,494             | 67,991      | 118,944  | 102,324    | 77,546     | 74,020       | 74,906       | 126,015              | 71,361   | 7,649       | 15,803             | 38,146            | 28,450  | 16,717  | 19,137  | 7,649         | 15,803      | 71,361      | 126,015 | 74,020  | 77,546  | 102,324 | 118,944 | 67,991  | 2,442  |       |
| Hardwoods             |                    |             |          |            |            |              |              |                      |          |             |                    |                   |         |         |         |               |             |             |         |         |         |         |         |         |        |       |
| Select white oak      | 5,176              | 654         | 2,128    | 4,411      | -          | -            | -            | 8                    | 25       | 35,841      | 3,003              | 655               | -       | 882     | 2,007   | 35,841        | 3,003       | 25          | 8       | -       | -       | -       | -       | 2,128   | 654    | -     |
| Other white oak       | 6                  | -           | -        | -          | -          | -            | -            | -                    | -        | 22          | 46                 | -                 | -       | 1       | -       | 22            | 46          | -           | -       | -       | -       | -       | -       | -       | -      | -     |
| Select red oak        | 10,223             | 4,241       | 4,901    | 6,732      | 356        | 930          | 2            | 37                   | 167      | 61,836      | 1,641              | 3,196             | 303     | 5,783   | 5,400   | 61,836        | 1,641       | 167         | 37      | 930     | 356     | 6,732   | 4,901   | 4,241   | -      |       |
| Other red oak         | 2,691              | 2,120       | 2,873    | 2,563      | -          | -            | -            | -                    | -        | 19,109      | 605                | -                 | -       | 551     | 660     | 19,109        | 605         | -           | -       | -       | -       | -       | -       | 2,873   | 2,120  | -     |
| Select hickory        | 573                | 36          | -        | -          | -          | -            | -            | -                    | -        | 3,002       | 218                | -                 | -       | 8       | 602     | 3,002         | 218         | -           | -       | -       | -       | -       | -       | -       | -      | -     |
| Other hickory         | 384                | 167         | 28       | -          | -          | -            | -            | -                    | -        | 1,750       | 99                 | -                 | -       | -       | 468     | 1,750         | 99          | -           | -       | -       | -       | -       | -       | -       | -      | -     |
| Basswood              | 3,914              | 213         | 132      | 67         | 241        | 53           | -            | 164                  | -        | 989         | 1,880              | 722               | 91      | 881     | 9,019   | 989           | 1,880       | -           | 164     | -       | -       | -       | 132     | 213     | -      |       |
| Beech                 | 3,353              | 4           | 254      | 391        | 82         | -            | -            | 10                   | -        | 687         | 315                | 303               | -       | 380     | 8,247   | 687           | 315         | -           | 10      | -       | -       | -       | 254     | 4       | -      |       |
| Yellow birch          | 4,293              | 19          | 16       | 516        | 2,579      | 708          | 184          | 2,803                | 132      | 71          | 3,319              | 1,318             | 485     | 494     | -       | 71            | 3,319       | -           | 2,803   | 708     | 2,579   | 708     | 16      | 19      | -      |       |
| Hard maple            | 28,253             | 727         | 1,592    | 3,324      | 3,228      | 2,583        | 118          | 1,059                | 13       | 1,850       | 2,450              | 7,951             | 813     | 4,274   | 69,525  | 1,850         | 2,450       | 13          | 1,059   | 3,228   | 3,228   | 1,592   | 727     | 727     | -      |       |
| Soft maple            | 22,169             | 1,604       | 4,850    | 9,794      | 9,578      | 8,003        | 2,391        | 6,971                | 1,807    | 14,910      | 52,719             | 19,862            | 2,137   | 13,552  | 32,056  | 14,910        | 52,719      | 1,807       | 6,971   | 9,578   | 9,794   | 4,850   | 1,604   | -       | 406    |       |
| Elm                   | 2,208              | 68          | 65       | 109        | 135        | 342          | 103          | 212                  | 389      | 1,061       | 7,746              | 466               | 1,178   | 548     | 3,340   | 1,061         | 7,746       | 389         | 212     | 342     | 135     | 109     | 65      | 68      | -      |       |
| Black ash             | 2,587              | -           | -        | 328        | 1,980      | 669          | 63           | 4,843                | 730      | 178         | 15,701             | 1,912             | 4,204   | 937     | 1,458   | 178           | 15,701      | 730         | 4,843   | 669     | 1,980   | 328     | -       | -       | -      |       |
| White & green ash     | 4,594              | 116         | 374      | 177        | 90         | 101          | 67           | 586                  | 239      | 2,428       | 13,836             | 618               | -       | 1,250   | 7,380   | 2,428         | 13,836      | 239         | 586     | 90      | 101     | 177     | 374     | 116     | -      |       |
| Sycamore              | 114                | -           | -        | -          | -          | -            | -            | -                    | -        | 48          | 886                | -                 | -       | -       | 81      | 48            | 886         | -           | -       | -       | -       | -       | -       | -       | -      | -     |
| Cottonwood            | 638                | 18          | -        | -          | -          | -            | -            | 29                   | -        | 313         | 4,385              | 72                | -       | 136     | 508     | 313           | 4,385       | -           | 29      | -       | -       | -       | -       | -       | -      | -     |
| Willow                | 320                | -           | 97       | -          | 6          | 69           | 13           | 19                   | -        | 90          | 2,471              | 65                | -       | 33      | 210     | 90            | 2,471       | -           | 19      | -       | 6       | -       | 97      | -       | -      | -     |
| Hackberry             | 28                 | -           | -        | -          | -          | -            | -            | -                    | -        | 44          | 113                | -                 | -       | -       | 34      | 44            | 113         | -           | -       | -       | -       | -       | -       | -       | -      | -     |
| Balsam poplar         | 1,968              | 366         | 138      | 965        | 3,119      | 2,500        | 520          | 3,889                | 839      | 59          | 2,040              | 5,847             | 59,812  | 3,063   | 495     | 59            | 2,040       | 839         | 3,889   | 2,500   | 3,119   | 965     | 138     | 366     | -      |       |
| Bigtooth aspen        | 6,416              | 649         | 2,568    | 3,635      | 887        | 292          | 322          | 287                  | 92       | 8,214       | 1,123              | 554               | -       | 25,996  | 3,557   | 8,214         | 1,123       | 92          | 287     | 887     | 887     | 3,635   | 2,568   | 649     | -      |       |
| Quaking aspen         | 11,875             | 2,378       | 3,529    | 8,092      | 13,855     | 15,894       | 5,154        | 4,515                | 1,272    | 2,131       | 6,137              | 15,466            | 11,656  | 46,655  | 6,896   | 2,131         | 6,137       | 1,272       | 4,515   | 15,894  | 13,855  | 8,092   | 3,529   | 2,378   | 529    |       |
| Paper birch           | 5,295              | 333         | 1,181    | 6,195      | 10,531     | 10,455       | 3,726        | 8,965                | 2,459    | 1,176       | 3,646              | 6,477             | -       | 6,970   | 3,420   | 1,176         | 3,646       | 2,459       | 8,965   | 10,455  | 10,531  | 6,195   | 1,181   | 333     | -      |       |
| Tupelo                | 55                 | -           | -        | -          | -          | -            | -            | -                    | -        | 136         | 233                | 144               | -       | 35      | 32      | 136           | 233         | -           | -       | -       | -       | -       | -       | -       | -      | -     |
| Black cherry          | 3,293              | 1,429       | 1,884    | 678        | 1,341      | 1,934        | 355          | 201                  | 345      | 3,943       | 1,653              | 295               | -       | 1,531   | 5,855   | 3,943         | 1,653       | 345         | 201     | 1,934   | 1,341   | 678     | 1,884   | 1,429   | 14     |       |
| Black walnut          | 308                | 21          | 16       | -          | -          | -            | -            | 4                    | -        | 1,558       | 72                 | -                 | -       | -       | 346     | 1,558         | 72          | -           | 4       | -       | -       | -       | -       | -       | -      | -     |
| Butternut             | 56                 | 55          | -        | -          | -          | -            | -            | 27                   | -        | 124         | 117                | -                 | -       | -       | 73      | 124           | 117         | -           | 27      | -       | -       | -       | -       | -       | -      | -     |
| Yellow poplar         | 188                | 40          | 8        | -          | -          | -            | -            | -                    | -        | 173         | 365                | -                 | -       | -       | 353     | 173           | 365         | -           | -       | -       | -       | -       | -       | -       | -      | -     |
| Sassafras             | 422                | 335         | 120      | 4          | -          | -            | -            | -                    | -        | 1,410       | 94                 | -                 | -       | 35      | 32      | 1,410         | 94          | -           | -       | -       | -       | -       | -       | -       | -      | -     |
| Other hardwoods       | 315                | 40          | 65       | -          | 18         | 45           | -            | 12                   | 2        | 401         | 1,115              | 374               | -       | 40      | 413     | 401           | 1,115       | 2           | 12      | 45      | 18      | -       | 65      | 40      | -      |       |
| Total hardwoods       | 121,715            | 15,633      | 26,619   | 47,981     | 48,026     | 44,578       | 13,018       | 34,641               | 8,511    | 163,554     | 128,028            | 138,804           | 89,476  | 114,035 | 172,406 | 163,554       | 128,028     | 8,511       | 34,641  | 48,026  | 44,578  | 47,981  | 26,619  | 15,633  | -      |       |
| Noncommercial species | 1,401              | 135         | 128      | 549        | 316        | 294          | 131          | 165                  | 60       | 973         | 1,476              | 490               | 462     | 644     | 2,642   | 973           | 1,476       | 60          | 165     | 316     | 294     | 549     | 128     | 135     | -      | 34    |
| All species           | 160,610            | 83,759      | 145,991  | 150,854    | 125,888    | 118,892      | 88,055       | 160,821              | 79,932   | 172,176     | 145,307            | 177,440           | 118,388 | 131,386 | 194,185 | 172,176       | 145,307     | 79,932      | 160,821 | 125,888 | 118,892 | 150,854 | 145,991 | 83,759  | -      | 3,425 |

Table 75. -- All live tree biomass on timberland by species group and forest type, Michigan, 1993  
(in green tons)

| Species group         | Forest type   |            |            |            |            |              |              |                      |           |             |                    |                   |             |             |               | Non-stocked |
|-----------------------|---------------|------------|------------|------------|------------|--------------|--------------|----------------------|-----------|-------------|--------------------|-------------------|-------------|-------------|---------------|-------------|
|                       | All types     | Jack pine  | Red pine   | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar | Tamarack  | Oak-hickory | Elm-ash-soft maple | Maple-beech-birch | Aspen       | Paper birch | Balsam poplar |             |
| Softwoods             |               |            |            |            |            |              |              |                      |           |             |                    |                   |             |             |               |             |
| Jack pine             | 26,340,397    | 19,451,450 | 2,355,792  | 283,205    | 99,013     | 78,037       | 606,123      | 10,830               | 11,480    | 2,121,619   | 37,461             | 465,587           | 711,663     | 78,393      | -             | 29,744      |
| Red pine              | 58,241,937    | 3,038,849  | 46,156,881 | 1,181,331  | 340,246    | 103,354      | 292,243      | 166,038              | 6,316     | 1,934,567   | 207,776            | 2,223,229         | 2,300,825   | 258,570     | 14,286        | 14,426      |
| White pine            | 32,706,732    | 919,487    | 2,981,815  | 8,595,175  | 1,269,059  | 321,747      | 880,595      | 2,038,927            | 106,363   | 2,722,181   | 892,213            | 8,911,132         | 2,543,081   | 492,500     | 32,250        | 207         |
| Black spruce          | 19,818,359    | 173,735    | 425,095    | 499,371    | 3,082,710  | 3,451,491    | 367,028      | 1,914,822            | 26,967    | 167,373     | 834,261            | 4,887,107         | 3,253,513   | 461,126     | 272,001       | 1,759       |
| Balsam fir            | 20,975,927    | 512,890    | 159,954    | 365,595    | 1,712,754  | 189,362      | 10,750,500   | 4,163,350            | 612,781   | 18,717      | 516,596            | 880,290           | 847,930     | 170,959     | 74,249        | -           |
| Hemlock               | 53,715,863    | 156,551    | 573,284    | 664,824    | 11,594,833 | 755,879      | 1,694,440    | 9,488,618            | 355,050   | 131,772     | 3,720,875          | 12,649,174        | 8,595,224   | 2,120,969   | 1,213,480     | 890         |
| Tamarack              | 33,869,318    | -          | 92,358     | 158,227    | 384,848    | 9,204        | 102,319      | 1,282,776            | -         | 130,957     | 1,459,585          | 29,308,779        | 645,392     | 285,638     | 49,255        | -           |
| Eastern redcedar      | 9,497,484     | 17,686     | 36,553     | 22,212     | 474,736    | 44,117       | 1,587,931    | 2,645,716            | 3,370,051 | 11,113      | 443,507            | 267,766           | 312,400     | 127,885     | 135,811       | -           |
| Northern white-cedar  | 153,143       | -          | -          | 7,091      | -          | -            | -            | -                    | -         | 76,953      | 2,301              | 66,798            | -           | -           | -             | -           |
| Northern softwoods    | 87,454,045    | 15,311     | 106,665    | 155,840    | 2,862,006  | 427,725      | 1,132,729    | 63,292,727           | 823,790   | 61,645      | 4,935,839          | 8,050,827         | 3,103,875   | 1,578,012   | 907,054       | -           |
| Other softwoods       | 6,219,468     | 4,477,999  | 469,738    | 28,740     | 33,143     | 56,001       | 5,635        | 18,770               | -         | 203,591     | 65,563             | 805,310           | 49,266      | 5,712       | -             | -           |
| Total softwoods       | 348,992,673   | 28,763,958 | 53,358,135 | 11,961,611 | 21,833,348 | 5,436,917    | 17,419,543   | 85,022,574           | 5,312,798 | 7,580,488   | 13,115,957         | 68,518,999        | 22,363,169  | 5,559,764   | 2,696,386     | 47,026      |
| Hardwoods             |               |            |            |            |            |              |              |                      |           |             |                    |                   |             |             |               |             |
| Select white oak      | 48,173,960    | 276,578    | 954,589    | 515,704    | -          | -            | -            | 5,114                | 1,842     | 35,515,078  | 2,442,397          | 7,187,646         | 1,179,543   | 95,469      | -             | -           |
| Other white oak       | 60,365        | -          | -          | -          | -          | -            | -            | -                    | -         | 22,128      | 37,159             | -                 | 1,078       | -           | -             | -           |
| Select red oak        | 95,159,722    | 1,794,221  | 2,198,439  | 786,953    | -          | 68,325       | 363          | 24,685               | 12,407    | 61,272,856  | 1,335,145          | 19,335,396        | 7,736,297   | 465,816     | 28,698        | -           |
| Other red oak         | 25,043,609    | 896,722    | 1,288,632  | 299,611    | -          | -            | -            | -                    | -         | 18,935,373  | 492,270            | 2,361,468         | 737,091     | -           | 32,442        | -           |
| Select hickory        | 5,333,366     | 15,071     | -          | -          | -          | -            | -            | -                    | -         | 2,975,010   | 177,390            | 2,155,763         | 10,142      | -           | -             | -           |
| Other hickory         | 3,572,500     | 70,568     | 12,450     | -          | -          | -            | -            | -                    | -         | 1,734,440   | 80,441             | 1,674,601         | -           | -           | -             | -           |
| Basswood              | 36,434,255    | 90,145     | 59,035     | 7,875      | 67,718     | 3,928        | -            | 110,455              | -         | 979,676     | 1,529,424          | 32,293,387        | 1,178,812   | 105,193     | 8,607         | -           |
| Beech                 | 31,211,534    | 1,831      | 114,150    | 45,719     | 23,089     | -            | -            | 6,468                | -         | 681,053     | 255,994            | 29,530,136        | 508,984     | 44,110      | -             | -           |
| Yellow birch          | 39,957,689    | 7,958      | 7,340      | 60,338     | 726,180    | 51,994       | 42,681       | 1,890,973            | 9,837     | 70,669      | 2,700,082          | 33,490,230        | 661,351     | 192,056     | 46,000        | -           |
| Hard maple            | 262,976,543   | 307,386    | 714,375    | 388,582    | 908,815    | 189,730      | 27,450       | 714,566              | 950       | 1,832,760   | 1,992,574          | 248,945,030       | 5,718,318   | 1,158,871   | 77,136        | -           |
| Soft maple            | 206,351,790   | 678,410    | 2,175,906  | 1,144,862  | 2,696,605  | 587,805      | 556,081      | 4,703,089            | 134,512   | 14,774,175  | 42,884,096         | 114,780,188       | 18,130,669  | 2,894,859   | 202,726       | 7,807       |
| Elm                   | 20,555,213    | 28,797     | 29,274     | 12,736     | 37,936     | 25,086       | 23,874       | 142,867              | 28,950    | 1,051,240   | 6,300,720          | 11,960,648        | 733,497     | 67,889      | 111,699       | -           |
| Black ash             | 24,082,758    | -          | -          | 38,393     | 557,482    | 49,126       | 14,733       | 3,267,574            | 54,385    | 176,220     | 12,772,137         | 5,222,062         | 1,253,286   | 278,624     | 398,736       | -           |
| White & green ash     | 42,763,445    | 48,873     | 167,710    | 20,684     | 25,479     | 7,382        | 15,657       | 395,443              | 17,809    | 2,406,205   | 11,254,580         | 26,424,860        | 1,671,931   | 248,225     | 58,607        | -           |
| Sycamore              | 1,056,903     | -          | -          | -          | -          | -            | -            | -                    | -         | 47,484      | 720,327            | 289,092           | -           | -           | -             | -           |
| Cottonwood            | 5,938,706     | 7,643      | -          | -          | 1,753      | 5,056        | 3,033        | 12,490               | -         | 310,310     | 3,566,693          | 1,817,829         | 182,525     | 27,413      | 6,837         | -           |
| Willow                | 2,977,571     | -          | 43,694     | -          | -          | -            | -            | -                    | -         | 88,703      | 2,009,980          | 752,372           | 43,621      | 10,677      | 6,192         | -           |
| Hackberry             | 258,060       | -          | -          | -          | -          | -            | -            | -                    | -         | -           | -                  | -                 | -           | -           | -             | -           |
| Balsam poplar         | 18,314,143    | 154,970    | 61,778     | 112,817    | 878,222    | 183,612      | 121,020      | 2,624,200            | 62,431    | 58,411      | 1,659,206          | 1,774,112         | 4,097,982   | 852,212     | 5,673,170     | -           |
| Bigtooth aspen        | 59,718,273    | 274,391    | 1,152,217  | 424,932    | 249,647    | 21,478       | 74,791       | 193,395              | 6,813     | 8,139,556   | 913,805            | 12,735,166        | 34,778,263  | 701,279     | 52,540        | -           |
| Quaking aspen         | 110,530,046   | 1,005,950  | 1,583,319  | 945,999    | 3,900,805  | 1,167,436    | 1,198,580    | 3,046,430            | 94,667    | 2,111,450   | 4,992,347          | 24,691,813        | 62,416,943  | 2,258,553   | 1,105,573     | 10,181      |
| Paper birch           | 49,286,234    | 140,974    | 529,891    | 724,235    | 2,965,112  | 767,922      | 866,565      | 6,048,686            | 183,090   | 1,165,089   | 2,965,872          | 12,245,630        | 9,324,530   | 10,744,267  | 614,371       | -           |
| Tupelo                | 507,588       | -          | -          | -          | -          | -            | -            | -                    | -         | 134,818     | 189,195            | 115,275           | 47,358      | 20,942      | -             | -           |
| Black cherry          | 30,649,968    | 604,711    | 845,311    | 79,242     | 377,631    | 142,058      | 82,511       | 135,684              | 25,661    | 3,907,045   | 1,344,853          | 20,965,371        | 2,047,600   | 64,035      | 27,980        | 275         |
| Black walnut          | 2,862,688     | 8,886      | 7,252      | -          | -          | -            | -            | 2,854                | -         | 1,544,061   | 58,949             | 1,240,686         | -           | -           | -             | -           |
| Butternut             | 520,170       | 23,462     | -          | -          | -          | -            | -            | 18,000               | -         | 122,413     | 94,841             | 261,454           | -           | -           | -             | -           |
| Yellow-poplar         | 1,751,821     | 16,836     | 3,736      | -          | -          | -            | -            | -                    | -         | 171,051     | 296,634            | 1,263,564         | -           | -           | -             | -           |
| Sassafras             | 3,931,639     | 141,629    | 54,047     | 464        | -          | -            | -            | -                    | -         | 1,397,148   | 76,790             | 2,214,566         | 46,995      | -           | -             | -           |
| Other hardwoods       | 2,934,432     | 16,892     | 29,116     | -          | 5,118      | 3,330        | -            | 8,055                | 137       | 397,695     | 906,975            | 1,477,657         | 53,967      | -           | 35,490        | -           |
| Total hardwoods       | 1,132,914,991 | 6,612,904  | 12,032,261 | 5,609,146  | 13,521,713 | 3,274,268    | 3,027,339    | 23,370,484           | 633,491   | 182,065,230 | 104,142,607        | 617,329,208       | 152,560,783 | 20,230,490  | 8,486,804     | 18,263      |
| Noncommercial species | 13,036,811    | 57,257     | 57,495     | 64,220     | 89,023     | 21,598       | 30,436       | 111,133              | 4,452     | 964,051     | 1,200,942          | 9,458,660         | 861,623     | 71,399      | 43,861        | 661         |
| All species           | 1,494,944,475 | 35,434,119 | 65,447,891 | 17,634,977 | 35,444,084 | 8,732,783    | 20,477,318   | 108,504,191          | 5,950,741 | 170,609,769 | 118,459,506        | 695,306,867       | 175,785,575 | 25,861,653  | 11,229,051    | 65,950      |

Table 76. -- All live tree biomass on timberland by species group and tree biomass component (in green tons), Michigan, 1993  
(In green tons)

| Species group                | All components       | Tree biomass component  |                   |                     |                    |                  | Nongrowing-stock trees |                   |                   |
|------------------------------|----------------------|-------------------------|-------------------|---------------------|--------------------|------------------|------------------------|-------------------|-------------------|
|                              |                      | All live 1-5-inch trees |                   | Growing-stock trees |                    | Stumps           | Boles                  |                   | Tops and limbs    |
|                              |                      |                         |                   | Stumps              | Boles              |                  | Boles                  | Stumps            |                   |
| <b>Softwoods</b>             |                      |                         |                   |                     |                    |                  |                        |                   |                   |
| Jack pine                    | 26,340,397           | 4,751,797               | 1,300,882         | 3,095,470           | 16,662,059         | 2,049,836        | 1,316,486              | 100,445           | 158,892           |
| Red pine                     | 58,241,937           | 4,724,300               | 3,095,470         | 1,484,542           | 44,204,805         | 5,296,291        | 772,116                | 55,234            | 93,721            |
| White pine                   | 32,706,732           | 2,968,459               | 1,484,542         | 1,484,542           | 23,554,852         | 2,527,119        | 1,847,955              | 123,894           | 199,911           |
| White spruce                 | 19,818,359           | 2,557,044               | 1,120,901         | 868,649             | 12,456,015         | 3,341,257        | 251,460                | 23,603            | 68,079            |
| Black spruce                 | 20,975,927           | 7,212,983               | 2,410,530         | 2,410,530           | 9,522,377          | 3,109,738        | 185,662                | 16,485            | 60,033            |
| Balsam fir                   | 53,715,863           | 20,745,445              | 1,779,681         | 21,379,050          | 22,663,630         | 7,161,340        | 526,912                | 52,114            | 155,892           |
| Hemlock                      | 33,869,318           | 1,631,389               | 2,202,383         | 450,796             | 5,524,017          | 690,781          | 3,070,368              | 264,797           | 742,813           |
| Tamarack                     | 9,497,484            | 39,677                  | 6,755             | 72,506              | 23,371             | 23,371           | 524,654                | 41,650            | 63,203            |
| Eastern redcedar             | 153,143              | 19,874,638              | 5,213,322         | 38,635,523          | 11,532,152         | 1,082,455        | 7,945                  | 642               | 2,247             |
| Northern white-cedar         | 87,454,045           | 1,362,307               | 283,165           | 2,877,710           | 893,472            | 54,951           | 8,719,264              | 574,204           | 2,396,691         |
| Other softwoods              | 6,219,468            | 68,070,422              | 18,014,693        | 197,552,544         | 41,626,577         | 1,816,270        | 17,797,026             | 4,115,141         | 173,659           |
| <b>Total softwoods</b>       | <b>348,992,673</b>   |                         |                   |                     |                    |                  |                        |                   |                   |
| <b>Hardwoods</b>             |                      |                         |                   |                     |                    |                  |                        |                   |                   |
| Select white oak             | 48,173,960           | 2,477,245               | 2,529,518         | 29,721,599          | 8,769,679          | 269,877          | 3,496,879              | 909,163           | 5,110             |
| Other white oak              | 60,365               | 3,918                   | 2,405             | 23,400              | 8,514              | 1,627            | 15,391                 | 5,628,218         | 1,557,920         |
| Select red oak               | 95,159,722           | 2,673,185               | 4,581,421         | 62,150,222          | 18,162,143         | 406,613          | 1,828,692              | 152,101           | 524,936           |
| Other red oak                | 25,043,609           | 910,699                 | 1,281,249         | 15,688,425          | 4,657,507          | 14,316           | 221,539                | 124,470           | 33,427            |
| Select hickory               | 5,333,366            | 240,362                 | 250,077           | 3,484,258           | 1,059,981          | 7,691            | 1,854,730              | 141,539           | 558,156           |
| Other hickory                | 3,572,500            | 249,108                 | 168,100           | 2,277,924           | 711,780            | 364,902          | 5,008,638              | 7,988,496         | 2,328,725         |
| Basswood                     | 36,434,255           | 1,653,391               | 1,792,257         | 23,139,371          | 7,294,811          | 14,539           | 1,393,199              | 5,862,012         | 5,288,642         |
| Beech                        | 31,211,534           | 1,904,635               | 1,245,228         | 16,415,052          | 4,879,880          | 117,826          | 1,373,797              | 18,248,182        | 17,553,977        |
| Yellow birch                 | 39,957,689           | 2,812,622               | 1,574,130         | 18,752,836          | 8,583,893          | 1,318,549        | 1,254,165              | 132,043           | 498,595           |
| Hard maple                   | 262,976,543          | 24,190,660              | 10,984,666        | 151,699,469         | 49,673,005         | 37,157,176       | 48,978                 | 190,743           | 220,391           |
| Soft maple                   | 206,351,790          | 23,533,105              | 8,092,603         | 113,534,578         | 3,651,212          | 2,660            | 839,576                | 72,953            | -                 |
| Elm                          | 20,555,213           | 5,111,026               | 954,272           | 9,446,986           | 3,267,300          | 191,102          | 1,836,866              | 11,968            | 11,968            |
| Black ash                    | 24,082,758           | 7,162,623               | 1,073,401         | 10,174,679          | 7,997,439          | 191,102          | 190,743                | 48,749            | 48,749            |
| White & green ash            | 42,763,445           | 5,007,724               | 1,873,448         | 25,360,428          | 7,997,439          | 191,102          | 839,576                | 220,391           | -                 |
| Sycamore                     | 1,056,903            | 2,198                   | 39,610            | 760,387             | 1,091,958          | 1,091,958        | 48,978                 | 11,968            | 11,968            |
| Cottonwood                   | 5,938,706            | 131,413                 | 352,998           | 4,106,682           | 1,091,958          | 16,163           | 190,743                | 48,749            | 48,749            |
| Willow                       | 2,977,571            | 111,752                 | 114,463           | 1,270,480           | 347,956            | 72,953           | 839,576                | 220,391           | -                 |
| Hackberry                    | 258,060              | 44,481                  | 13,922            | 148,018             | 51,639             | -                | -                      | -                 | -                 |
| Balsam poplar                | 18,314,143           | 1,603,495               | 622,616           | 11,245,884          | 3,509,048          | 53,369           | 981,981                | 297,750           | 297,750           |
| Bigtooth aspen               | 59,718,273           | 5,725,098               | 1,981,384         | 38,265,690          | 9,294,256          | 176,657          | 3,478,540              | 796,648           | 796,648           |
| Quaking aspen                | 110,530,046          | 15,622,874              | 3,861,748         | 61,503,520          | 15,243,731         | 655,618          | 11,085,424             | 2,557,131         | 2,557,131         |
| Paper birch                  | 49,286,234           | 4,230,707               | 2,065,652         | 27,990,354          | 9,756,726          | 269,792          | 3,728,642              | 1,244,361         | 1,244,361         |
| Tupelo                       | 507,588              | 61,120                  | 21,511            | 218,477             | 76,481             | 7,773            | 92,252                 | 29,974            | 29,974            |
| Black cherry                 | 30,649,968           | 3,681,612               | 999,440           | 14,399,385          | 4,746,221          | 352,674          | 4,866,220              | 1,604,416         | 1,604,416         |
| Black walnut                 | 2,862,688            | 96,033                  | 119,799           | 1,800,775           | 565,593            | 13,857           | 208,881                | 57,750            | 57,750            |
| Bulldog                      | 520,170              | 59,819                  | 15,804            | 240,775             | 74,741             | 5,967            | 95,102                 | 27,962            | 27,962            |
| Yellow-poplar                | 1,751,821            | 48,139                  | 73,955            | 1,246,606           | 343,152            | 1,481            | 31,457                 | 7,031             | 7,031             |
| Sassafras                    | 3,931,639            | 1,112,871               | 135,945           | 1,412,820           | 503,326            | 50,814           | 527,833                | 188,030           | 188,030           |
| Other hardwoods              | 2,934,432            | 723,545                 | 86,080            | 885,008             | 317,267            | 57,472           | 649,280                | 215,780           | 215,780           |
| <b>Total hardwoods</b>       | <b>1,132,914,991</b> | <b>111,185,460</b>      | <b>46,907,702</b> | <b>647,364,088</b>  | <b>199,257,611</b> | <b>6,651,387</b> | <b>94,258,949</b>      | <b>27,289,794</b> | <b>27,289,794</b> |
| <b>Noncommercial species</b> | <b>13,036,811</b>    | <b>7,293,422</b>        | <b>-</b>          | <b>-</b>            | <b>-</b>           | <b>405,401</b>   | <b>3,852,325</b>       | <b>1,485,663</b>  | <b>1,485,663</b>  |
| <b>All species</b>           | <b>1,494,944,475</b> | <b>186,549,304</b>      | <b>64,922,395</b> | <b>844,916,632</b>  | <b>240,884,188</b> | <b>8,873,058</b> | <b>115,908,300</b>     | <b>32,890,596</b> | <b>32,890,596</b> |

Table 77. -- All live tree biomass on timberland by species group and tree biomass component (in thousand cubic feet), Michigan, 1993  
(In thousand cubic feet)

| Species group          | All components | Tree biomass component |           |                     |                |         |                        |                |
|------------------------|----------------|------------------------|-----------|---------------------|----------------|---------|------------------------|----------------|
|                        |                | All live               |           | Growing-stock trees |                |         | Nongrowing-stock trees |                |
|                        |                | 1-5-inch trees         | Stumps    | Boles               | Tops and limbs | Stumps  | Boles                  | Tops and limbs |
|                        |                |                        |           |                     |                |         |                        |                |
| Softwoods              |                |                        |           |                     |                |         |                        |                |
| Jack pine              | 1,146,166      | 207,154                | 56,550    | 724,718             | 89,207         | 4,368   | 57,260                 | 6,909          |
| Red pine               | 2,526,125      | 211,432                | 133,792   | 1,911,933           | 229,130        | 2,381   | 33,398                 | 4,059          |
| White pine             | 1,448,491      | 132,819                | 65,658    | 1,042,118           | 111,819        | 5,484   | 81,751                 | 8,842          |
| White spruce           | 881,134        | 115,522                | 49,734    | 552,469             | 148,188        | 1,052   | 11,152                 | 3,017          |
| Black spruce           | 929,593        | 319,558                | 38,580    | 422,045             | 137,790        | 730     | 8,228                  | 2,662          |
| Balsam fir             | 2,290,971      | 885,360                | 102,825   | 966,169             | 305,285        | 2,237   | 22,455                 | 6,640          |
| Hemlock                | 1,341,005      | 64,727                 | 70,480    | 846,386             | 197,985        | 10,498  | 121,533                | 29,396         |
| Tamarack               | 364,495        | 87,036                 | 17,128    | 210,098             | 26,296         | 1,581   | 19,950                 | 2,406          |
| Eastern redcedar       | 7,179          | 1,864                  | 312       | 3,398               | 1,097          | 29      | 373                    | 106            |
| Northern white-cedar   | 4,828,192      | 1,096,023              | 287,841   | 2,133,726           | 636,919        | 59,816  | 481,526                | 132,341        |
| Other softwoods        | 283,876        | 62,121                 | 12,939    | 131,381             | 40,790         | 2,505   | 26,216                 | 7,924          |
| Total softwoods        | 16,047,227     | 3,183,616              | 835,839   | 8,944,441           | 1,924,506      | 90,681  | 863,842                | 204,302        |
| Hardwoods              |                |                        |           |                     |                |         |                        |                |
| Select white oak       | 1,658,729      | 85,304                 | 87,060    | 1,023,385           | 301,978        | 9,300   | 120,402                | 31,300         |
| Other white oak        | 2,078          | 134                    | 82        | 806                 | 294            | 56      | 530                    | 176            |
| Select red oak         | 2,957,552      | 83,124                 | 142,402   | 1,931,609           | 564,442        | 12,629  | 174,922                | 48,424         |
| Other red oak          | 777,374        | 28,305                 | 39,784    | 486,935             | 144,578        | 4,720   | 56,758                 | 16,294         |
| Select hickory         | 168,196        | 7,594                  | 7,898     | 109,866             | 33,419         | 452     | 6,985                  | 1,982          |
| Other hickory          | 121,100        | 8,441                  | 5,705     | 77,217              | 24,125         | 262     | 4,218                  | 1,132          |
| Basswood               | 1,727,473      | 79,343                 | 84,967    | 1,096,475           | 345,646        | 6,699   | 87,890                 | 26,453         |
| Beech                  | 1,056,795      | 64,460                 | 42,155    | 555,825             | 165,233        | 12,348  | 169,600                | 47,174         |
| Yellow birch           | 1,305,438      | 91,786                 | 51,460    | 612,705             | 191,273        | 21,134  | 260,986                | 76,094         |
| Hard maple             | 8,377,778      | 771,328                | 349,949   | 4,832,293           | 1,582,339      | 41,997  | 613,126                | 186,746        |
| Soft maple             | 7,458,881      | 849,601                | 292,530   | 4,104,462           | 1,343,400      | 43,030  | 634,660                | 191,198        |
| Elm                    | 754,737        | 193,676                | 34,671    | 343,193             | 118,692        | 4,277   | 45,561                 | 14,667         |
| Black ash              | 963,402        | 286,595                | 42,947    | 406,973             | 146,046        | 5,957   | 54,949                 | 19,935         |
| White & green ash      | 1,674,421      | 200,775                | 73,100    | 989,871             | 312,145        | 5,155   | 71,693                 | 21,682         |
| Sycamore               | 36,532         | 76                     | 1,363     | 26,286              | 6,608          | 90      | 1,695                  | 414            |
| Cottonwood             | 232,100        | 5,141                  | 13,813    | 160,497             | 42,659         | 631     | 7,456                  | 1,903          |
| Willow                 | 124,642        | 4,711                  | 4,788     | 53,173              | 14,561         | 3,055   | 35,133                 | 9,221          |
| Hackberry              | 9,901          | 1,705                  | 540       | 5,678               | 1,978          | -       | -                      | -              |
| Balsam poplar          | 695,396        | 61,767                 | 23,610    | 426,423             | 133,048        | 2,030   | 37,235                 | 11,283         |
| Bigtooth aspen         | 2,384,946      | 231,035                | 79,077    | 1,526,473           | 370,770        | 7,044   | 138,772                | 31,775         |
| Quaking aspen          | 4,416,647      | 630,590                | 154,081   | 2,453,473           | 608,104        | 26,165  | 442,242                | 101,992        |
| Paper birch            | 1,806,977      | 155,161                | 75,740    | 1,026,161           | 357,706        | 9,887   | 136,704                | 45,618         |
| Tupelo                 | 17,503         | 2,110                  | 738       | 7,535               | 2,638          | 268     | 3,181                  | 1,033          |
| Black cherry           | 1,246,137      | 149,452                | 40,645    | 585,562             | 193,002        | 14,346  | 197,885                | 65,245         |
| Black walnut           | 106,979        | 3,764                  | 4,466     | 67,182              | 21,101         | 519     | 7,794                  | 2,153          |
| Butternut              | 23,234         | 2,673                  | 710       | 10,752              | 3,337          | 267     | 4,247                  | 1,248          |
| Yellow-poplar          | 67,215         | 1,846                  | 2,839     | 47,829              | 13,167         | 58      | 1,207                  | 269            |
| Sassafras              | 170,464        | 48,256                 | 5,886     | 61,260              | 21,824         | 2,199   | 22,888                 | 8,151          |
| Other hardwoods        | 127,203        | 31,374                 | 3,713     | 38,361              | 13,754         | 2,498   | 28,147                 | 9,356          |
| Total hardwoods        | 40,469,830     | 4,080,127              | 1,666,719 | 23,068,260          | 7,077,867      | 237,073 | 3,366,866              | 972,918        |
| Non-commercial species |                |                        |           |                     |                |         |                        |                |
|                        | 521,537        | 291,814                | -         | -                   | -              | 16,202  | 154,106                | 59,415         |
| All species            | 57,038,594     | 7,555,557              | 2,502,558 | 32,012,701          | 9,002,373      | 343,956 | 4,384,814              | 1,236,635      |

Table 78. -- All live shrub' and tree seedling biomass yields on timberland by species group and forest type, Michigan, 1993

(In pounds per acre green weight)

| Species group           | Mean for all types | Forest type |          |            |            |              |              |                      |          |             |                    |                   |       |             |                           |
|-------------------------|--------------------|-------------|----------|------------|------------|--------------|--------------|----------------------|----------|-------------|--------------------|-------------------|-------|-------------|---------------------------|
|                         |                    | Jack pine   | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-beech-birch | Aspen | Paper birch | Balsam Non-poplar stocked |
| Commercial tree species |                    |             |          |            |            |              |              |                      |          |             |                    |                   |       |             |                           |
| Jack pine               | 10                 | 336         | 6        | -          | -          | -            | -            | -                    | -        | -           | -                  | -                 | 1     | -           | -                         |
| Red pine                | -                  | -           | 11       | -          | -          | -            | -            | -                    | -        | -           | -                  | -                 | -     | 1           | -                         |
| White pine              | 16                 | 1           | -        | 129        | -          | -            | 40           | -                    | -        | 59          | -                  | 18                | 4     | -           | -                         |
| White spruce            | 15                 | -           | -        | 14         | 70         | 182          | -            | 9                    | -        | -           | 1                  | 8                 | 29    | 1           | -                         |
| Black spruce            | 58                 | 17          | 9        | 53         | 48         | -            | 814          | 21                   | 310      | -           | 10                 | 9                 | 28    | -           | 1                         |
| Balsam fir              | 381                | 18          | 43       | 643        | 1,295      | 955          | 261          | 986                  | 84       | 12          | 130                | 235               | 437   | 801         | 175                       |
| Hemlock                 | 25                 | -           | -        | 14         | 9          | -            | -            | 3                    | -        | -           | 6                  | 57                | -     | 28          | -                         |
| Tamarack                | 6                  | 1           | -        | -          | 3          | -            | 63           | 2                    | 334      | -           | -                  | -                 | -     | -           | -                         |
| Northern white-cedar    | 120                | -           | -        | 4          | 16         | 433          | 30           | 977                  | -        | -           | 53                 | 28                | 3     | 8           | 7                         |
| Select white oak        | 3                  | 1           | 15       | 1          | -          | -            | -            | -                    | -        | 34          | -                  | 1                 | 1     | -           | -                         |
| Other red oak           | -                  | 2           | 5        | -          | -          | -            | -            | -                    | -        | -           | -                  | -                 | -     | -           | -                         |
| Beech                   | 56                 | 1           | 194      | 4          | -          | -            | -            | -                    | -        | -           | -                  | 100               | 43    | -           | -                         |
| Yellow birch            | 29                 | -           | 1        | 3          | 16         | -            | -            | 1                    | -        | -           | 1                  | 69                | 2     | -           | -                         |
| Hard maple              | 326                | 168         | 96       | 210        | 7          | 12           | 5            | 4                    | -        | 37          | 80                 | 697               | 125   | 3           | 4                         |
| Soft maple              | 229                | 39          | 132      | 276        | 150        | 57           | 162          | 47                   | 114      | 250         | 127                | 242               | 458   | 53          | 85                        |
| Elm                     | 92                 | -           | -        | -          | -          | -            | -            | -                    | -        | -           | 17                 | 218               | 12    | -           | 2                         |
| Black ash               | 102                | -           | 3        | 4          | 75         | 23           | -            | 116                  | -        | -           | 812                | 71                | 9     | 74          | 467                       |
| White & green ash       | 48                 | -           | -        | 6          | 2          | 42           | -            | 9                    | -        | 32          | 46                 | 80                | 55    | 17          | 33                        |
| Cottonwood              | 3                  | -           | -        | -          | -          | -            | -            | -                    | -        | -           | 47                 | -                 | -     | -           | -                         |
| Balsam poplar           | 33                 | 1           | -        | -          | 1          | -            | 3            | 1                    | -        | -           | 23                 | 21                | 90    | 26          | 1,252                     |
| Bigtooth aspen          | 17                 | -           | 22       | 21         | -          | -            | -            | -                    | -        | 7           | -                  | 6                 | 80    | -           | -                         |
| Quaking aspen           | 133                | 138         | 36       | 16         | 2          | 29           | 26           | 1                    | -        | 4           | 5                  | 55                | 604   | 115         | 13                        |
| Paper birch             | 12                 | -           | -        | 19         | 1          | 15           | 1            | 3                    | 12       | -           | -                  | 12                | 24    | 207         | 35                        |
| Tupelo                  | -                  | -           | -        | -          | -          | -            | -            | -                    | -        | -           | -                  | 1                 | -     | -           | -                         |
| Black cherry            | 62                 | 28          | 114      | 8          | 18         | 8            | 44           | 4                    | -        | 102         | 8                  | 79                | 99    | 4           | 1                         |
| Sassafras               | -                  | -           | -        | 2          | -          | -            | -            | -                    | -        | 7           | -                  | -                 | -     | -           | -                         |
| Total                   | 1,776              | 751         | 687      | 1,427      | 1,713      | 1,756        | 1,449        | 2,184                | 854      | 544         | 1,366              | 2,007             | 2,104 | 1,338       | 2,075                     |

(Table 78 continued on next page)

(Table 78 continued)

| Forest type                 |                    |           |          |            |            |              |              |             |          |             |                    |                   |       |             |               |             |
|-----------------------------|--------------------|-----------|----------|------------|------------|--------------|--------------|-------------|----------|-------------|--------------------|-------------------|-------|-------------|---------------|-------------|
| Species group               | Mean for all types | Northern  |          |            |            |              |              |             |          |             |                    |                   |       |             |               |             |
|                             |                    | Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | white-cedar | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-beech-birch | Aspen | Paper birch | Balsam poplar | Non-stocked |
| Non-commercial tree species |                    |           |          |            |            |              |              |             |          |             |                    |                   |       |             |               |             |
| Striped maple               | 5                  | -         | -        | -          | -          | -            | -            | -           | -        | -           | -                  | 10                | 4     | -           | 1             | -           |
| Mountain maple              | 62                 | 1         | -        | 1          | 63         | -            | 48           | 96          | -        | -           | 191                | 38                | 116   | -           | 1             | -           |
| Ailanthus                   | -                  | -         | -        | -          | -          | -            | -            | 1           | -        | -           | -                  | -                 | -     | -           | -             | -           |
| American hornbeam           | 8                  | -         | -        | -          | -          | -            | -            | -           | -        | -           | 6                  | 17                | 5     | -           | -             | -           |
| Apple                       | -                  | 1         | -        | -          | -          | -            | -            | -           | -        | -           | -                  | -                 | -     | 40          | -             | -           |
| Hawthorn                    | 2                  | -         | 33       | -          | 1          | -            | -            | -           | -        | 1           | 1                  | -                 | 3     | -           | -             | -           |
| Eastern hophornbeam         | 55                 | -         | 3        | -          | -          | 1            | -            | 22          | -        | 18          | 73                 | 106               | 22    | -           | 4             | -           |
| Pin cherry                  | 10                 | 2         | 2        | -          | -          | -            | -            | -           | -        | -           | -                  | 22                | 6     | -           | -             | -           |
| Choke cherry                | 95                 | 15        | 39       | 19         | 19         | 12           | 4            | 49          | 18       | 1           | 69                 | 34                | 405   | 14          | 26            | -           |
| Mountain ash                | 1                  | -         | -        | -          | -          | -            | 2            | -           | -        | -           | -                  | 2                 | -     | -           | -             | -           |
| Noncommercial willow        | 5                  | -         | -        | -          | -          | -            | -            | -           | -        | -           | 62                 | 2                 | -     | -           | -             | -           |
| Total                       | 243                | 19        | 77       | 20         | 83         | 13           | 54           | 168         | 18       | 20          | 402                | 229               | 563   | 54          | 32            | -           |
| Tall shrub species          |                    |           |          |            |            |              |              |             |          |             |                    |                   |       |             |               |             |
| Speckled alder              | 990                | 28        | -        | 3,148      | 3,012      | 1,610        | 2,712        | 1,799       | 5,135    | 10          | 2,519              | 224               | 545   | 129         | 10,360        | -           |
| Swamp birch                 | 3                  | 29        | -        | -          | -          | -            | 26           | 1           | -        | -           | 5                  | -                 | -     | 2           | -             | -           |
| Dogwood                     | 56                 | -         | -        | -          | 48         | 1            | 13           | 149         | 228      | -           | 290                | 19                | 48    | 136         | 237           | -           |
| Black alder                 | 42                 | -         | 2        | -          | 441        | -            | 60           | 24          | 749      | -           | 67                 | -                 | 46    | 68          | -             | -           |
| Sand cherry                 | 1                  | 10        | -        | -          | -          | -            | -            | -           | -        | -           | -                  | 2                 | -     | -           | -             | -           |
| Witch hazel                 | 13                 | -         | -        | -          | 1          | -            | -            | -           | -        | 19          | -                  | -                 | 34    | -           | -             | -           |
| Juneberry                   | 86                 | 10        | 31       | 156        | 22         | 17           | 2            | 3           | 49       | 637         | 34                 | 67                | 138   | 7           | 49            | -           |
| Hazel                       | 113                | 5         | 134      | 149        | 147        | 14           | 12           | 22          | -        | -           | 108                | 105               | 264   | 7           | -             | -           |
| Buckthorn spp.              | 7                  | -         | -        | -          | 1          | -            | 112          | 8           | -        | -           | -                  | 1                 | -     | 5           | -             | -           |
| Leatherwood                 | 39                 | -         | -        | -          | -          | -            | -            | -           | -        | 1           | -                  | 40                | 137   | -           | 12            | -           |
| Viburnum                    | 11                 | -         | 1        | 22         | 5          | 1            | 47           | 1           | 76       | 3           | 17                 | 12                | 3     | 1           | 14            | -           |
| Elderberry                  | 9                  | -         | -        | -          | -          | -            | 1            | -           | -        | -           | 6                  | 21                | -     | -           | -             | -           |
| Sumac                       | 3                  | -         | -        | -          | 5          | -            | -            | 1           | -        | -           | -                  | 5                 | 2     | -           | -             | -           |
| Buffaloberry                | -                  | -         | -        | -          | -          | -            | -            | -           | -        | -           | -                  | -                 | 1     | -           | -             | -           |
| Russian olive               | 3                  | -         | -        | -          | -          | -            | -            | -           | -        | -           | -                  | 8                 | -     | -           | -             | -           |
| Total                       | 1,376              | 82        | 168      | 3,475      | 3,682      | 1,643        | 2,985        | 2,008       | 6,237    | 670         | 3,046              | 519               | 1,218 | 355         | 10,672        | -           |
| Low shrub species           |                    |           |          |            |            |              |              |             |          |             |                    |                   |       |             |               |             |
| Yew                         | 1                  | -         | -        | -          | -          | -            | -            | 3           | -        | -           | -                  | 2                 | -     | -           | 3             | -           |
| Sweetfern                   | 1                  | 18        | 6        | 1          | 1          | -            | -            | -           | -        | 6           | -                  | -                 | 1     | -           | -             | 58          |
| Gooseberry-currant          | 2                  | 2         | -        | -          | 4          | 2            | 1            | 3           | -        | -           | 2                  | 1                 | 5     | 8           | 16            | -           |
| Black huckleberry           | -                  | 1         | -        | 6          | -          | -            | -            | -           | -        | 1           | -                  | -                 | 1     | -           | -             | -           |
| Blueberry                   | 35                 | 207       | 70       | 70         | 34         | 14           | 166          | 4           | 64       | 87          | 11                 | 10                | 28    | 5           | -             | 149         |
| Poison ivy                  | 1                  | -         | -        | 1          | -          | -            | -            | 1           | -        | -           | 6                  | -                 | 4     | -           | 7             | -           |
| Bearberry                   | -                  | 5         | 3        | -          | -          | -            | -            | -           | -        | -           | -                  | -                 | 1     | -           | -             | -           |
| Grape                       | 1                  | -         | -        | -          | -          | -            | -            | -           | -        | -           | -                  | -                 | 1     | -           | -             | -           |
| Misc. low shrubs            | 82                 | 86        | 53       | 123        | 58         | 14           | 182          | 69          | 125      | 44          | 70                 | 40                | 167   | 135         | 344           | 150         |
| Total                       | 123                | 319       | 132      | 201        | 97         | 30           | 349          | 80          | 189      | 138         | 89                 | 54                | 208   | 148         | 370           | 357         |
| All species                 | 3,518              | 1,171     | 1,064    | 5,123      | 5,575      | 3,442        | 4,837        | 4,440       | 7,298    | 1,372       | 4,903              | 2,809             | 4,093 | 1,895       | 13,149        | 357         |

<sup>1</sup> Includes trees less than 1.0 inch d.b.h.

Table 79. -- Sampling errors<sup>1</sup> for Forest Survey Unit and county totals of area of timberland, volume, average net annual growth, and average annual removals on timberland, Michigan, 1993

(Sampling error in percent)

| Forest Survey<br>Unit and county | Area | Growing stock |                                 |                               | Sawtimber |                                 |                               |
|----------------------------------|------|---------------|---------------------------------|-------------------------------|-----------|---------------------------------|-------------------------------|
|                                  |      | Volume        | Average<br>net annual<br>growth | Average<br>annual<br>removals | Volume    | Average<br>net annual<br>growth | Average<br>annual<br>removals |
| Eastern Upper Peninsula          |      |               |                                 |                               |           |                                 |                               |
| Alger                            | 2.05 | 3.37          | 5.39                            | 16.63                         | 4.63      | 6.10                            | 16.07                         |
| Chippewa                         | 1.67 | 3.11          | 4.91                            | 17.67                         | 4.72      | 5.55                            | 21.52                         |
| Delta                            | 1.82 | 3.42          | 5.14                            | 17.89                         | 5.45      | 5.82                            | 21.41                         |
| Luce                             | 2.06 | 3.70          | 6.28                            | 19.44                         | 5.09      | 7.11                            | 18.50                         |
| Mackinac                         | 1.94 | 3.55          | 5.74                            | 20.72                         | 5.43      | 6.49                            | 26.93                         |
| Menominee                        | 1.94 | 3.71          | 5.36                            | 20.22                         | 6.24      | 6.06                            | 26.94                         |
| Schoolcraft                      | 1.94 | 3.72          | 5.64                            | 20.58                         | 5.41      | 6.38                            | 22.77                         |
| Total                            | 0.72 | 1.32          | 2.06                            | 7.12                          | 1.97      | 2.33                            | 7.95                          |
| Western Upper Peninsula          |      |               |                                 |                               |           |                                 |                               |
| Baraga                           | 1.66 | 3.05          | 5.00                            | 20.62                         | 4.10      | 4.43                            | 21.86                         |
| Dickinson                        | 1.83 | 3.71          | 5.32                            | 34.66                         | 5.81      | 4.90                            | 70.96                         |
| Gogebic                          | 1.48 | 2.88          | 4.33                            | 27.29                         | 4.21      | 4.04                            | 31.88                         |
| Houghton                         | 1.59 | 2.95          | 4.45                            | 25.00                         | 4.14      | 4.01                            | 28.24                         |
| Iron                             | 1.43 | 2.96          | 4.41                            | 17.95                         | 4.30      | 3.92                            | 21.43                         |
| Keweenaw                         | 2.60 | 4.93          | 8.60                            | 54.39                         | 6.89      | 7.57                            | 66.03                         |
| Marquette                        | 1.15 | 2.24          | 3.34                            | 14.25                         | 3.18      | 3.10                            | 16.67                         |
| Ontonagon                        | 1.38 | 2.70          | 4.03                            | 20.16                         | 3.87      | 3.70                            | 24.42                         |
| Total                            | 0.54 | 1.05          | 1.59                            | 7.68                          | 1.50      | 1.45                            | 9.05                          |
| Northern Lower Peninsula         |      |               |                                 |                               |           |                                 |                               |
| Alcona                           | 2.18 | 5.24          | 7.12                            | 34.26                         | 6.82      | 7.63                            | 39.80                         |
| Alpena                           | 2.56 | 6.60          | 8.68                            | 32.25                         | 8.90      | 10.70                           | 40.11                         |
| Antrim                           | 2.84 | 6.32          | 7.95                            | 48.67                         | 8.87      | 9.91                            | 53.76                         |
| Arenac                           | 3.55 | 9.60          | 11.89                           | 68.90                         | 12.74     | 12.85                           | 86.81                         |
| Bay                              | 5.94 | 15.44         | 18.11                           | 73.59                         | 21.29     | 18.39                           | 85.52                         |
| Benzie                           | 3.34 | 7.70          | 9.21                            | 39.57                         | 10.20     | 11.13                           | 40.88                         |
| Charlevoix                       | 2.99 | 5.98          | 8.62                            | 33.50                         | 7.58      | 9.60                            | 37.74                         |
| Cheboygan                        | 2.12 | 5.54          | 6.98                            | 40.38                         | 7.58      | 8.66                            | 57.02                         |
| Clare                            | 2.49 | 6.40          | 8.10                            | 39.41                         | 8.52      | 9.42                            | 41.71                         |
| Crawford                         | 2.29 | 6.63          | 8.72                            | 37.19                         | 9.08      | 9.81                            | 56.90                         |
| Emmet                            | 2.78 | 6.01          | 7.85                            | 34.80                         | 8.10      | 8.99                            | 37.80                         |
| Gladwin                          | 2.86 | 7.96          | 9.49                            | 40.64                         | 10.91     | 11.33                           | 45.11                         |
| Grand Traverse                   | 2.99 | 7.00          | 8.63                            | 68.43                         | 9.88      | 11.66                           | 85.96                         |
| Iosco                            | 2.51 | 6.53          | 8.64                            | 45.68                         | 8.57      | 9.16                            | 49.86                         |
| Isabella                         | 3.88 | 9.69          | 11.55                           | 108.80                        | 12.11     | 12.46                           | 136.40                        |
| Kalkaska                         | 2.39 | 5.98          | 7.14                            | 43.02                         | 8.61      | 9.44                            | 42.09                         |
| Lake                             | 2.20 | 5.51          | 6.99                            | 28.85                         | 6.89      | 7.71                            | 40.24                         |
| Leelanau                         | 4.16 | 8.72          | 10.74                           | 64.27                         | 10.85     | 12.52                           | 60.36                         |
| Manistee                         | 2.48 | 6.03          | 7.68                            | 40.33                         | 7.83      | 9.05                            | 46.05                         |
| Mason                            | 3.12 | 7.55          | 8.99                            | 45.59                         | 9.91      | 10.08                           | 56.86                         |
| Mecosta                          | 3.06 | 7.93          | 8.90                            | 72.43                         | 10.48     | 11.36                           | 84.10                         |
| Midland                          | 2.95 | 7.62          | 9.40                            | 57.29                         | 9.90      | 10.57                           | 91.00                         |
| Missaukee                        | 2.58 | 6.72          | 7.48                            | 74.30                         | 9.17      | 10.09                           | 85.33                         |
| Montmorency                      | 2.28 | 6.27          | 7.94                            | 39.80                         | 8.47      | 9.51                            | 47.80                         |
| Newaygo                          | 2.15 | 4.97          | 6.51                            | 26.74                         | 6.08      | 7.12                            | 29.70                         |
| Oceana                           | 2.90 | 7.41          | 9.17                            | 43.89                         | 9.60      | 10.79                           | 44.36                         |
| Ogemaw                           | 2.59 | 6.83          | 8.13                            | 30.88                         | 9.70      | 10.46                           | 38.00                         |
| Osceola                          | 2.87 | 7.61          | 9.26                            | 34.68                         | 9.58      | 11.16                           | 41.86                         |
| Oscoda                           | 2.23 | 6.56          | 7.97                            | 31.72                         | 8.29      | 9.27                            | 42.02                         |
| Otsego                           | 2.52 | 5.95          | 7.62                            | 32.28                         | 8.58      | 9.68                            | 36.82                         |
| Presque Isle                     | 2.26 | 5.97          | 8.17                            | 32.84                         | 8.31      | 9.84                            | 40.49                         |
| Roscommon                        | 2.45 | 6.16          | 9.05                            | 39.22                         | 8.02      | 9.34                            | 43.85                         |
| Wexford                          | 2.43 | 5.69          | 6.63                            | 31.62                         | 8.12      | 8.62                            | 43.20                         |
| Total                            | 0.46 | 1.15          | 1.45                            | 6.89                          | 1.53      | 1.71                            | 8.14                          |

(Table 79 continued on next page)

(Table 79 continued)

(Sampling error in percent)

| Forest Survey<br>Unit and county | Growing stock |        |                                 |                               | Sawtimber |                                 |                               |
|----------------------------------|---------------|--------|---------------------------------|-------------------------------|-----------|---------------------------------|-------------------------------|
|                                  | Area          | Volume | Average<br>net annual<br>growth | Average<br>annual<br>removals | Volume    | Average<br>net annual<br>growth | Average<br>annual<br>removals |
| Southern Lower Peninsula         |               |        |                                 |                               |           |                                 |                               |
| Allegan                          | 5.29          | 8.39   | 9.70                            | 45.42                         | 10.89     | 11.13                           | 46.68                         |
| Barry                            | 6.70          | 10.37  | 12.07                           | 48.78                         | 13.30     | 13.53                           | 48.86                         |
| Berrien                          | 8.63          | 12.03  | 13.50                           | 137.86                        | 15.06     | 15.34                           | 125.98                        |
| Branch                           | 9.58          | 15.16  | 18.44                           | 126.58                        | 19.66     | 21.27                           | 160.51                        |
| Calhoun                          | 6.72          | 11.06  | 12.12                           | 95.55                         | 14.66     | 14.33                           | 104.60                        |
| Cass                             | 8.06          | 12.34  | 15.99                           | 164.59                        | 15.61     | 18.43                           | 321.01                        |
| Clinton                          | 9.63          | 18.66  | 20.31                           | -                             | 27.78     | 24.64                           | -                             |
| Eaton                            | 7.80          | 13.24  | 13.34                           | 66.67                         | 18.87     | 17.76                           | 77.89                         |
| Genesee                          | 8.77          | 16.54  | 17.92                           | 109.36                        | 21.53     | 21.88                           | 115.25                        |
| Gratiot                          | 10.07         | 16.83  | 18.43                           | 64.90                         | 22.71     | 20.77                           | 63.24                         |
| Hillsdale                        | 8.21          | 15.75  | 13.92                           | 270.52                        | 20.90     | 16.95                           | 339.96                        |
| Huron                            | 8.80          | 16.20  | 16.74                           | 91.86                         | 22.64     | 19.16                           | 119.90                        |
| Ingham                           | 8.97          | 15.98  | 16.45                           | 64.99                         | 21.06     | 19.38                           | 68.38                         |
| Ionia                            | 8.18          | 14.91  | 14.74                           | 131.63                        | 20.71     | 20.12                           | 130.36                        |
| Jackson                          | 7.79          | 12.88  | 15.11                           | 88.43                         | 16.48     | 17.31                           | 81.93                         |
| Kalamazoo                        | 8.16          | 13.26  | 14.37                           | 143.53                        | 17.38     | 19.00                           | 137.47                        |
| Kent                             | 5.67          | 9.80   | 10.62                           | 56.80                         | 13.06     | 12.68                           | 64.47                         |
| Lapeer                           | 6.76          | 12.99  | 12.00                           | 70.45                         | 17.87     | 15.19                           | 86.27                         |
| Lenawee                          | 9.51          | 14.67  | 17.33                           | 141.47                        | 19.93     | 21.38                           | 134.75                        |
| Livingston                       | 7.28          | 12.08  | 13.22                           | 53.74                         | 14.99     | 15.58                           | 61.38                         |
| Macomb                           | 9.08          | 19.75  | 20.82                           | 129.36                        | 26.46     | 29.19                           | 145.07                        |
| Monroe                           | 11.48         | 17.53  | 20.42                           | 98.15                         | 22.76     | 24.83                           | 93.36                         |
| Montcalm                         | 6.13          | 10.45  | 11.45                           | 35.47                         | 14.07     | 13.62                           | 41.47                         |
| Muskegon                         | 5.59          | 9.45   | 11.13                           | 36.50                         | 12.20     | 12.61                           | 41.63                         |
| Oakland                          | 6.70          | 12.64  | 13.43                           | 96.00                         | 16.86     | 17.82                           | 109.61                        |
| Ottawa                           | 7.95          | 13.43  | 14.41                           | 46.64                         | 17.28     | 16.98                           | 52.32                         |
| Saginaw                          | 7.11          | 13.30  | 14.63                           | 93.32                         | 18.59     | 19.30                           | 203.33                        |
| St. Clair                        | 7.99          | 11.26  | 12.97                           | 101.49                        | 14.77     | 15.81                           | 103.49                        |
| St. Joseph                       | 8.72          | 13.99  | 16.26                           | 88.64                         | 18.13     | 19.20                           | 86.48                         |
| Sanilac                          | 7.91          | 17.15  | 16.76                           | -                             | 27.23     | 24.07                           | -                             |
| Shiawassee                       | 9.97          | 14.84  | 16.58                           | 48.09                         | 18.28     | 18.46                           | 47.56                         |
| Tuscola                          | 6.58          | 12.65  | 12.23                           | 48.75                         | 18.61     | 17.09                           | 63.07                         |
| Van Buren                        | 6.39          | 11.15  | 12.45                           | 100.34                        | 14.80     | 14.86                           | 100.84                        |
| Washtenaw                        | 7.79          | 12.90  | 16.03                           | 66.85                         | 15.69     | 18.40                           | 86.48                         |
| Wayne                            | 12.71         | 19.77  | 20.62                           | 97.48                         | 25.43     | 25.60                           | 106.19                        |
| Total                            | 1.29          | 2.19   | 2.40                            | 11.85                         | 2.89      | 2.90                            | 13.07                         |
| All counties                     | 0.34          | 0.67   | 0.91                            | 4.02                          | 0.94      | 1.06                            | 4.73                          |

<sup>1</sup>Sampling error is not calculated when the estimated removals is equal to 0.

Table 80. -- Current net annual growth of growing stock on timberland by species group and ownership class,  
Michigan, 1992

(In thousand cubic feet)

| Species group        | Total   | Ownership class |               |         |                    |        |                 |            |           |
|----------------------|---------|-----------------|---------------|---------|--------------------|--------|-----------------|------------|-----------|
|                      |         | National forest | Other federal | State   | County & municipal | Indian | Forest industry | Individual | Corporate |
| Softwoods            |         |                 |               |         |                    |        |                 |            |           |
| Jack pine            | 10,995  | 4,190           | 346           | 4,246   | 280                | -      | 93              | 1,371      | 469       |
| Red pine             | 82,601  | 28,007          | 202           | 22,517  | 1,833              | -      | 893             | 24,655     | 4,494     |
| White pine           | 37,266  | 5,681           | 105           | 8,782   | 474                | -      | 1,656           | 16,289     | 4,279     |
| White spruce         | 26,045  | 4,942           | 138           | 4,353   | 170                | 24     | 2,411           | 10,702     | 3,305     |
| Black spruce         | 3,604   | 119             | 6             | 943     | 185                | 5      | 515             | 1,157      | 674       |
| Balsam fir           | 18,031  | 2,194           | 67            | 2,571   | 43                 | 13     | 2,324           | 8,162      | 2,657     |
| Hemlock              | 12,964  | 1,909           | 24            | 1,376   | 185                | 32     | 2,667           | 4,470      | 2,301     |
| Tamarack             | 4,933   | 381             | -             | 1,405   | 82                 | -      | 576             | 1,982      | 507       |
| Eastern redcedar     | 275     | -               | -             | 25      | -                  | -      | -               | 216        | 34        |
| Northern white-cedar | 45,076  | 4,834           | 29            | 11,590  | 348                | 75     | 5,203           | 18,306     | 4,691     |
| Other softwoods      | 7,226   | 61              | -             | 163     | 170                | -      | -               | 6,392      | 440       |
| Total softwoods      | 249,016 | 52,318          | 917           | 57,971  | 3,770              | 149    | 16,338          | 93,702     | 23,851    |
| Hardwoods            |         |                 |               |         |                    |        |                 |            |           |
| Select white oak     | 20,886  | 2,509           | -             | 3,632   | 499                | -      | 87              | 12,277     | 1,882     |
| Other white oak      | 25      | -               | -             | -       | -                  | -      | -               | 25         | -         |
| Select red oak       | 43,554  | 4,436           | 43            | 9,245   | 645                | -      | 658             | 24,005     | 4,522     |
| Other red oak        | 10,039  | 2,413           | 29            | 1,477   | 113                | -      | -               | 5,538      | 469       |
| Select hickory       | 2,075   | -               | -             | 114     | 92                 | -      | -               | 1,665      | 204       |
| Other hickory        | 1,625   | -               | -             | 169     | 23                 | -      | -               | 1,342      | 91        |
| Basswood             | 19,923  | 2,093           | -             | 3,629   | 297                | 27     | 1,572           | 10,085     | 2,220     |
| Beech                | 14,117  | 1,652           | 109           | 2,049   | 136                | -      | 1,140           | 6,840      | 2,191     |
| Yellow birch         | 4,231   | 374             | 20            | 536     | 109                | 10     | 1,269           | 1,317      | 596       |
| Hard maple           | 117,018 | 14,869          | 158           | 15,369  | 1,478              | 176    | 18,696          | 50,298     | 15,974    |
| Soft maple           | 114,759 | 13,316          | 222           | 19,264  | 1,512              | 80     | 7,486           | 59,695     | 13,184    |
| Elm                  | 17,159  | 210             | -1            | 1,385   | 100                | 1      | -158            | 15,282     | 340       |
| Black ash            | 9,757   | 903             | -             | 1,278   | 205                | 56     | 505             | 5,885      | 925       |
| White & green ash    | 38,385  | 1,055           | 9             | 3,462   | 630                | -      | 867             | 28,078     | 4,284     |
| Sycamore             | 569     | -               | -             | -       | -                  | -      | -               | 563        | 6         |
| Cottonwood           | 4,536   | -               | -             | 241     | 91                 | -      | -               | 3,586      | 618       |
| Willow               | 1,191   | 9               | -             | 100     | 15                 | -      | -               | 977        | 90        |
| Hackberry            | 120     | -               | -             | -       | -                  | -      | -               | 120        | -         |
| Balsam poplar        | 7,885   | 751             | -             | 1,465   | -10                | 16     | 539             | 4,427      | 697       |
| Bigtooth aspen       | 44,178  | 3,859           | 68            | 12,366  | 648                | 11     | 364             | 22,898     | 3,964     |
| Quaking aspen        | 67,327  | 7,976           | 306           | 14,674  | 529                | 33     | 4,313           | 32,195     | 7,301     |
| Paper birch          | 14,053  | 1,239           | 56            | 2,780   | 161                | 8      | 691             | 7,345      | 1,773     |
| Tupelo               | 311     | -               | -             | 38      | -                  | -      | -               | 273        | -         |
| Black cherry         | 14,933  | 1,172           | 15            | 1,986   | 232                | 2      | 323             | 9,311      | 1,892     |
| Black walnut         | 1,570   | -               | -             | 137     | 77                 | -      | -               | 1,282      | 74        |
| Butternut            | 295     | 3               | -             | -       | -                  | -      | -               | 261        | 31        |
| Yellow-poplar        | 1,086   | -               | -             | 42      | 9                  | -      | -               | 1,028      | 7         |
| Sassafras            | 2,477   | 6               | -             | 476     | 43                 | -      | -               | 1,918      | 34        |
| Other hardwoods      | 1,910   | -               | -             | 36      | 67                 | -      | 5               | 1,529      | 273       |
| Total hardwoods      | 575,994 | 58,845          | 1,034         | 95,950  | 7,701              | 420    | 38,357          | 310,045    | 63,642    |
| All species          | 825,010 | 111,163         | 1,951         | 153,921 | 11,471             | 569    | 54,695          | 403,747    | 87,493    |

Table 81. -- Current net annual growth of sawtimber on timberland by species group and ownership class,  
Michigan, 1992

(In thousand board feet)<sup>1</sup>

|                      |           | Ownership class |               |         |                    |        |                 |            |           |
|----------------------|-----------|-----------------|---------------|---------|--------------------|--------|-----------------|------------|-----------|
| Species group        | Total     | National forest | Other federal | State   | County & municipal | Indian | Forest industry | Individual | Corporate |
| Softwoods            |           |                 |               |         |                    |        |                 |            |           |
| Jack pine            | 52,687    | 14,809          | 1,138         | 25,283  | 1,412              | -      | 361             | 6,686      | 2,998     |
| Red pine             | 327,633   | 109,604         | 740           | 93,804  | 6,722              | -      | 3,463           | 94,008     | 19,292    |
| White pine           | 181,389   | 26,182          | 594           | 42,614  | 2,251              | -      | 9,532           | 76,271     | 23,945    |
| White spruce         | 115,469   | 17,709          | 662           | 18,941  | 1,453              | 104    | 15,339          | 40,882     | 20,379    |
| Black spruce         | 6,349     | -1,983          | 28            | 3,795   | 12                 | -      | 342             | 2,289      | 1,866     |
| Balsam fir           | 62,869    | 7,922           | 382           | 10,969  | 554                | 24     | 6,741           | 28,828     | 7,449     |
| Hemlock              | 72,106    | 10,719          | 140           | 7,538   | 1,281              | 164    | 15,428          | 22,925     | 13,911    |
| Tamarack             | 20,237    | 1,618           | -             | 4,493   | 345                | -      | 2,772           | 8,476      | 2,533     |
| Eastern redcedar     | 427       | -               | -             | -       | -                  | -      | -               | 427        | -         |
| Northern white-cedar | 153,686   | 18,088          | 79            | 39,400  | 2,070              | 65     | 18,974          | 57,632     | 17,378    |
| Other softwoods      | 22,571    | 236             | -             | 285     | 316                | -      | -               | 20,349     | 1,385     |
| Total softwoods      | 1,015,423 | 204,904         | 3,763         | 247,122 | 16,416             | 357    | 72,952          | 358,773    | 111,136   |
| Hardwoods            |           |                 |               |         |                    |        |                 |            |           |
| Select white oak     | 89,497    | 9,244           | -             | 12,213  | 2,564              | -      | 645             | 58,230     | 6,601     |
| Select red oak       | 213,898   | 20,683          | 562           | 44,661  | 3,034              | -      | 3,301           | 120,427    | 21,230    |
| Other red oak        | 45,993    | 9,999           | 250           | 5,227   | 869                | -      | -               | 26,465     | 3,183     |
| Select hickory       | 8,593     | -               | -             | 273     | 1,342              | -      | -               | 6,239      | 739       |
| Other hickory        | 6,007     | -               | -             | 663     | 259                | -      | -               | 4,780      | 305       |
| Basswood             | 87,619    | 10,171          | -             | 17,371  | 1,072              | 129    | 5,916           | 42,620     | 10,340    |
| Beech                | 60,033    | 6,242           | 486           | 7,907   | 899                | -      | 5,635           | 30,186     | 8,678     |
| Yellow birch         | 14,026    | 1,767           | 163           | 1,555   | 484                | -1     | 2,261           | 4,597      | 3,200     |
| Hard maple           | 372,909   | 42,641          | 272           | 45,270  | 4,737              | 459    | 61,079          | 164,545    | 53,906    |
| Soft maple           | 350,782   | 37,007          | 332           | 49,849  | 4,483              | 343    | 26,671          | 192,763    | 39,334    |
| Elm                  | 37,818    | -111            | 1             | 3,913   | 27                 | 139    | -213            | 33,580     | 482       |
| Black ash            | 15,726    | 2,337           | -             | 1,732   | 463                | 2      | 1,386           | 7,629      | 2,177     |
| White & green ash    | 130,183   | 5,137           | 47            | 10,103  | 1,924              | -      | 2,612           | 97,108     | 13,252    |
| Sycamore             | 3,090     | -               | -             | -       | -                  | -      | -               | 3,055      | 35        |
| Cottonwood           | 22,944    | -               | -             | 915     | 482                | -      | -               | 18,591     | 2,956     |
| Willow               | 3,990     | -               | -             | 678     | 74                 | -      | -               | 3,049      | 189       |
| Hackberry            | 186       | -               | -             | -       | -                  | -      | -               | 186        | -         |
| Balsam poplar        | 36,757    | 1,378           | -             | 6,690   | 18                 | 21     | 1,581           | 24,059     | 3,010     |
| Bigtooth aspen       | 178,591   | 10,510          | 517           | 37,651  | 2,712              | 59     | 1,442           | 105,037    | 20,663    |
| Quaking aspen        | 252,072   | 23,195          | 2,178         | 46,912  | 2,038              | 601    | 13,979          | 132,166    | 31,003    |
| Paper birch          | 52,702    | 2,653           | 307           | 13,564  | 357                | 196    | 3,443           | 23,294     | 8,888     |
| Tupelo               | 623       | -               | -             | 59      | -                  | -      | -               | 564        | -         |
| Black cherry         | 53,707    | 5,711           | 323           | 5,545   | 998                | -      | 1,851           | 31,188     | 8,091     |
| Black walnut         | 6,270     | -               | -             | 261     | 554                | -      | -               | 5,242      | 213       |
| Butternut            | 1,901     | 17              | -             | -       | -                  | -      | -               | 1,800      | 84        |
| Yellow-poplar        | 4,855     | -               | -             | 229     | 48                 | -      | -               | 4,540      | 38        |
| Sassafras            | 4,760     | -               | -             | 258     | -                  | -      | -               | 4,392      | 110       |
| Other hardwoods      | 4,084     | -               | 1             | -       | 304                | -      | -               | 3,779      | -         |
| Total hardwoods      | 2,059,616 | 188,581         | 5,439         | 313,499 | 29,742             | 1,948  | 131,589         | 1,150,111  | 238,707   |
| All species          | 3,075,039 | 393,485         | 9,202         | 560,621 | 46,158             | 2,305  | 204,541         | 1,508,884  | 349,843   |

<sup>1</sup>International 1/4-inch rule.

Table 82. -- Current net annual growth of growing stock on timberland by species group and forest type, Michigan, 1992

(In thousand cubic feet)

| Species group        | All types | Forest type |          |            |            |              |              |                      |          |             |                    |                   |         |        | Paper birch | Balsam poplar | Non-stocked |
|----------------------|-----------|-------------|----------|------------|------------|--------------|--------------|----------------------|----------|-------------|--------------------|-------------------|---------|--------|-------------|---------------|-------------|
|                      |           | Jack pine   | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-beech-birch | Aspen   |        |             |               |             |
| Softwoods            |           |             |          |            |            |              |              |                      |          |             |                    |                   |         |        |             |               |             |
| Jack pine            | 10,995    | 9,272       | -246     | -43        | 46         | 48           | 329          | 3                    | 25       | 601         | 31                 | 397               | 515     | -2     | -           | 19            |             |
| Red pine             | 82,601    | 4,199       | 65,550   | 1,003      | 362        | 206          | 393          | 75                   | 6        | 2,846       | 295                | 3,434             | 3,729   | 463    | 9           | 31            |             |
| White pine           | 37,266    | 1,200       | 3,213    | 9,980      | 1,308      | 381          | 1,018        | 1,363                | 122      | 3,460       | 840                | 10,164            | 3,617   | 566    | 34          | -             |             |
| White spruce         | 26,045    | 369         | 704      | 551        | 3,950      | 5,922        | 848          | 248                  | 70       | 340         | 915                | 5,785             | 5,510   | 532    | 290         | 11            |             |
| Black spruce         | 3,604     | 249         | 65       | -90        | 696        | 76           | 3,401        | -1,884               | 287      | -           | 68                 | 225               | 527     | -23    | 7           | -             |             |
| Balsam fir           | 18,031    | 180         | 81       | 42         | 5,051      | 319          | 374          | -1,291               | 217      | 152         | 1,564              | 4,055             | 5,669   | 886    | 732         | -             |             |
| Hemlock              | 12,964    | -           | 41       | 60         | 127        | 4            | 44           | 538                  | -        | 106         | 633                | 10,929            | 329     | 137    | 16          | -             |             |
| Tamarack             | 4,933     | 21          | 14       | 12         | 315        | 31           | 1,119        | 404                  | 2,212    | 7           | 310                | 139               | 228     | 52     | 69          | -             |             |
| Eastern redcedar     | 275       | -           | -        | -          | -          | -            | -            | -                    | -        | 125         | -                  | 150               | -       | -      | -           | -             |             |
| Northern white-cedar | 45,076    | 12          | 79       | 102        | 1,978      | 231          | 823          | 30,385               | 547      | 48          | 3,210              | 3,796             | 2,266   | 1,043  | 556         | -             |             |
| Other softwoods      | 7,226     | 5,012       | 399      | 121        | 53         | 112          | 6            | 40                   | -        | 222         | 62                 | 1,091             | 93      | 15     | -           | -             |             |
| Total softwoods      | 249,016   | 20,514      | 69,900   | 11,738     | 13,886     | 7,330        | 8,355        | 29,881               | 3,486    | 7,907       | 7,928              | 40,165            | 22,483  | 3,669  | 1,713       | 61            |             |
| Hardwoods            |           |             |          |            |            |              |              |                      |          |             |                    |                   |         |        |             |               |             |
| Select white oak     | 20,886    | 111         | 358      | 178        | -          | -            | -            | 4                    | 1        | 15,260      | 1,153              | 3,268             | 515     | 38     | -           | -             |             |
| Other white oak      | 25        | -           | -        | -          | -          | -            | -            | -                    | -        | -           | 25                 | -                 | -       | -      | -           | -             |             |
| Select red oak       | 43,554    | 722         | 693      | 358        | 58         | 29           | -            | 41                   | 5        | 27,094      | 729                | 9,292             | 4,342   | 179    | 12          | -             |             |
| Other red oak        | 10,039    | 351         | 337      | 9          | -          | -            | -            | -                    | -        | 7,092       | 393                | 1,423             | 386     | -      | 48          | -             |             |
| Select hickory       | 2,075     | 9           | -        | -          | -          | -            | -            | -                    | -        | 1,194       | 55                 | 812               | 5       | -      | -           | -             |             |
| Other hickory        | 1,625     | 34          | -2       | -          | -          | -            | -            | -                    | -        | 777         | 37                 | 779               | -       | -      | -           | -             |             |
| Basswood             | 19,923    | 52          | 19       | 9          | 44         | 1            | -            | 28                   | -        | 541         | 984                | 17,476            | 674     | 92     | 3           | -             |             |
| Beech                | 14,117    | -           | 5        | 2          | 17         | -            | -            | -                    | -        | 319         | 98                 | 13,409            | 267     | -      | -           | -             |             |
| Yellow birch         | 4,231     | 2           | -        | 13         | 49         | -1           | 6            | 93                   | -        | 28          | 224                | 3,553             | 237     | 26     | 1           | -             |             |
| Hard maple           | 117,018   | 88          | 293      | 198        | 387        | 95           | 22           | 212                  | -        | 748         | 1,009              | 109,959           | 3,425   | 470    | 112         | -             |             |
| Soft maple           | 114,759   | 284         | 934      | 463        | 1,530      | 276          | 257          | 1,301                | 72       | 10,050      | 24,012             | 61,752            | 12,299  | 1,428  | 101         | -             |             |
| Elm                  | 17,159    | -2          | 34       | -          | 36         | -11          | -            | 28                   | 83       | 1,056       | 6,290              | 9,065             | 478     | 25     | 77          | -             |             |
| Black ash            | 9,757     | -           | -        | 11         | 332        | 17           | 5            | 353                  | 4        | 125         | 6,005              | 2,008             | 656     | 38     | 203         | -             |             |
| White & green ash    | 38,385    | 21          | 48       | 5          | 34         | 8            | -            | 201                  | 72       | 1,829       | 10,713             | 23,775            | 1,515   | 124    | 40          | -             |             |
| Sycamore             | 569       | -           | -        | -          | -          | -            | -            | -                    | -        | 19          | 398                | 152               | -       | -      | -           | -             |             |
| Cottonwood           | 4,536     | 5           | -        | -          | -          | -            | -            | 7                    | -        | 221         | 2,928              | 1,251             | 110     | 10     | 4           | -             |             |
| Willow               | 1,191     | -           | 7        | -          | -          | 3            | -            | -                    | -        | 51          | 863                | 222               | 33      | 3      | 9           | -             |             |
| Hackberry            | 120       | -           | -        | -          | -          | -            | -            | -                    | -        | 21          | 47                 | 52                | -       | -      | -           | -             |             |
| Balsam poplar        | 7,885     | 140         | 30       | 7          | 353        | 67           | 81           | -162                 | 41       | 55          | 886                | 801               | 1,888   | 577    | 3,121       | -             |             |
| Bigtooth aspen       | 44,178    | 305         | 661      | 333        | 252        | 8            | 49           | 56                   | 5        | 4,869       | 1,015              | 9,054             | 27,107  | 390    | 74          | -             |             |
| Quaking aspen        | 67,327    | 551         | 769      | 340        | 2,244      | 979          | 957          | 71                   | 18       | 1,265       | 3,056              | 14,129            | 41,452  | 906    | 580         | 10            |             |
| Paper birch          | 14,053    | 43          | 87       | 155        | 1,265      | 357          | 209          | 196                  | 75       | 392         | 1,033              | 3,860             | 3,486   | 2,754  | 141         | -             |             |
| Tupelo               | 311       | -           | -        | -          | -          | -            | -            | -                    | -        | 80          | 172                | 34                | 14      | 11     | -           | -             |             |
| Black cherry         | 14,933    | 179         | 211      | 69         | 87         | 29           | 16           | 17                   | 11       | 1,846       | 788                | 10,337            | 1,251   | 80     | 12          | -             |             |
| Black walnut         | 1,570     | -           | 4        | -          | -          | -            | -            | -                    | -        | 706         | 35                 | 825               | -       | -      | -           | -             |             |
| Butternut            | 295       | -           | -        | -          | -          | -            | -            | 8                    | -        | 105         | 32                 | 150               | -       | -      | -           | -             |             |
| Yellow-poplar        | 1,086     | 11          | 4        | -          | -          | -            | -            | -                    | -        | 93          | 162                | 816               | -       | -      | -           | -             |             |
| Sassafras            | 2,477     | 70          | -        | -          | -          | -            | -            | -                    | -        | 536         | 53                 | 1,804             | 14      | -      | -           | -             |             |
| Other hardwoods      | 1,910     | -           | 56       | -          | 1          | -            | -            | -                    | -        | 302         | 654                | 839               | 45      | -      | 13          | -             |             |
| Total hardwoods      | 575,994   | 2,976       | 4,548    | 2,150      | 6,689      | 1,857        | 1,602        | 2,454                | 387      | 76,674      | 63,849             | 300,897           | 100,199 | 7,151  | 4,551       | 10            |             |
| All species          | 825,010   | 23,490      | 74,448   | 13,888     | 20,575     | 9,187        | 9,957        | 32,335               | 3,873    | 84,581      | 71,777             | 341,062           | 122,682 | 10,820 | 6,264       | 71            |             |

Table 63. -- Current net annual growth of sawtimber on timberland by species group and forest type, Michigan, 1992

(In thousand board feet)<sup>1</sup>

| Species group        | All types | Forest type |          |            |            |              |              |                      |          |             |                    |                   | Paper birch | Balsam poplar | Non-stocked |       |
|----------------------|-----------|-------------|----------|------------|------------|--------------|--------------|----------------------|----------|-------------|--------------------|-------------------|-------------|---------------|-------------|-------|
|                      |           | Jack pine   | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-beech-birch |             |               |             | Aspen |
| Softwoods            |           |             |          |            |            |              |              |                      |          |             |                    |                   |             |               |             |       |
| Jack pine            | 52,687    | 43,443      | 2,071    | 760        | 182        | 218          | 30           | -                    | 33       | 2,898       | 414                | 742               | 1,628       | 3             | -           | 265   |
| Red pine             | 327,633   | 17,285      | 255,587  | 5,297      | 2,641      | 273          | 1,955        | 363                  | 34       | 9,445       | 1,348              | 15,720            | 16,505      | 954           | 53          | 173   |
| White pine           | 181,389   | 5,903       | 16,378   | 48,771     | 7,026      | 2,322        | 5,573        | 7,604                | 1,041    | 12,165      | 5,007              | 49,465            | 16,567      | 3,403         | 164         | -     |
| White spruce         | 115,469   | 1,610       | 3,818    | 2,158      | 19,203     | 11,899       | 4,939        | 3,330                | 222      | 640         | 4,651              | 27,909            | 31,603      | 2,195         | 1,292       | -     |
| Black spruce         | 6,349     | -22         | 234      | -54        | 2,287      | 1,042        | 5,066        | -4,719               | 99       | -           | 476                | 511               | 1,333       | 8             | 88          | -     |
| Balsam fir           | 62,869    | 128         | 350      | 289        | 14,827     | 686          | 1,443        | -2,662               | 433      | 312         | 5,055              | 14,341            | 20,676      | 4,058         | 2,933       | -     |
| Hemlock              | 72,106    | -           | 209      | 229        | 500        | 26           | 310          | 2,043                | -        | 312         | 2,970              | 62,774            | 1,440       | 1,130         | 163         | -     |
| Tamarack             | 20,237    | 36          | 81       | 17         | 1,841      | 95           | 3,967        | 1,854                | 9,034    | -           | 940                | 1,063             | 689         | 184           | 436         | -     |
| Eastern redcedar     | 427       | -           | -        | -          | -          | -            | -            | -                    | -        | 358         | -                  | 69                | -           | -             | -           | -     |
| Northern white-cedar | 153,686   | 17          | 237      | 879        | 6,289      | 811          | 1,972        | 94,424               | 838      | 71          | 12,336             | 20,603            | 9,119       | 2,953         | 3,137       | -     |
| Other softwoods      | 22,571    | 13,165      | 1,696    | 107        | 635        | 739          | -            | -                    | -        | 738         | 166                | 4,700             | 551         | 74            | -           | -     |
| Total softwoods      | 1,015,423 | 81,565      | 280,661  | 98,453     | 55,431     | 18,111       | 25,255       | 102,237              | 11,734   | 26,939      | 33,363             | 197,897           | 100,111     | 14,962        | 8,266       | 438   |
| Hardwoods            |           |             |          |            |            |              |              |                      |          |             |                    |                   |             |               |             |       |
| Select white oak     | 89,497    | 280         | 961      | 700        | -          | -            | -            | -                    | -        | 65,642      | 5,979              | 13,940            | 1,851       | 144           | -           | -     |
| Select red oak       | 213,898   | 2,780       | 3,878    | 1,780      | 135        | 18           | -            | -                    | 29       | 140,428     | 2,720              | 43,517            | 17,588      | 958           | 67          | -     |
| Other red oak        | 45,993    | 1,712       | 1,479    | 233        | -          | -            | -            | -                    | -        | 33,000      | 1,899              | 6,073             | 1,400       | -             | 197         | -     |
| Select hickory       | 8,593     | -           | -        | -          | -          | -            | -            | -                    | -        | 5,502       | 144                | 2,947             | -           | -             | -           | -     |
| Other hickory        | 6,007     | 167         | -        | -          | -          | -            | -            | -                    | -        | 2,545       | 94                 | 3,201             | -           | -             | -           | -     |
| Basswood             | 87,619    | 113         | 41       | 19         | 144        | 5            | -            | 175                  | -        | 971         | 2,989              | 80,320            | 2,702       | 140           | -           | -     |
| Beech                | 60,033    | -           | 32       | -          | 41         | -            | -            | -                    | -        | 1,410       | 544                | 57,144            | 862         | -             | -           | -     |
| Yellow birch         | 14,026    | 10          | -        | -3         | 388        | -1           | -            | 518                  | 3        | 50          | 454                | 12,164            | 438         | -1            | 6           | -     |
| Hard maple           | 372,909   | 95          | 328      | 731        | 637        | 147          | -            | 975                  | -        | 3,097       | 1,808              | 358,214           | 5,429       | 1,400         | 48          | -     |
| Soft maple           | 350,782   | 237         | 1,766    | 1,203      | 3,758      | 531          | 280          | 7,544                | 42       | 23,755      | 79,560             | 202,374           | 26,034      | 3,254         | 444         | -     |
| Elm                  | 37,818    | 1           | -        | -          | -44        | -37          | -            | 47                   | 19       | 2,724       | 13,778             | 19,993            | 1,036       | 309           | -8          | -     |
| Black ash            | 15,726    | -           | -        | 38         | 453        | -            | -            | 75                   | -        | 52          | 9,608              | 4,743             | 641         | 39            | 77          | -     |
| White & green ash    | 130,183   | 110         | 129      | 10         | -          | 13           | -            | 764                  | -        | 6,628       | 29,988             | 88,401            | 3,808       | 274           | 58          | -     |
| Sycamore             | 3,090     | -           | -        | -          | -          | -            | -            | -                    | -        | 108         | 2,317              | 665               | -           | -             | -           | -     |
| Cottonwood           | 22,944    | 24          | -        | -          | -          | -            | -            | 41                   | -        | 1,273       | 14,561             | 6,131             | 893         | -             | 21          | -     |
| Willow               | 3,990     | -           | -        | -          | -          | 14           | -            | -                    | -        | 36          | 3,126              | 761               | 35          | 18            | -           | -     |
| Hackberry            | 186       | -           | -        | -          | -          | -            | -            | -                    | -        | -           | 146                | 40                | -           | -             | -           | -     |
| Balsam poplar        | 36,757    | 334         | 22       | 62         | 1,224      | 131          | 31           | 2,886                | 209      | 175         | 3,137              | 2,095             | 10,699      | 2,583         | 13,169      | -     |
| Bigtooth aspen       | 178,591   | 153         | 2,768    | 1,406      | 1,260      | 50           | 698          | 616                  | 25       | 26,290      | 4,616              | 31,779            | 106,680     | 2,180         | 70          | -     |
| Quaking aspen        | 252,072   | 2,327       | 4,072    | 1,832      | 8,002      | 3,283        | 1,006        | 944                  | 63       | 4,891       | 13,292             | 56,063            | 146,987     | 6,725         | 2,585       | -     |
| Paper birch          | 52,702    | 51          | 227      | 622        | 2,867      | 971          | 393          | 1,918                | 348      | 1,666       | 4,132              | 12,424            | 12,855      | 13,414        | 814         | -     |
| Tupelo               | 623       | -           | -        | -          | -          | -            | -            | -                    | -        | 389         | 175                | -                 | -           | 59            | -           | -     |
| Black cherry         | 53,707    | 871         | 90       | 5          | 814        | 209          | -            | 228                  | 23       | 7,523       | 1,663              | 39,683            | 2,506       | 18            | 74          | -     |
| Black walnut         | 6,270     | -           | 20       | -          | -          | -            | -            | -                    | -        | 2,225       | 122                | 3,903             | -           | -             | -           | -     |
| Butternut            | 1,901     | -           | -        | -          | -          | -            | -            | 43                   | -        | 190         | 65                 | 1,603             | -           | -             | -           | -     |
| Yellow-poplar        | 4,855     | 58          | -        | -          | -          | -            | -            | -                    | -        | 505         | 654                | 3,638             | -           | -             | -           | -     |
| Sassafras            | 4,760     | 174         | -        | -          | -          | -            | -            | -                    | -        | 1,801       | 436                | 2,309             | 40          | -             | -           | -     |
| Other hardwoods      | 4,084     | -           | -        | -          | -          | -            | -            | -                    | -        | 88          | 1,359              | 2,637             | -           | -             | -           | -     |
| Total hardwoods      | 2,059,616 | 9,497       | 15,813   | 8,638      | 19,679     | 5,334        | 2,408        | 16,774               | 761      | 332,964     | 199,366            | 1,056,762         | 342,484     | 31,514        | 17,622      | -     |
| All species          | 3,075,039 | 91,062      | 296,474  | 67,091     | 75,110     | 23,445       | 27,663       | 119,011              | 12,495   | 359,903     | 232,729            | 1,254,659         | 442,595     | 46,476        | 25,888      | 438   |

<sup>1</sup> International 1/4-inch rule.

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1996. **Michigan forest statistics, 1993**. Resour. Bull. NC-170. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 144 p.

The fifth inventory of Michigan's forests reports 36.4 million acres of land, of which 19.3 million acres are forested. This bulletin presents statistical highlights and contains detailed tables of forest area, as well as timber volume, growth, removals, mortality, and biomass.

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KEY WORDS: Forest area, timber volume, growth, removals, mortality.