ECONOMIC COMMISSION FOR EUROPE

FOOD AND AGRICULTURE ORGANIZATION

Timber Committee

European Forestry Commission

SEMINAR ON THE VALORIZATION OF SECONDARY-QUALITY TEMPERATE-ZONE HARDWOODS

Nancy, France, 23 - 26 November 1987

RESTRICTED

TIM/EFC/SEM.1/R.11

9 September 1987

ENGLISH ONLY

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# EASTERN U.S. SELECT EXPORT SPECIES HARDWOOD RESOURCES

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Transmitted by the Government of the United States of America

(Items 4 and 5 of the Provisional Agenda)

GE.87-41955

# EASTERN U.S. SELECT EXPORT SPECIES HARDWOOD RESOURCES

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SUMMARY

The United States has become a major player in the export side of the world marketplace for hardwood logs, lumber, and veneer. For the last 10 years, U.S. exports of these products have been growing, and the future looks bright. The major hardwood species demanded on the export market are the select red and white oaks, yellow birch, hard maple, black walnut, black cherry, and the ashes. We will refer to this group as the select export species. The select oaks make up about two-thirds of U.S. hardwood product exports. The other select species make up most of the remaining one-third of our hardwood exports.

Because U.S. hardwood exports are centered around this group of species and the domestic market for these species is strong, several questions arise that need answers if demanders are to be assured of continued adequate supplies of these species. For instance, if recent wood use trends continue, can the United States continue to supply the export market--can U.S. exports increase? Are U.S. resources being depleted? How much secondary-quality material will be produced in the future while generating the needed top-quality clear, or almost clear, export material?

To answer these questions, we will take a look at the estimated 1985 sawtimber volumes for the Eastern United States and for the Northern and Southern regions, and projections for 1990, 1995, and 2000. Next, we will look at the log grade distribution in U.S. commercial sawtimber resources and translate these data into estimates of top-, secondary-, and lower-grade lumber output.

The United States has become a major player in the export side of the world marketplace for hardwood logs, lumber, and veneer. For the last 10 years, U.S. exports of these products have been growing, and the future looks bright. The increased exports have generated many questions on our ability to continue to supply our export and domestic markets. The questions have addressed sawtimber quantities, qualities, and whether we are using more of the major hardwood export species than we are growing each year.

The major hardwood species highly demanded on the export market are the select red and white oaks, yellow birch, hard maple, black walnut, black cherry, and the ashes. We will refer to this group as the select export species. The select oaks make up about two-thirds of U.S. hardwood product exports. The other select export species make up most of the remaining one-third of U.S. hardwood exports. A complete presentation on U.S. hardwood log, lumber, and veneer exports by species and major customers was reported by Araman and Hansen (1987).

Because U.S. hardwood exports are centered around this group of species and the domestic market for these species is strong, several questions arise that need answers if demanders are to be assured of continued adequate supplies of these species. For instance, if recent wood use trends continue, can the United States continue to supply the export market--can U.S. exports increase? Are U.S. resources being depleted? How much secondary-quality material will be produced in the future while generating the needed top-quality clear, or almost clear, export material? (The words quality and grade are synonymous in this paper.)

To answer these questions, we will take a look at the estimated 1985 sawtimber volumes for the Eastern United States and for the Northern and Southern regions (Figure 1), and projections for 1990, 1995, and 2000. Next, we will look at the log grade distribution in U.S. commercial sawtimber resources and translate these data into estimates of top-, secondary-, and lower-grade lumber output.

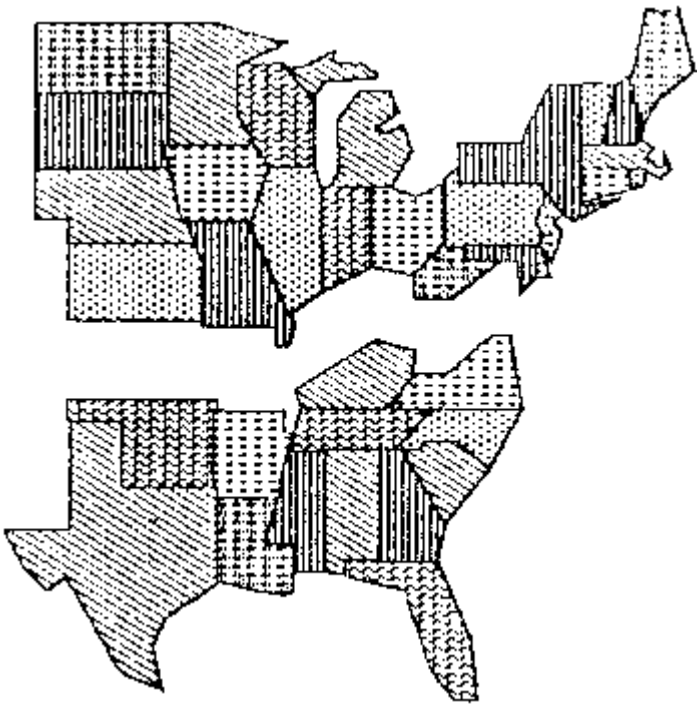

Figure 1.--Eastern United States and the Southern and the Northern regions.

## SAWTIMBER QUANTITIES

The base resource data used in this paper were compiled from U.S. Forest Service state resource evaluation reports. Data were compiled on all hardwood sawtimber and on the group of species previously defined as select export species. Survey years for the state resource reports ranged from 1975 to 1986 for the South and 1972 to 1987 for the North. Some data were collected directly from the Experiment Station inventory analysis units for recently resurveyed states or from recent inventory updates.

For each state, hardwood sawtimber inventory, growth, removals, and quality data were collected for the reported survey year. The inventory, growth, and removals data were then used to determine, by state, the current percent compound annual inventory changes for each of the select export species, the combined select export species, and all commercial hardwoods. Based on the compound annual rate of inventory change, the inventory data for each state were adjusted to 1985. The state data were then combined to generate the Eastern and then the Southern and Northern regional data shown in Table 1.

Table 1.--Estimated Eastern sawtimber volumes for 1985 and percent compound annual inventory changes, million cubic meters (International 1/4-inch rule).

| Saw-timber volumes | All commercial hardwoods | All select hardwoods | Select oaks | Hard maple | Ash, walnut, cherry | Yellow birch |
|---|---|---|---|---|---|---|
| | | | Eastern United States | | | |
| 1985 est. | 1718 | 550 | 323 | 102 | 104 | 21 |
| % change | 2.2 | 2.4 | 1.8 | 3.2 | 3.0 | 1.5 |
| | | | Northern States | | | |
| 1985 est. | 804 | 360 | 169 | 95 | 76 | 20 |
| % change | 2.2 | 2.4 | 1.4 | 3.2 | 3.3 | 1.5 |
| | | | Southern States | | | |
| 1985 est. | 914 | 190 | 154 | 7 | 28 | .5 |
| % change | 2.2 | 2.3 | 2.3 | 3.3 | 2.3 | 2.3 |

The Eastern results show that 32 percent, or 550 million cubic meters (International l/4-inch rule), of the 1985 estimated sawtimber inventories are in the select export sawtimber species demanded on the export market. Of that total, 59 percent are select oaks; 18 percent hard maple; 19 percent ashes, walnut and cherry; and 4 percent yellow birch. This review also revealed that the select export species are increasing slightly faster than all commercial hardwood sawtimber inventories (2.4 vs 2.2 percent). The hard maple and the combined ash, walnut, and cherry resources also are increasing much faster than the select oaks and yellow birch inventories.

On a regional basis, the 1985 estimates show that the South has 14 percent more commercial hardwood sawtimber than the North and that the annual rates of change are the same (2.2 percent). However, when considering only the select export species, the North has 89 percent more sawtimber than the South, and the North’s annual change is slightly higher (2.4 vs 2.3 percent). The annual changes are higher for the South except for the combined ash, walnut, and cherry species. The volume of select oak resources in the South is close to the North's, but the North has far greater quantities of the other select export species.

Using the 1985 estimates, the percent annual inventory changes, and assuming the continuation of past resource-use trends, we estimated sawtimber volumes for 1990, 1995, and 2000 (Table 2). The projections show positive inventory growth for the Eastern United States and In both regions for all categories. By the year 2000, 33 percent of the Eastern sawtimber could be in the select export species--up slightly from 1985. By 2000, 46 percent of the Northern sawtimber will be in the select export species versus 21 percent for the South. Further, by the year 2000, the Eastern select export species sawtimber resources may have increased by 42 percent (43 percent for the North and 41 percent for the South).

Results of individual species groupings show two trends. For the select oaks, the South has been achieving higher growth rates. For this reason, the quantities of select oak resources In the South should be the same as the North's in 1995 and exceed the North's beyond 1995. For all other select export species, the North will continue to have larger supplies. In 2000, the North will have approximately a 13 to 1 hard maple advantage; a 3 to 1 ash, walnut, and cherry advantage; and a 40 to 1 yellow birch advantage.

Table 2.--Estimated Eastern sawtimber volumes for 1985 with projections for 1990, 1995, and 2000, million cubic meters (International 1/4-inch rule).

| Year | All commercial hardwoods | All select hardwoods | Select oaks | Hard maple | Ash, walnut, cherry | Yellow birch |
|---|---|---|---|---|---|---|
| | | | Eastern United States | | | |
| 1985 | 1718 | 550 | 323 | 102 | 104 | 21 |
| 1990 | 1915 | 618 | 354 | 120 | 120 | 23 |
| 1995 | 2135 | 695 | 388 | 140 | 140 | 24 |
| 2000 | 2381 | 781 | 425 | 164 | 162 | 26 |
| | | | Northern States | | | |
| 1985 | 804 | 360 | 169 | 95 | 76 | 20 |
| 1990 | 896 | 405 | 181 | 111 | 89 | 22 |
| 1995 | 999 | 456 | 194 | 130 | 105 | 24 |
| 2000 | 1114 | 513 | 208 | 152 | 123 | 25 |
| | | | Southern States | | | |
| 1985 | 914 | 190 | 154 | 7 | 28 | .5 |
| 1990 | 1019 | 213 | 173 | 8 | 31 | .52 |
| 1995 | 1136 | 239 | 194 | 10 | 35 | .57 |
| 2000 | 1267 | 268 | 217 | 12 | 39 | .64 |

## SAWTIMBER QUALITIES

Two grading systems are used to present information on the quality of the Eastern United States standing sawtimber hardwood resources. The first is a log grading system described by Rast et al. (1979) that is used by U.S. Forest Service inventory analysts to define the quality of potential sawlogs in a standing tree. The second is a lumber grading system for hardwood lumber that was developed by the National Hardwood Lumber Association (1986 latest issue). In general, top grade FAS&Sel (Firsts-and-Seconds and Select) lumber is used for mouldings, millwork, export, and other market demanders of clear or almost clear lumber. Secondary-quality lumber, graded lC (No. 1 Common) and 2C (No. 2 Common) is used by dimension, furniture, cabinet, flooring, and other manufacturers. Material in the below 2C grade area is used as sleepers (ties), and mine timbers, or for the production of pallet parts and flooring.

Table 3.--Estimated quality of select export species sawtimber by log grade and potential output of sawn lumber by lumber grade.

| Species | Log grade | | | Lumber grade[a] | | | |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3&4 | FAS&Sel | 1C | 2C | Below 2C |
| | ----------percent---------- | | | | | | |
| **Eastern United States** | | | | | | | |
| All select hardwoods | 15 | 24 | 61 | 12 | 23 | 27 | 38 |
| Select oaks | 15 | 24 | 61 | 12 | 24 | 27 | 37 |
| Hard maple | 12 | 23 | 65 | 11 | 21 | 26 | 42 |
| Ash, walnut, cherry[b] | 15 | 25 | 60 | 19 | 25 | 29 | 27 |
| Yellow birch | 11 | 26 | 63 | 12 | 21 | 24 | 43 |
| **Northern States** | | | | | | | |
| All select hardwoods | 14 | 24 | 62 | 14 | 23 | 28 | 35 |
| Select oaks | 15 | 24 | 61 | 14 | 24 | 28 | 34 |
| Hard maple | 12 | 23 | 65 | 11 | 21 | 26 | 42 |
| Ash, walnut, cherry[c] | 13 | 24 | 63 | 19 | 25 | 29 | 27 |
| Yellow birch | 11 | 26 | 63 | 12 | 21 | 24 | 43 |
| **Southern States** | | | | | | | |
| All select hardwoods | 16 | 23 | 61 | 9 | 24 | 25 | 42 |
| Select oaks | 16 | 22 | 62 | 9 | 24 | 25 | 42 |
| Hard maple | 10 | 18 | 72 | 10 | 21 | 26 | 43 |
| Ash, walnut, cherry[d] | 19 | 27 | 54 | | | | |
| Yellow birch | 15 | 29 | 56 | 14 | 22 | 23 | 41 |

[a] Grade 4 not included, all logs grades 3&4 were considered as grade 3 in calculations.

[b] Lumber yields based on cherry yield tables from Northern statistics.

[c] Lumber yields based on cherry lumber yields.

[d] Data not available to compute lumber yields.

The base data used in this section were developed from the same U.S. Forest Service state resource reports used In the resource quantities section. By state, we gathered the sawtimber quality information expressed in quantity per log grade per species for the select export species. The state data were then combined to generate the Eastern, the Southern, and the Northern regional data shown in Table 3. Using yield tables developed by Hanks et. al. (l980), the log grade information was transformed into potential output of sawn lumber by

lumber grade. The lumber grade results assumed the production of lumber from the distribution of logs found in the woods. In actual practice, many of the small diameter, low-grade logs and many other larger, low-grade logs are never removed from the forests. Consequently, the quality of logs removed from the woods is actually better than what is found in the woods. This improves the distribution of sawn lumber produced over the numbers shown in Table 3.

The Eastern results show that 15 percent of the select export species are in log grade 1, 24 percent in log grade 2, and the remaining 61 percent in log grades 3 and 4. Overall, sawtimber quality was similar for both regions. However, among regions differences are apparent in the distribution of log grades for hard maple, yellow birch, and the combined ash, walnut, and cherry category.

Potential output of sawn lumber by lumber grade for the Eastern United States is 12 percent in top grade (FAS&Sel), 50 percent in the lC/2C grades, and 38 percent in the below 2C grades. The hard maple and yellow birch results are slightly lower and the combined ash, walnut, and cherry (based only on cherry yields) results are slightly higher than the overall percentages.

On a regional basis, the potential lumber grade production in the select export species from the Northern states is better in the top grades of lumber than from the Southern states; this result is reversed for the below 2C potential output. The lC/2C results are similar. These same observations also hold for the select oak resources for the two regions. Higher grade lumber yields by log grade for select oaks in the North creates this situation.

Generally, the markets for the top grade lumber (FAS&Sel) are the most profitable though output in these grades is limited. On the other end, sawmillers are satisfied to cover their costs In the sale of below 2C material. Therefore, the lC/2C lumber, which can account for about half of a sawmillers total production, must have adequate and profitable outlets if the sawmiller's overall profit picture is to be positive.

## CONCLUSIONS

The Eastern United States has substantial quantities of select export species, and these resources are increasing and not decreasing as some fear. By the year 2000, U.S. inventories of select export species sawtimber could increase by 42 percent to 781 million cubic meters (International l/4-inch rule). Thus, it would appear that the United States has the resources necessary to continue to supply domestic markets; to continue as a major player in the world hardwood market for log, lumber, and veneer products; and to increase exports of further processed hardwood products.

On a regional basis, the North has the most sawtimber in the select export species categories; and with present trends, the North will continue to lead in 1990, 1995, and 2000--primarily because the export market is demanding hardwood species that are predominate in the North. The major bright spot for the South is that its select oak inventories could equal the North's by 1995 and surpass the North's shortly after 1995 due to greater annual growth rates.

When considering the quality of the standing sawtimber and the potential output by lumber grade, about 50 percent of the output is secondary-quality (lC/2C) material, and 38 percent is below this quality level. The vitality of the markets for the secondary-quality material dictates the overall economic performance of a sawmill and, therefore, is very important. Improvements in present and potential markets and development of new uses for this quality range of material, such as value-added export dimension, need to be constant goals.

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