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HARDWOOD LOG GRADES and Lumber Grade Yields for Factory Lumber Logs



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Abstract

The USDA Forest Service Standard Grades for Hardwood Factory Lumber Logs are described, and lumber grade yields for 16 species and 2 species groups are presented by log grade and log diameter. The grades enable foresters, log buyers, and log sellers to select and grade those logs suitable for conversion into standard factory grade lumber. By using the appropriate lumber grade yields, log buyers and sellers can appraise the logs in terms of expected lumber grade volume and value. This report supersedes an earlier report on hardwood log grading, Forest Service Research Paper FPL 63.

INTRODUCTION

SAWMILL OPERATORS learned long ago that small, knotty logs are less valuable than large, clear ones. Hardwood sawlog grading systems were first developed in the early 1900's to assist buyers and sellers when logs were being appraised. Through the years, the supply of high-quality timber has decreased while demand and price have increased. Thus, the significance of evaluating quality during the production, harvesting, and processing of sawlogs has never been more important. Log grades are a tool that can help maximize the potential yield of high-value products from the timber resource.

BACKGROUND

The hardwood log grade specifications presented here were originally published in 1949 by the USDA Forest Service's Forest Products Laboratory. This system enables foresters, timber sellers, and timber buyers to separate, from woods-run hardwood logs, those logs that are suitable for manufacture into factory grade lumber, and to rank the logs into categories of high-, medium-, and low-quality yields. In 1952 the grades were adopted as the official hardwood log grades for use by the Forest Service. Lumber grade yields accompanied the earlier report that was revised in 1966 (Vaughan et al. 1966). The yields are tabulated by species, log grade, and diameter class and represent the percentage of total lumber tally for each class that was assigned to the National Hardwood Lumber Association's (NHLA) lumber grades. Additional information on lumber grade yield has been collected in recent years and is combined with the previously reported yields. Yields for 16 individual species and two groups of lowland oak species are presented. These yields, when coupled with lumber prices, provide a means for estimating the value of lumber that can be sawed from graded logs.

LOG GRADE SPECIFICATIONS

A log grading system can be defined as a set of specifications that is used to segregate a given lot of cut logs into two or more log grades.¹ To that definition has been added the requirement that there be significant differences in unit value or in end product yield between the log grades.

During the development of the hardwood log grade specifications, many of the variables studied were discarded because they were not reliable in segregating logs into distinct groups. The following are the variables that were included in the specifications.

Log diameter

Log diameter inside bark (dib) at the small end is the single most important variable related to lumber grade yield and log value. The lumber grade yields in this paper are tabulated by log grade and scaling diameter so that diameter functions as a continuous grading factor within the log grades.

Large logs are more valuable than small logs because they contain more lumber, and the lumber often is worth more per board foot. Large logs typically contain more defect-free wood than small logs, so more high-grade lumber is produced. This is a result of natural pruning followed by clear wood being laid down over the central core of knots. Large logs also result in the production of wider boards; and as board width increases, lumber grade also increases.

Log length

Log length is a grading factor for grade 1 logs. A minimum length of 10 feet is imposed, whereas grade 2 and 3 logs may be as short as 8 feet. Loggers who sell graded logs should buck high-quality logs into

¹Newport, Carl A., C.R. Lockard, and C.L. Vaughn. 1958. Log and tree grading as a means of measuring quality. USDA Forest Service report of the National Log Grade committee. 31 p.

lengths of 10 feet or more. The 10-foot minimum length for grade 1 logs relates to length specifications found in the NHLA rules for grading hardwood lumber. The NHLA rules limit the proportion of short lumber permitted in a shipment of the better grades.

Log position

Whether a log is a butt or an upper log is a grading factor for grade 1 logs. Both types of logs are permitted in grade 1. However, butt logs may be as small as 13 inches dib, whereas upper logs must scale at least 16 inches dib.

Clear cuttings

As part of the grading procedure, the log's surface is visually divided into four equal faces. High-quality sawlogs are characterized by faces with long, defect-free areas called clear cuttings. Sawlogs of low quality have shorter clear cuttings. The rules related to clear cuttings (Fig. 1) were derived from NHLA rules for grading lumber, and the similarity is obvious when comparisons are made. The number and length of clear cuttings and the proportion of a board that is clear are considered when grading a board. The faces of a log are graded much like a board, so these same items are considered for each face.

Figure 1.—Forest Service Standard Grades for Hardwood Factory Lumber Logs.^a

Grading factors		Log grades							
		F1			F2			F3	
Position in tree		Butt only	Butts & uppers		Butts & uppers			Butts & uppers	
Scaling diameter, inches		13-15 ^b	16-19	20+	11+ ^c	12+		8+	
Length without trim, feet		10+			10+	8-9	10-11	12+	8+
Required clear cuttings ^d on each of 3 best faces ^e	Min. length, feet	7	5	3	3	3	3	3	2
	Max. number	2	2	2	2	2	2	3	No limit
	Min. proportion of log length required in clear cutting	5/6	5/6	5/6	2/3	3/4	2/3	2/3	1/2
Maximum sweep & crook allowance	For logs with less than 1/4 of end in sound defects	15%			30%			50%	
	For logs with more than 1/4 of end in sound defects	10%			20%			35%	
Maximum scaling deduction		40% ^f			50% ^g			50%	
End defect:		See special instructions (page 18)							

^a From Rast et al. 1979, revised.

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

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

^d A clear cutting is a portion of a face, extending the width of the face, that is free of defects.

^e A face is 1/4 of the surface of the log as divided lengthwise.

^f Otherwise #1 logs with 41-60% deductions can be #2.

^g Otherwise #2 logs with 51-60% deductions can be #3.

Some of the defects that limit clear cuttings include limbs, overgrown knots, bumps, holes, and bird pecks. These are discussed in detail in "A Guide to Hardwood Log Grading" (Rast et al. 1979). Seams that extend from the surface to a depth less than one-fifth the diameter of the log at that point are not considered defects.

Sweep and crook

The volume lost due to sweep and crook is estimated when scaling a sawlog. Excess curvature results in a decrease of both lumber volume and lumber grade yield. See Rast et al. (1979) for a discussion of how to estimate percent deduction due to sweep and crook. Because sweep and crook affect lumber grade yield as well as lumber volume, the estimated percent deduction is a grading factor.

Scalable defect

Scalable defects include rot and shake as well as sweep and crook. The total deduction is limited in low-quality logs because minimum requirements must be present for a log to qualify as a factory lumber log. The amount of scalable defect is limited in high-quality logs because the overall quality of lumber is reduced in logs with large proportions of these defects.

Sound end defect

Sound end defects include gum spots, bird pecks, bark pockets, and stain. For a complete discussion of these defects, see Rast et al. (1979) and Lockard et al. (1963). The overall frequency of these defects is low, but isolated occurrences may be intense, resulting in significant damage to the potentially high-grade lumber. It is necessary to be alert for such defects because their oversight may be critical.

PROCEDURE

Data used in this study were collected over a period of 40 years. Much of the original work was carried out under the direction of the Forest Products Laboratory. In recent

years, the work has been under the direction of the Northeastern Forest Experiment Station. However, the procedures have remained consistent through the years.

Log selection, diagraming, and scaling

During the first 20 years of the study, the logs were selected at mill yards. Since 1959, it has been possible to reference the log to the tree. Each log's surface and end characteristics were diagramed to provide a photolike description of the type and size of all abnormalities that could be identified.

Each log was scaled using both the International 1/4-inch and Scribner Decimal C log rules.

Sawing and lumber grading

The nearly 20,000 logs were sawed at more than 75 sawmills throughout the Eastern United States. As each log was sawed, the resulting boards were numbered so that all lumber could be referenced to the log from which it was sawed.

Each board was graded shortly after sawing, and a tally was maintained that included log number, board thickness, surface measure, and grade. For logs sawed since 1959, all boards were regraded and measured after air drying.

Log grading and log yields

The log diagrams were graded by specifications of the Forest Service Standard Grades for Hardwood Factory Lumber Logs (Fig. 1).

The lumber tally data were processed by log so that total lumber tally could be partitioned by lumber grade and thickness class. Much of the green yield data collected before 1959 were converted to dry yields by conversion factors developed by Gammon (1971).

Lumber grade yields

For each species and log grade, we determined the percentage lumber grade yields by diameter class. Lumber grade yields for the following 12 species represent dry yields (Tables 1-36). Species included are:

basswood	black oak
paper birch	chestnut oak
yellow birch	northern red oak
black cherry	scarlet oak
red maple	white oak
sugar maple	yellow-poplar

Green yields are presented for beech, cottonwood, elm, sap gum, lowland white oak, and lowland red oak (Tables 37-54). Green to air-dry conversion factors were not available for these species.

The yields for all diameters are shown in the bottom row of each yield table. These averages should not be used for a specific group of graded logs unless the diameter distribution of the group closely matches that of the logs from the table.

To better use the lumber sawed from chestnut oak logs, the boards are often graded and sold under specifications combining the term "worm holes no defect" (WHND) with the names of standard grades such as Firsts and Seconds. We followed this procedure. If you wish to estimate the yields of lumber graded by the standard lumber grades, we suggest the following conversion from tabular grades to standard grades:

<i>Tabular Lumber Grade</i>	<i>Standard Lumber Grade</i>
FAS - WHND	1C
F1F - WHND	2C
SEL - WHND	2C
1C - WHND	2C

The lumber thickness distributions by species and log grade are presented along with the yield tables. Use of the thickness distributions when determining log value is discussed below.

Overruns

Overrun is the percentage difference between net log scale and lumber tally. Overrun values for both the International 1/4-inch and Scribner Decimal C log rules accompany the lumber grade yields (Tables 1-54).

APPLICATION OF THE GRADES AND YIELDS

The factors considered in log grading discussed earlier include log size, position, surface defects, straightness, and soundness. When grading logs, you should develop a system that includes these factors. We suggest the following:

- Measure scaling diameter to the nearest inch.
- Measure log length to the last whole foot.
- Determine whether the log is a butt or an upper log.
- Establish the location of all defect indicators—"stoppers"—on the log's surface and ends.
- Locate the clear cuttings and the grading face.
- Measure sweep and crook and estimate scalable defect.
- Determine the log's grade.

Because a log's grade is equal to the grade of the third best face, it is often advantageous to position the faces so that one face is of lower grade than the others.

The technique of log grading cannot be perfected without actual field instruction and practice. Visits to local sawmills and logging jobs will prove invaluable in becoming acquainted with surface and end defects and how they affect lumber grade. Instruction in log grading is offered by the USDA Forest Service, State and Private Forestry, and by many states and forestry schools. If you are interested in learning how to grade hardwood logs, we encourage you to contact one of these agencies.

Bucking

Proper bucking will provide better lumber grade yields than poor bucking practices. If a sawmill operator purchases graded logs, log buckers will benefit by understanding and applying the grading rules. The same is true where the loggers are employed by the

sawmill. A complete discussion of bucking for grade is included in Petro (1971).

Allocation

The initial allocation of woods-run logs into the various log classes—veneer, construction, local use, pulp, and factory lumber—should be the decision of the bucker. As you have learned, factory lumber logs are divided into log grades 1, 2, and 3. Depending on markets and costs, an operator may choose to saw only certain grade 3 logs; or to sort out the veneer class logs from the grade 1 and 2 logs; or to process grade 1 and 2 logs at a mill different from that used to process grade 3 logs.

Timber cruising

The hardwood log grades have sometimes been applied to logs in standing trees. Problems often are encountered when estimating bucking points, inside-bark diameters, interior cull, and length of clear cuttings. These difficulties are compounded as graders attempt to grade the upper logs.

An alternative to grading logs in standing trees is available. In "Hardwood Tree Grades For Factory Lumber," Hanks (1976) described a system of tree grades requiring the grader to consider only the butt log. The butt log is graded by nearly the same specifications described in this paper, and this grade becomes the tree's grade. Included are yields for 11 species: yellow birch, paper birch, red maple, sugar maple, yellow-poplar, black cherry, basswood, northern red oak, black oak, scarlet oak, white oak, and chestnut oak. Yields for graded aspen trees are presented in "Lumber Grade Yields For Graded Aspen Logs and Trees" (Hanks and Brisbin 1978).

Log valuation

We stated earlier that log grades were developed to assist buyers and sellers when logs are appraised. In the following examples we demonstrate how the lumber grade yields, thickness distributions, and overruns can be used to predict the value of lumber that can be sawed from a log. We used lumber price quotations from the weekly Hardwood Market Report published by Abe Lemsky.

Species: Yellow Birch
Log grade: 1
Scaling diameter: 13 inches

Lumber grade	Predicted yield*	Lumber price	
		per thousand board feet	Lumber value
		----Dollars----	
		Percent	
FAS	16.8	415	69.72
F1F	9.2	405	37.26
SEL	4.6	395	18.17
1 C	29.7	290	86.13
2 C	15.7	185	29.04
3 A	7.5	160	12.00
3 B	16.5	135	22.28
Total			274.60

*See table 7.

This figure tells you that 1,000 board feet of 4/4-inch lumber from grade 1, 13 inch yellow birch logs are worth \$274.60. If you want to determine lumber value for the thickness distribution presented in table 7, a weighted price for each lumber grade can be calculated as indicated below for FAS:

Thickness class (inches)	Percent of volume	Lumber price per thousand board feet
Dollars		
3/4	1.1	410
4/4	71.3	415
5/4	12.4	420
6/4	5.6	425
8/4	5.5	440
10/4	4.1	450

FAS weighted price = \$418.94/M bf.

Weighted prices for all lumber grades could be calculated, and used to determine lumber value per M bf of grade 1, 13-inch yellow birch logs.

The next step is to estimate the lumber volume of the log being considered. A 13-inch, 16-foot log scales 115 board feet by the International 1/4-inch log rule. You may wish to adjust that estimate up or down if

you have reliable overrun figures. From Table 7 we see that an underrun of 1.3 percent was obtained after sawing 48 grade 1 logs that scaled 13 inches. If an underrun of 1.3 percent were subtracted from 115 board feet, a reduced volume of 114 board feet would result.

The last step towards estimating lumber value:

$$\text{lumber value} = \frac{\$274.60 \times 114 \text{ board feet}}{1,000 \text{ board feet}}$$

$$\text{lumber value} = \$31.30$$

This figure represents the estimated value of air-dry lumber that can be sawed from a 13-inch, 16-foot, grade 1 yellow birch log. To predict the value of the log at the mill or decked in the woods, subtract the costs of transporting and converting the log into air-dry lumber.

LITERATURE CITED

- Gammon, Glenn L.
1971. Volume loss and grade change of hardwood lumber during air-drying. USDA For. Serv. Res. Pap. NE-227. 17 p.
- Hanks, Leland F.
1976. Hardwood tree grades for factory lumber. USDA For. Serv. Res. Pap. NE-333. 81 p.
- Hanks, Leland F., and Robert L. Brisbin.
1978. Lumber grade yields for graded aspen logs and trees. USDA For. Serv. Res. Pap. NE-423. 13 p.
- Lockard, C. R., J. A. Putnam, and R. D. Carpenter.
1963. Grade defects in hardwood timber and logs. U.S. Dep. Agric., Agric. Hand. 244. 39 p.
- Petro, F. J.
1971. Felling and bucking hardwoods. How to improve your profit. Can. For. Serv., Dep. Fish. and For., Publ. 1291. 140 p.
- Rast, Everette D., David L. Sonderman, and Glenn L. Gammon.
1979. A guide to hardwood log grading. (Revised) USDA For. Serv. Gen. Tech. Rep. NE-1. 32 p.
- Vaughan, C. L., A. C. Wollin, K. A. McDonald, and E. H. Bulgrin.
1966. Hardwood log grades for standard lumber. USDA For. Serv. Res. Pap. FPL-63. 52 p.

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APPENDIX

Key to Symbols for Tables 1-54

No. logs—actual number of logs sampled

Scale

Int. 1/4-inch rule—International 1/4-inch log rule. Scribner Decimal C rule—Scribner Decimal C log rule. Overrun (Pct.)—lumber tally minus net scale divided by net scale.

NHLA lumber grade yields (actual)—actual lumber grade yields

(green or dry) in percent by National Hardwood Lumber Association lumber grades.

FAS — First and Seconds

F1F — Firsts and Seconds one face

Sel — Select

Saps — Saps, yellow-poplar only

1C — No. 1 Common

2C — No. 2 Common

2A — No. 2A Common

2B — No. 2B Common

SW — Sound wormy

3C — No. 3 Common

3A — No. 3A Common

3B — No. 3B Common

SSE — Sound square edge

TBR — Timbers

WHND — Worm Holes No Defect, chestnut oak only

Index for Lumber Grade Yield Tables

Table No.	Species	Log Grade	Page	Table No.	Species	Log Grade	Page
1	Basswood	1	10	33	White oak	3	60
2	Basswood	2	11	34	Yellow-poplar	1	62
3	Basswood	3	12	35	Yellow-poplar	2	64
4	Paper birch	1	13	36	Yellow-poplar	3	66
5	Paper birch	2	14	37	Beech (green)	1	68
6	Paper birch	3	15	38	Beech (green)	2	70
7	Yellow birch	1	16	39	Beech (green)	3	72
8	Yellow birch	2	18	40	Cottonwood (green)	1	73
9	Yellow birch	3	20	41	Cottonwood (green)	2	74
10	Black cherry	1	22	42	Cottonwood (green)	3	75
11	Black cherry	2	23	43	Elm (green)	1	76
12	Black cherry	3	24	44	Elm (green)	2	78
13	Red maple	1	26	45	Elm (green)	3	80
14	Red maple	2	28	46	Sap gum (green)	1	81
15	Red maple	3	30	47	Sap gum (green)	2	82
16	Sugar maple	1	32	48	Sap gum (green)	3	83
17	Sugar maple	2	34	49	Lowland red oak (green)	1	84
18	Sugar maple	3	36	50	Lowland red oak (green)	2	85
19	Black oak	1	38	51	Lowland red oak (green)	3	86
20	Black oak	2	40	52	Lowland white oak (green)	1	88
21	Black oak	3	42	53	Lowland white oak (green)	2	90
22	Chestnut oak	1	44	54	Lowland white oak (green)	3	92
23	Chestnut oak	2	46				
24	Chestnut oak	3	48				
25	Northern red oak	1	50				
26	Northern red oak	2	51				
27	Northern red oak	3	52				
28	Scarlet oak	1	54				
29	Scarlet oak	2	55				
30	Scarlet oak	3	56				
31	White oak	1	57				
32	White oak	2	58				

Table 1.—BASSWOOD: log grade 1: dry lumber grade yield, by scaling diameter

Scaling diameter (inches)	No. logs	Scale						Total lumber tally	NHLA lumber yields (actual)					
		Int. 1/4-inch rule			Scribner Decimal C rule				FAS	SEL	1C	2C	3C	
		Gross	Net	Over-run	Gross	Net	Over-run							
		<i>Board feet</i>		<i>Percent</i>		<i>Board feet</i>		<i>Percent</i>		<i>Board feet</i>				
12	36	2,935	2,751	-1.7	2,480	2,311	17.0	2,704	16.3	16.5	32.2	26.4	8.6	
13	40	3,990	3,830	-1.2	3,380	3,222	17.5	3,785	27.0	17.1	26.9	16.9	12.1	
14	26	3,070	2,890	-0.6	2,590	2,395	20.0	2,874	22.3	17.9	29.0	25.8	5.0	
15	28	3,785	3,628	-2.6	3,420	3,270	8.0	3,532	30.3	17.9	28.3	16.9	6.6	
16	32	4,545	4,253	-2.3	4,100	3,797	9.5	4,157	24.3	15.3	29.5	20.5	10.4	
17	21	3,790	3,564	3.1	3,400	3,133	17.3	3,674	33.3	17.1	23.7	14.0	11.9	
18	20	3,925	3,572	-2.2	3,640	3,218	8.6	3,494	35.8	17.5	16.6	19.7	10.4	
19	8	1,800	1,591	-4.4	1,680	1,434	6.1	1,521	43.0	10.5	22.9	12.3	11.3	
20	2	385	370	-24.3	380	365	-23.3	280	42.5	15.7	27.9	13.9	—	
21	2	390	344	-11.3	380	335	-9.0	305	24.6	11.1	24.3	31.8	8.2	
22	3	875	875	-14.9	830	830	-10.2	745	35.9	14.6	26.8	10.1	12.6	
23	3	1,040	977	-3.3	1,020	952	-0.7	945	25.2	25.3	17.2	16.0	16.3	
All diameters	221	30,530	28,645	-2.2	27,300	25,262	10.9	28,016	28.6	16.8	25.9	18.9	9.8	

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Percentage distribution of log grade 1 yields, by thickness

Lumber thickness (inches)	FAS	SEL	1C	2C	3C
1/2	—	—	—	0.1	—
5/8	—	—	—	0.5	—
3/4	5.5	1.6	4.4	4.0	5.8
4/4	61.8	69.6	67.1	71.4	58.3
5/4	15.4	7.1	14.6	12.0	5.9
6/4	2.3	7.6	3.2	0.5	0.4
7/4	—	—	—	0.5	—
8/4	15.0	13.9	10.6	7.2	5.5
9/4	—	0.2	0.1	3.8	23.7
12/4	—	—	—	—	0.4
Total tally (board feet)	8,016	4,703	7,258	5,297	2,742

Table 2.—BASSWOOD: log grade 2: dry lumber grade yield, by scaling diameter

Scaling diameter (inches)	No. logs	Scale						Total lumber tally	NHLA lumber grade yields (actual)				
		Int. 1/4-inch rule			Scribner Decimal C rule				FAS	SEL	1C	2C	4C
		Gross	Net	Over-run	Gross	Net	Over-run						
		--- Board feet ---	Percent	--- Board feet ---	Percent	Board feet	----- Percent -----						
10	57	2,965	2,797	-0.8	2,370	2,235	24.1	2,774	5.6	9.0	30.7	36.3	18.4
11	138	8,415	7,883	0.7	6,620	6,185	28.4	7,942	7.0	7.5	34.0	38.4	13.1
12	107	7,760	7,294	-1.0	6,640	6,211	16.2	7,219	7.6	9.6	32.0	36.5	14.3
13	88	7,715	7,112	-2.9	6,490	5,953	16.0	6,907	7.9	9.2	31.2	36.9	14.8
14	74	7,405	6,745	-3.6	6,460	5,771	12.6	6,501	11.0	11.1	31.9	33.1	12.9
15	54	6,345	5,707	-4.7	5,850	5,208	4.5	5,440	18.1	10.9	29.0	28.8	13.2
16	20	2,630	2,181	-8.4	2,390	1,965	1.6	1,997	10.9	11.4	32.6	28.9	16.2
17	8	1,210	1,040	-3.8	1,110	931	7.5	1,001	6.9	5.7	38.7	38.6	10.1
18	2	250	233	-2.6	240	219	3.7	227	--	21.1	27.3	28.3	23.3
19	4	800	602	-6.6	750	499	12.6	562	42.6	27.9	12.1	8.0	9.4
20	1	155	155	-27.1	160	160	-29.4	113	43.5	11.5	15.0	26.5	3.5
21	2	390	381	-16.8	380	367	-13.6	317	2.5	4.7	17.7	43.2	31.9
All diameters	555	46,040	42,130	-2.7	39,460	35,704	14.8	41,000	10.0	9.8	31.5	34.6	14.1

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Percentage distribution of log grade 2 yields, by thickness

Lumber thickness (inches)	FAS	SEL	1C	2C	3C
1/2	--	--	--	--	--
5/8	--	--	--	0.2	--
3/4	1.6	1.1	2.3	1.8	1.9
4/4	60.5	75.4	70.4	69.8	62.6
5/4	21.1	6.1	15.2	12.5	8.1
6/4	1.8	4.4	1.2	0.5	--
8/4	15.0	11.7	10.7	11.9	6.1
9/4	--	0.4	0.2	3.3	21.3
10/4	--	0.9	--	--	--
Total tally (board feet)	4,084	4,010	12,915	14,192	5,799

Table 3.—BASSWOOD: log grade 3: dry lumber grade yield, by scaling diameter

Scaling diameter (inches)	No. logs	Scale						Total lumber tally	NHLA lumber grade yields (actual)				
		Int. 1/4-inch rule			Scribner Decimal C rule				FAS	SEL	1C	2C	3C
		Gross	Net	Over-run	Gross	Net	Over-run						
		---Board feet---	Percent	---Board feet---	Percent	Board feetPercent.....						
8	93	2,270	2,173	10.5	1,700	1,626	47.7	2,402	0.1	0.5	13.3	59.0	27.1
9	176	5,995	5,657	5.1	5,100	4,809	23.6	5,946	1.5	3.0	23.4	53.9	18.2
10	150	6,560	6,116	2.8	5,370	4,997	25.8	6,287	1.2	3.1	20.6	57.5	17.6
11	64	3,500	3,230	-1.7	2,850	2,630	20.7	3,175	1.6	4.5	22.6	56.7	14.6
12	37	2,355	2,144	-1.1	2,040	1,824	16.2	2,120	1.1	4.8	17.3	56.1	20.7
13	25	1,835	1,659	-5.3	1,570	1,393	12.8	1,571	6.0	9.5	20.1	47.3	17.1
14	13	1,235	1,159	-0.8	1,080	1,001	14.9	1,150	6.4	10.0	23.7	40.0	19.9
15	14	1,735	1,599	-5.2	1,580	1,415	7.1	1,516	4.1	4.9	20.6	48.5	21.9
16	11	1,445	1,324	3.9	1,320	1,177	16.8	1,375	12.8	13.5	27.0	29.9	16.8
17	7	1,150	1,064	1.0	1,040	938	14.6	1,075	7.0	9.1	21.3	47.3	15.3
18	3	570	539	-11.7	530	490	-2.9	476	9.7	10.3	43.1	29.8	7.1
19	2	380	309	-5.5	360	277	5.4	292	39.4	12.0	2.1	34.2	12.3
All diameters	595	29,030	26,973	1.5	24,540	22,577	21.3	27,385	3.2	4.9	21.2	52.3	18.4

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Percentage distribution of log grade 3 yields, by thickness

Lumber thickness (inches)	FAS	SEL	1C	2C	3C
1/2	—	—	—	—	0.1
5/8	—	—	—	0.1	—
3/4	2.7	0.7	1.2	2.1	0.9
4/4	85.5	81.8	82.6	79.9	70.7
5/4	3.3	2.1	10.2	8.4	5.7
6/4	8.5	8.5	3.2	0.1	0.2
7/4	—	—	—	0.2	—
8/4	—	3.4	2.3	3.0	3.8
9/4	—	3.5	0.5	6.2	18.6
Total tally (board feet)	879	1,336	5,801	14,328	5,041

Table 4.—PAPER BIRCH: log grade 1: dry lumber grade yield, by scaling diameter

Scaling diameter (inches)	No. logs	Scale						Total lumber tally	NHLA lumber grade yields (actual)					
		Int. 1/4-inch rule			Scribner Decimal C rule				FAS	SEL	1C	2C	3A	3B
		Gross	Net	Over-run	Gross	Net	Over-run							
		--- Board feet ---		Percent	--- Board feet ---		Percent	Board feet	-----Percent-----					
13	10	1,045	1,027	-14.7	890	874	0.2	876	15.4	25.1	22.4	16.8	13.1	7.2
14	7	835	749	-10.4	710	621	8.1	671	26.4	29.6	14.2	14.5	12.8	2.5
15	10	1,285	1,165	-9.6	1,170	1,034	1.8	1,053	22.8	27.6	19.8	21.0	6.8	2.0
16	6	725	621	3.5	660	545	18.0	643	19.4	28.4	27.8	10.1	6.5	7.8
17	3	375	317	-12.6	360	286	-3.1	277	19.1	19.9	25.7	22.7	6.5	6.1
18	2	310	296	-21.6	290	273	-15.0	232	13.4	28.0	12.9	12.1	18.5	15.1
19	1	155	102	-7.8	150	82	14.6	94	14.9	35.1	29.8	9.6	—	10.6
All diameters	39	4,730	4,277	-10.1	4,230	3,715	3.5	3,846	20.2	27.1	21.0	16.4	9.8	5.5

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Percentage distribution of log grade 1 yields, by thickness

Lumber thickness (inches)	FAS	SEL	1C	2C	3A	3B
3/4	0.9	1.0	0.2	0.5	5.3	2.3
4/4	99.1	99.0	99.8	99.5	94.7	97.7
Total tally (board feet)	775	1,044	808	630	376	213

Table 5.—PAPER BIRCH: log grade 2: dry lumber grade yield, by scaling diameter

Scaling diameter (inches)	No. logs	Scale						Total lumber tally	NHLA lumber grade yields (actual)					
		Int. 1/4-inch rule			Scribner Decimal C rule				FAS	SEL	1C	2C	3A	3B
		Gross	Net	Over-run	Gross	Net	Over-run							
		--- Board feet ---	Percent	--- Board feet ---	Percent	Board feet	----- Percent -----							
10	11	485	449	-4.7	370	337	27.0	428	—	16.6	19.6	25.9	24.8	13.1
11	34	1,935	1,801	-5.3	1,550	1,424	19.8	1,706	6.3	11.7	22.8	23.5	24.9	10.8
12	29	1,840	1,693	-8.4	1,600	1,449	7.0	1,551	5.1	19.3	19.5	27.0	20.3	8.8
13	32	2,540	2,372	-13.0	2,160	1,999	3.2	2,063	6.7	15.5	24.6	28.0	17.2	8.0
14	20	1,820	1,676	-16.3	1,810	1,463	-4.1	1,403	13.8	22.0	19.2	19.0	16.0	10.0
15	20	2,250	2,099	-13.2	2,090	1,921	-5.2	1,821	7.5	13.2	29.4	28.1	13.8	8.0
16	4	500	423	-27.7	460	361	-15.2	306	12.4	24.5	20.6	19.6	20.9	2.0
17	3	315	277	-3.2	300	258	3.9	268	34.7	18.3	20.9	15.7	4.1	6.3
18	2	325	325	-16.3	310	310	-12.3	272	31.2	29.8	13.6	15.8	9.6	—
All diameters	155	12,010	11,115	-11.7	10,450	9,522	3.1	9,818	8.9	16.7	22.8	24.8	18.1	8.7

Percentage distribution of log grade 2 yields, by thickness

Lumber thickness (inches)	FAS	SEL	1C	2C	3A	3B
1/2	—	—	0.2	—	—	—
5/8	—	—	—	—	0.2	—
3/4	—	0.8	0.9	2.6	3.2	4.2
4/4	100.0	98.8	98.9	97.4	96.3	95.8
5/4	—	0.4	—	—	0.3	—
Total tally (board feet)	871	1,644	2,242	2,429	1,780	852

Table 6.—PAPER BIRCH: log grade 3: dry lumber grade yield, by scaling diameter

Scaling diameter (inches)	No. logs	Scale						Total lumber tally	NHLA lumber grade yields (actual)					
		Int. 1/4-inch rule			Scribner Decimal C rule				FAS	SEL	1C	2C	3A	3B
		Gross	Net	Over-run	Gross	Net	Over-run							
		--- Board feet ---	Percent	--- Board feet ---	Percent	Board feet	----- Percent -----							
8	26	535	500	-3.4	430	405	19.3	483	—	1.7	2.1	15.5	33.7	47.0
9	53	1,625	1,547	-9.0	1,440	1,366	3.1	1,408	—	5.1	6.2	23.7	36.8	28.2
10	53	2,140	1,970	-8.7	1,660	1,505	19.5	1,798	0.3	4.3	9.6	31.1	34.5	20.2
11	31	1,485	1,431	-11.5	1,210	1,159	9.2	1,266	—	5.8	16.0	28.2	27.9	22.1
12	26	1,540	1,418	-11.6	1,330	1,218	3.0	1,254	1.5	7.3	11.1	25.4	33.3	21.4
13	20	1,460	1,307	-27.2	1,240	1,069	-11.0	951	5.6	7.3	20.0	28.2	19.2	19.7
14	18	1,535	1,394	-19.2	1,370	1,228	-8.2	1,127	0.4	4.5	25.3	27.5	23.7	18.6
15	8	760	655	-21.5	710	592	-13.2	514	—	10.1	30.5	15.8	22.0	21.6
16	7	735	700	-24.6	660	625	-15.5	528	4.2	7.6	29.7	24.8	17.4	16.3
17	2	300	280	-30.4	280	256	-23.8	195	37.5	11.8	8.2	16.9	16.9	8.7
18	3	480	325	-5.2	450	268	14.9	308	3.9	8.4	24.4	21.1	30.5	11.7
19	1	225	198	-5.1	210	179	5.0	188	8.5	1.6	55.8	30.9	1.1	2.1
All diameters	248	12,820	11,725	-14.5	10,990	9,870	1.5	10,020	2.0	5.8	15.9	25.9	28.6	21.8

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Percentage distribution of log grade 3 yields, by thickness

Lumber thickness (inches)	FAS	SEL	1C	2C	3A	3B
1/2	—	—	—	—	—	0.2
3/4	—	1.5	1.8	1.7	3.1	4.8
4/4	100.0	98.5	98.2	98.1	96.6	95.0
5/4	—	—	—	0.2	0.3	—
Total tally (board feet)	205	585	1,592	2,591	2,858	2,186

Table 7.—YELLOW BIRCH: log grade 1: dry lumber grade yield, by scaling diameter

Scaling diameter (inches)	No. logs	Scale						Total lumber tally	NHLA lumber grade yields (actual)							
		Int. 1/4-inch rule			Scribner Decimal C rule				Board feet	FAS	F1F	SEL	1C	2C	3A	3B
		Gross	Net	Over-run	Gross	Net	Over-run									
		--- Board feet ---	Percent	--- Board feet ---	Percent	Board feet	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
13	48	4,595	4,401	-1.3	3,880	3,709	17.1	4,344	16.8	9.2	4.6	29.7	15.7	7.5	16.5	
14	45	5,275	5,000	-6.0	4,500	4,237	11.0	4,702	22.7	8.7	3.3	29.8	16.4	5.8	13.3	
15	47	6,090	5,852	-4.9	5,560	5,309	4.8	5,566	22.1	12.1	3.2	28.7	13.9	5.2	14.8	
16	64	9,725	9,184	-4.7	8,780	8,230	6.4	8,755	23.0	9.0	2.2	31.5	14.8	7.3	12.2	
17	63	10,430	9,740	-5.3	9,490	8,837	4.4	9,226	27.9	9.6	2.0	29.3	12.4	6.0	12.8	
18	49	9,305	8,987	-2.2	8,750	8,413	4.5	8,793	35.5	10.2	2.0	26.2	10.9	5.5	9.7	
19	37	7,855	7,561	-3.1	7,360	7,071	3.7	7,330	40.1	8.8	2.2	26.4	9.4	4.5	8.6	
20	19	4,035	3,830	-3.4	3,930	3,684	0.5	3,701	31.8	11.6	3.1	31.7	9.8	4.1	7.9	
21	17	4,150	4,064	-6.5	4,010	3,923	-3.1	3,801	38.7	7.5	1.8	25.8	12.2	6.7	7.3	
22	10	2,880	2,655	-7.6	2,740	2,485	-1.3	2,453	52.9	5.4	2.1	21.2	6.8	5.7	5.9	
23	4	1,350	1,264	-4.6	1,320	1,236	-2.4	1,206	46.1	11.0	5.1	20.6	7.0	3.6	6.6	
24	4	1,415	1,356	-2.8	1,350	1,279	3.0	1,318	22.5	6.7	0.7	35.4	13.8	10.4	10.5	
25	2	620	554	-20.9	630	547	-19.9	438	32.5	7.5	0.7	25.8	20.1	5.9	7.5	
26	2	740	613	0.5	750	594	3.7	616	43.1	4.2	3.4	28.9	9.6	6.3	4.5	
27	1	540	540	-9.6	550	550	-11.3	488	58.6	10.5	1.0	17.0	6.4	4.5	2.0	
All diameters	412	69,005	65,601	-4.4	63,600	60,104	4.4	62,737	30.5	9.4	2.5	28.3	12.4	5.9	11.0	

Percentage distribution of log grade 1 yields, by thickness

Lumber thickness (inches)	FAS	F1F	SEL	1C	2C	3A	3B
3/8	—	—	—	—	—	—	—
1/2	—	0.1	—	—	—	—	—
5/8	—	—	—	0.1	—	—	0.1
3/4	1.1	1.2	2.7	3.2	2.4	2.1	2.0
4/4	71.3	62.1	66.9	73.5	72.0	71.9	64.8
5/4	12.4	15.8	14.4	10.2	12.8	12.0	5.7
6/4	5.6	9.2	10.1	5.4	3.7	1.9	3.5
8/4	5.5	5.3	5.5	5.3	4.5	9.0	19.6
9/4	—	—	—	—	0.2	1.1	2.6
10/4	4.1	6.3	0.4	2.3	2.0	1.0	0.3
12/4	—	—	—	—	—	—	1.2
16/4	—	—	—	—	2.4	1.0	0.2
Total tally (board feet)	19,156	5,871	1,579	17,770	7,758	3,701	6,902

Table 8.—YELLOW BIRCH: log grade 2: dry lumber grade yield, by scaling diameter

Scaling diameter (inches)	No. logs	Scale						Total lumber tally	NHLA lumber grade yields (actual)						
		Int. 1/4-inch rule			Scribner Decimal C rule				FAS	F1F	SEL	1C	2C	3A	3B
		Gross	Net	Over-run	Gross	Net	Over-run								
		---Board feet---		Percent	---Board feet---		Percent	Board feet	----- Percent -----						
10	49	2,670	2,480	4.7	2,160	1,997	30.0	2,597	3.4	2.5	1.5	24.9	24.3	13.4	30.0
11	124	7,990	7,387	0.4	6,260	5,783	28.3	7,420	4.0	4.6	2.6	26.5	20.2	11.7	30.4
12	161	12,060	11,170	-2.3	10,280	9,506	14.8	10,914	7.4	6.7	2.6	25.2	21.2	12.1	24.8
13	113	9,925	9,111	-7.0	8,310	7,568	12.0	8,477	5.5	4.6	1.9	27.3	23.6	12.6	24.5
14	103	10,510	9,632	-7.9	9,140	8,310	6.8	8,871	7.1	6.6	1.6	30.2	23.0	11.1	20.4
15	105	12,415	11,493	-8.3	11,440	10,522	0.1	10,537	10.8	8.3	1.8	27.5	22.8	10.2	18.6
16	46	6,210	5,589	-3.4	5,650	4,997	8.0	5,399	11.6	6.7	1.2	28.1	25.8	11.1	15.5
17	33	4,980	4,395	-4.7	4,550	3,927	6.7	4,190	5.7	4.7	1.1	31.5	24.8	11.4	20.8
18	25	4,340	3,919	-13.8	4,080	3,656	-7.6	3,377	12.5	8.4	1.9	36.0	18.2	6.6	16.4
19	24	4,330	3,939	-0.2	4,100	3,619	8.7	3,933	9.4	7.3	1.4	38.2	21.1	10.5	12.1
20	8	1,615	1,487	-16.3	1,590	1,417	-12.1	1,245	6.7	10.5	3.4	36.9	22.9	9.2	10.4
21	4	865	843	-2.1	830	820	0.6	825	18.3	4.0	-	49.3	16.1	4.4	7.9
22	4	905	733	-8.9	880	691	-3.3	668	19.0	9.3	2.7	34.1	15.7	6.6	12.6
23	5	1,325	1,223	-21.4	1,320	1,218	-21.1	961	18.2	4.7	0.6	39.7	22.4	2.7	11.7
24	1	310	305	-21.3	300	295	-18.6	240	9.6	7.9	1.7	59.5	12.5	4.6	4.2
25	2	740	740	-7.0	740	740	-7.0	688	36.7	10.0	0.3	35.6	10.3	4.9	2.2
All diameters	807	81,190	74,446	-5.5	71,630	65,066	8.1	70,342	8.4	6.3	1.8	29.4	22.2	10.9	21.0

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Percentage distribution of log grade 2 yields, by thickness

Lumber thickness (inches)	FAS	F1F	SEL	1C	2C	3A	3B
3/8	—	—	—	—	—	—	—
1/2	—	—	—	—	0.1	—	—
5/8	—	—	—	0.1	—	—	0.1
3/4	1.5	1.7	3.8	4.3	2.7	2.1	2.4
4/4	70.6	64.7	66.7	76.3	71.9	79.0	68.7
5/4	13.8	15.9	15.8	8.7	10.1	9.0	4.5
6/4	8.3	12.2	10.4	5.6	4.2	2.0	3.5
8/4	4.1	2.6	2.8	2.8	3.8	5.6	14.4
9/4	—	—	—	—	—	0.3	3.8
10/4	1.7	2.9	0.5	1.3	2.1	2.0	0.5
12/4	—	—	—	—	2.8	—	1.0
16/4	—	—	—	0.9	2.3	—	1.1
Total tally (board feet)	5,893	4,463	1,298	20,677	15,618	7,648	14,745

Table 9.—YELLOW BIRCH: log grade 3: dry lumber grade yield, by scaling diameter

Scaling diameter (inches)	No. logs	Scale						Total lumber tally	NHLA lumber grade yields (actual)							
		Int. 1/4-inch rule			Scribner Decimal C rule				FAS	F1F	SEL	1C	2C	3A	3B	
		Gross	Net	Over-run	Gross	Net	Over-run									Percent
---Board feet---			Percent			---Board feet---		Percent		-----						
8	42	995	952	8.7	740	704	47.0	1,035	—	0.4	0.7	7.4	19.9	19.0	52.6	
9	93	3,170	2,899	5.2	2,700	2,457	24.1	3,049	0.3	0.4	1.3	10.7	24.4	21.7	41.2	
10	153	6,795	6,175	-1.9	5,400	4,888	23.9	6,055	0.6	1.3	1.3	13.9	23.1	17.9	41.9	
11	89	4,580	4,163	-2.2	3,680	3,322	22.5	4,070	0.5	1.2	1.5	13.2	30.9	20.6	32.1	
12	63	3,950	3,517	-8.1	3,420	3,016	7.1	3,231	0.2	1.5	0.5	14.3	28.2	20.6	34.7	
13	48	3,830	3,381	-9.6	3,240	2,819	8.4	3,057	—	2.1	1.1	18.2	34.8	21.8	22.0	
14	32	3,015	2,749	-13.8	2,660	2,396	-1.1	2,369	0.9	1.8	1.1	20.5	27.8	14.9	33.0	
15	27	2,800	2,385	-15.2	2,630	2,159	-6.3	2,023	1.3	1.2	0.6	17.0	27.4	19.4	33.1	
16	14	1,845	1,664	-11.8	1,680	1,451	1.2	1,468	5.9	5.0	1.6	20.7	24.3	11.8	30.7	
17	11	1,465	1,214	-12.7	1,360	1,050	1.0	1,060	2.5	4.8	1.2	18.8	24.2	22.5	26.0	
18	10	1,520	1,217	-15.9	1,450	1,092	-6.2	1,024	4.7	8.6	4.1	21.3	27.2	15.0	19.1	
19	3	375	335	0.9	360	304	11.2	338	—	5.9	3.0	29.3	27.8	20.4	13.6	
20	3	520	491	-10.2	520	477	-7.5	441	2.3	5.7	—	45.9	22.7	15.2	8.2	
21	2	515	409	7.8	490	371	18.9	441	7.3	2.7	—	31.1	30.8	15.9	12.2	
22	3	690	666	-13.5	670	637	-9.6	576	4.3	6.3	—	28.6	17.0	11.1	32.7	
23	1	335	335	-4.8	330	330	-3.3	319	18.8	11.6	—	33.6	28.8	3.4	3.8	
24	1	425	387	7.5	400	349	19.2	416	39.2	—	1.4	28.1	22.6	6.5	2.2	
All diameters	595	36,825	32,939	-6.0	31,730	27,822	11.3	30,972	1.9	2.1	1.2	16.7	26.8	18.5	32.8	

Percentage distribution of log grade 3 yields, by thickness

Lumber thickness (inches)	FAS	F1F	SEL	1C	2C	3A	3B
3/8	—	—	—	—	—	—	0.1
1/2	—	—	1.0	—	—	—	0.1
5/8	—	—	—	—	—	—	0.1
3/4	2.4	0.4	0.3	2.0	2.2	2.2	2.8
4/4	80.3	68.8	77.3	80.2	74.8	83.0	78.9
5/4	17.3	26.4	14.7	14.9	9.8	12.1	5.4
6/4	—	4.4	2.8	1.8	2.5	0.5	2.5
8/4	—	—	—	0.6	1.2	1.7	6.6
9/4	—	—	—	—	—	—	1.8
10/4	—	—	3.9	0.5	1.3	0.5	0.4
12/4	—	—	—	—	7.5	—	—
16/4	—	—	—	—	0.7	—	1.3
Total tally (board feet)	577	661	366	5,179	8,299	5,732	10,158

Table 10.—BLACK CHERRY: log grade 1: dry lumber grade yield, by scaling diameter

Scaling diameter (inches)	No. logs	Scale						Total lumber tally	NHLA lumber grade yields (actual)					
		Int. 1/4-inch rule			Scribner Decimal C rule				FAS	SEL	1C	2C	3A	3B
		Gross	Net	Over-run	Gross	Net	Over-run							
		--- Board feet ---	Percent	--- Board feet ---	Percent	Board feet	----- Percent -----							
13	19	1,675	1,614	1.3	1,390	1,331	22.8	1,635	28.2	28.5	15.8	13.1	8.0	6.4
14	24	2,540	2,503	2.8	2,200	2,163	19.0	2,574	27.8	27.3	18.1	13.7	9.9	3.2
15	24	3,115	3,016	0.8	2,820	2,719	11.8	3,041	38.5	21.8	16.0	13.1	8.3	2.3
16	30	4,120	3,957	-0.7	3,740	3,570	10.0	3,928	34.5	20.0	18.9	15.7	7.2	3.7
17	23	3,435	3,328	-1.7	3,180	3,080	6.2	3,272	30.8	25.7	21.5	10.8	7.3	3.9
18	19	3,215	3,045	-3.0	3,000	2,802	5.5	2,955	37.3	20.3	21.3	12.4	4.1	4.6
19	19	4,065	3,990	0.7	3,810	3,718	8.1	4,018	41.5	20.8	16.5	12.1	5.6	3.5
20	13	2,830	2,725	3.1	2,760	2,661	5.6	2,810	30.5	28.4	19.3	13.5	5.8	2.5
21	4	945	930	-5.9	920	903	-3.1	875	42.6	21.1	17.7	9.0	7.4	2.2
22	4	950	904	2.3	920	861	7.4	925	47.8	17.3	11.1	12.4	4.6	6.8
24	2	565	475	-11.2	550	460	-8.3	422	49.7	17.3	19.2	3.8	1.2	8.8
25	3	960	900	-3.8	970	897	-3.5	866	38.7	21.2	21.0	7.6	7.6	3.9
All diameters	184	28,415	27,387	-0.2	26,260	25,165	8.6	27,321	35.5	23.0	18.3	12.6	6.8	3.8

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Percentage distribution of log grade 1 yields, by thickness

Lumber thickness (inches)	FAS	SEL	1C	2C	3A	3B
1/2	—	—	0.1	0.1	—	0.5
3/4	0.4	0.1	0.1	—	0.4	1.9
4/4	42.8	49.7	70.2	84.8	77.2	85.9
5/4	2.2	2.9	2.6	3.0	1.8	—
6/4	23.7	19.9	17.3	6.4	2.5	—
7/4	—	—	—	—	0.5	—
8/4	30.9	27.4	9.7	5.3	17.6	11.7
12/4	—	—	—	0.4	—	—
Total tally (board feet)	9,701	6,291	5,010	3,443	1,851	1,025

Table 11.—BLACK CHERRY: log grade 2: dry lumber grade yield, by scaling diameter

Scaling diameter (inches)	No. logs	Scale						Total lumber tally	NHLA lumber grade yields (actual)					
		Int. 1/4-inch rule			Scribner Decimal C rule				FAS	SEL	1C	2C	3A	3B
		Gross	Net	Over-run	Gross	Net	Over-run							
		--- Board feet ---		Percent	--- Board feet ---		Percent	Board feet	----- Percent -----					
10	9	455	455	5.7	350	350	37.4	481	9.4	20.4	23.0	22.7	16.8	7.7
11	42	2,270	2,159	3.4	1,800	1,723	29.6	2,233	4.9	10.0	27.5	26.4	19.8	11.4
12	65	4,405	4,230	-0.7	3,800	3,641	15.4	4,201	7.3	16.0	25.9	27.6	16.1	7.1
13	49	3,920	3,743	-1.8	3,270	3,086	19.1	3,676	7.2	14.5	31.1	25.5	15.9	5.8
14	42	3,620	3,475	-5.8	3,220	3,101	5.6	3,275	11.2	17.6	32.2	20.3	12.4	6.3
15	36	4,010	3,891	-5.5	3,680	3,557	3.4	3,678	8.7	19.2	33.6	22.4	10.1	6.0
16	19	2,130	2,046	-5.4	1,960	1,874	3.3	1,935	9.8	16.0	35.1	20.2	8.1	10.8
17	20	2,830	2,737	-2.4	2,600	2,498	7.0	2,672	7.9	19.7	36.8	21.4	12.0	2.2
18	15	2,565	2,428	-3.3	2,400	2,271	3.3	2,347	12.4	17.9	40.5	17.3	8.5	3.4
19	8	1,565	1,441	-11.3	1,460	1,337	-4.4	1,278	11.8	11.8	40.3	20.6	10.4	5.1
20	5	945	865	1.6	930	851	3.3	879	10.0	19.9	35.8	17.6	11.5	5.2
21	2	350	275	12.0	340	267	15.4	308	27.3	23.4	25.3	14.6	4.9	4.5
All diameters	312	29,065	27,745	-2.8	25,810	24,556	9.8	26,963	9.0	16.6	32.5	22.7	12.9	6.3

Percentage distribution of log grade 2 yields, by thickness

Lumber thickness (inches)	FAS	SEL	1C	2C	3A	3B
5/8	—	—	—	—	0.2	—
3/4	0.4	0.4	0.2	0.3	1.0	0.5
4/4	69.4	66.1	80.9	91.7	70.5	85.6
5/4	1.2	3.0	1.8	1.2	0.1	0.8
6/4	11.4	15.6	9.5	4.0	2.0	0.5
7/4	—	—	—	—	—	0.6
8/4	17.6	14.9	7.6	2.8	23.6	10.2
12/4	—	—	—	—	2.6	1.8
Total tally (board feet)	2,422	4,467	8,764	6,115	3,491	1,704

Table 12.—BLACK CHERRY: log grade 3: dry lumber grade yield, by scaling diameter

Scaling diameter (inches)	No. logs	Scale						Total lumber tally	NHLA lumber grade yields (actual)					
		Int. 1/4-inch rule			Scribner Decimal C rule				FAS	SEL	1C	2C	3A	3B
		Gross	Net	Over-run	Gross	Net	Over-run							
		---Board feet---	Percent	---Board feet---	Percent	Board feet	-----Percent-----							
8	34	710	650	12.3	560	513	42.3	730	—	2.3	4.2	29.7	42.6	21.2
9	52	1,515	1,437	8.5	1,350	1,268	22.9	1,559	—	3.2	10.1	36.4	33.5	16.8
10	75	3,115	2,979	-0.6	2,520	2,398	23.5	2,962	1.1	3.2	15.7	40.9	29.8	9.3
11	55	2,665	2,508	-3.7	2,150	2,013	20.0	2,415	0.9	3.5	19.7	39.0	27.0	9.9
12	45	2,535	2,378	-1.9	2,190	2,022	15.3	2,332	1.0	3.7	24.0	37.4	21.6	12.3
13	22	1,625	1,493	-2.9	1,380	1,253	15.7	1,450	1.4	6.7	26.1	37.9	18.0	9.9
14	28	2,450	2,351	-4.6	2,170	2,060	8.9	2,243	4.8	8.8	27.1	33.8	18.1	7.4
15	15	1,535	1,424	-4.6	1,420	1,316	3.2	1,358	4.0	3.4	43.5	29.5	14.7	4.9
16	10	1,085	1,014	-3.7	1,000	924	5.6	976	6.1	7.9	43.0	21.5	12.0	9.5
17	2	275	275	-8.4	260	260	-3.1	252	5.2	7.9	55.1	14.3	12.7	4.8
18	5	610	545	-9.7	590	529	-7.0	492	13.4	7.3	41.7	19.1	9.6	8.9
19	1	125	115	-8.7	120	110	-4.5	105	—	—	76.1	12.4	2.9	8.6
20	1	175	155	-7.7	170	150	-4.7	143	38.4	16.8	16.1	16.1	8.4	4.2
All diameters	345	18,520	17,324	-1.8	15,880	14,816	14.9	17,017	2.7	4.9	24.3	34.6	23.2	10.3

Percentage distribution of log grade 3 yields, by thickness

Lumber thickness (inches)	FAS	SEL	1C	2C	3A	3B
3/8	—	—	0.1	—	0.1	—
1/2	—	—	—	0.1	—	0.1
5/8	—	0.3	—	—	—	—
3/4	—	—	0.2	0.3	0.5	0.3
4/4	82.2	83.3	89.4	91.9	67.9	83.7
5/4	1.3	3.9	1.4	2.6	0.3	0.4
6/4	13.1	9.3	8.3	2.4	0.6	0.4
7/4	—	—	—	—	0.3	—
8/4	3.4	3.2	0.6	2.7	27.3	14.3
12/4	—	—	—	—	3.0	0.8
Total tally (board feet)	455	829	4,129	5,898	3,946	1,760

Table 13.—RED MAPLE: log grade 1: dry lumber grade yield, by scaling diameter

Scaling diameter (inches)	No. logs	Scale						Total lumber tally	NHLA lumber grade yields (actual)							
		Int. 1/4-inch rule			Scribner Decimal C rule				FAS	F1F	SEL	1C	2A	2B	3A	3B
		Gross	Net	Over run	Gross	Net	Over-run									
		--- Board feet ---		Percent	--- Board feet ---		Percent	Board feet	----- Percent -----							
13	25	2,455	2,380	-4.2	2,060	1,991	14.5	2,279	17.2	14.6	5.0	27.3	17.6	7.9	6.7	3.7
14	25	2,910	2,747	3.1	2,470	2,297	23.3	2,833	21.6	19.6	5.8	15.5	21.1	11.1	3.7	1.6
15	27	3,760	3,686	-4.3	3,380	3,296	7.0	3,526	25.4	17.0	7.9	18.1	14.2	10.2	6.1	1.1
16	31	4,590	4,447	-0.7	4,140	3,962	11.4	4,414	25.4	16.3	4.6	20.8	18.7	9.0	3.0	2.2
17	29	4,910	4,713	-4.3	4,440	4,239	6.4	4,510	25.5	15.1	3.2	26.9	18.9	7.1	2.1	1.2
18	15	2,580	2,520	-0.9	2,420	2,343	6.6	2,497	30.8	18.3	8.2	20.7	15.8	2.7	2.3	1.2
19	12	2,630	2,541	-1.0	2,460	2,350	7.0	2,515	31.1	13.9	4.2	19.1	15.0	12.8	3.1	0.8
20	8	1,920	1,872	-2.4	1,880	1,820	0.4	1,828	34.4	19.4	5.6	19.0	17.0	2.5	1.8	0.3
21	4	900	865	-5.0	880	830	-1.0	822	32.3	19.5	3.5	23.7	15.0	3.2	1.5	1.3
22	3	825	798	-0.1	790	764	4.3	797	19.1	6.6	2.3	42.8	12.4	2.5	8.0	6.3
23	1	285	285	10.5	280	280	12.5	315	50.4	10.2	9.5	12.1	15.6	2.2	—	—
24	1	310	310	-14.5	300	300	-11.7	265	7.9	9.8	3.4	38.5	30.6	—	3.8	6.0
25	1	400	265	2.3	400	265	2.3	271	13.3	1.5	0.4	46.1	25.8	11.8	0.7	0.4
All diameters	182	28,475	27,429	-2.0	25,900	24,737	8.6	26,872	26.0	16.1	5.2	22.2	17.4	7.8	3.6	1.7

Percentage distribution of grade 1 logs yields, by thickness

Lumber thickness (inches)	FAS	F1F	SEL	1C	2A	2B	3A	3B
1/2	—	—	—	0.1	0.1	0.1	—	—
5/8	—	—	—	—	—	—	0.2	—
3/4	0.2	0.6	—	0.7	0.5	1.7	1.5	1.7
4/4	56.0	66.1	69.1	67.4	52.9	58.3	62.7	70.4
5/4	10.9	8.5	5.8	11.5	12.3	14.7	5.1	2.6
6/4	13.6	13.1	13.5	7.1	1.5	1.5	1.9	3.6
7/4	—	—	—	0.1	0.1	0.3	0.3	3.9
8/4	19.3	11.7	11.6	13.1	11.6	11.3	19.3	17.8
10/4	—	—	—	—	0.3	12.1	9.0	—
12/4	—	—	—	—	20.3	—	—	—
24/4	—	—	—	—	0.4	—	—	—
Total tally (board feet)	6,988	4,322	1,404	5,978	4,678	2,090	955	457

Table 14.—RED MAPLE: log grade 2: dry lumber grade yield, by scaling diameter

Scaling diameter (inches)	No. logs	Scale						Total lumber tally	NHLA lumber grade yields (actual)								
		Int. 1/4-inch rule			Scribner Decimal C rule				Board feet	FAS	F1F	SEL	1C	2A	2B	3A	3B
		Gross	Net	Over-run	Gross	Net	Over-run										
		--- Board feet ---		Percent	--- Board feet ---		Percent										
10	11	595	563	3.4	460	428	36.0	582	11.3	9.5	5.2	18.2	20.1	16.5	8.2	11.0	
11	74	4,745	4,546	0.8	3,880	3,685	24.4	4,584	2.9	6.9	3.5	21.5	31.4	18.9	6.9	8.0	
12	88	6,650	6,297	-1.4	5,650	5,315	16.9	6,211	5.8	9.0	4.7	22.9	29.6	16.3	6.9	4.8	
13	70	6,135	5,722	-2.7	5,210	4,768	16.7	5,565	4.7	9.9	4.5	19.9	39.5	10.6	6.1	4.8	
14	58	5,480	5,140	-4.4	4,820	4,437	10.8	4,916	7.3	10.8	4.4	25.1	28.9	11.7	7.2	4.6	
15	46	5,340	5,016	-3.2	4,900	4,516	7.5	4,855	11.4	12.7	2.6	25.4	27.5	11.8	4.2	4.4	
16	32	4,120	3,833	-1.0	3,760	3,450	10.0	3,795	8.7	11.2	3.0	31.0	33.2	6.2	4.2	2.5	
17	19	2,515	2,375	4.0	2,360	2,206	11.9	2,469	8.3	9.1	3.0	32.8	27.4	9.7	5.2	4.5	
18	9	1,485	1,351	-12.1	1,400	1,242	-4.3	1,188	14.1	5.7	4.0	30.6	27.2	5.0	9.4	4.0	
19	8	1,660	1,515	-9.7	1,560	1,374	-0.4	1,368	22.3	11.5	4.3	27.0	22.1	6.1	5.7	1.0	
20	4	845	826	-9.0	830	806	-6.7	752	36.6	19.1	4.5	14.2	17.0	0.7	3.2	4.7	
21	5	1,145	993	-7.9	1,100	908	0.8	915	30.4	14.4	8.0	19.8	16.7	2.7	5.6	2.4	
All diameters	424	40,715	38,177	-2.6	35,930	33,135	12.3	37,200	8.8	10.2	4.0	24.5	30.1	11.7	6.0	4.7	

Percentage distribution of log grade 2 yields, by thickness

Lumber thickness (inches)	FAS	F1F	SEL	1C	2A	2B	3A	3B
1/2	—	—	—	0.1	—	—	0.2	—
3/4	0.1	0.3	—	0.7	0.7	1.8	0.8	0.6
4/4	63.5	61.5	66.1	74.8	60.7	63.7	68.0	70.1
5/4	9.7	15.0	14.1	8.7	8.9	13.9	4.3	3.5
6/4	13.5	15.3	15.3	7.4	1.4	—	1.5	—
7/4	—	0.2	—	0.1	0.4	—	0.4	2.7
8/4	13.2	7.7	4.5	8.2	6.4	12.9	23.7	19.9
9/4	—	—	—	—	0.1	0.2	—	1.2
10/4	—	—	—	—	0.7	7.5	1.1	—
12/4	—	—	—	—	19.5	—	—	2.0
24/4	—	—	—	—	1.2	—	—	—
Total tally (board feet)	3,290	3,778	1,471	9,099	11,202	4,361	2,238	1,761

Table 15.—RED MAPLE: log grade 3: dry lumber grade yield, by scaling diameter

Scaling diameter (inches)	No. logs	Scale						Total lumber tally	NHLA lumber grade yields (actual)							
		Int. 1/4-inch rule			Scribner Decimal C Rule				FAS	F1F	SEL	1C	2A	2B	3A	3B
		Gross	Net	Over-run	Gross	Net	Over-run									
		--- Board feet ---		Percent	--- Board feet ---		Percent	Board feet	----- Percent -----							
8	67	1,630	1,578	9.3	1,300	1,254	37.5	1,724	—	0.1	0.3	2.6	20.0	44.1	14.4	18.5
9	116	3,880	3,729	2.0	3,370	3,225	17.9	3,803	0.2	0.9	1.6	6.2	31.8	36.3	12.4	10.6
10	163	7,160	6,839	-1.2	5,770	5,489	23.1	6,756	0.6	1.1	2.4	9.8	31.8	35.1	11.5	7.7
11	94	5,010	4,799	-0.5	4,060	3,866	23.6	4,777	0.4	0.8	1.5	9.5	36.4	34.2	9.7	7.5
12	67	4,175	3,925	-4.2	3,620	3,388	11.0	3,762	0.5	1.4	1.2	13.3	39.2	24.2	13.2	7.0
13	51	3,980	3,738	-6.4	3,370	3,150	11.0	3,497	1.5	4.6	1.3	14.2	39.2	27.6	7.1	4.5
14	35	3,100	2,823	-11.9	2,740	2,447	1.6	2,487	1.4	4.5	1.1	17.8	36.9	22.1	11.9	4.3
15	18	1,905	1,781	-5.3	1,770	1,626	3.7	1,686	6.3	8.4	0.9	31.9	29.7	11.8	8.2	2.8
16	7	890	850	-15.5	810	774	-7.2	718	—	10.7	0.8	21.0	47.7	11.4	7.8	0.6
17	7	1,015	949	-0.1	940	869	9.1	948	12.8	14.0	3.9	21.1	19.2	9.4	16.5	3.1
18	4	620	531	-2.4	580	490	5.7	518	10.2	6.0	2.1	38.5	21.0	7.3	6.0	8.9
19	1	190	190	-3.2	180	180	2.2	184	—	—	—	23.9	46.2	9.8	1.6	18.5
All diameters	630	33,555	31,732	-2.7	28,510	26,758	15.3	30,860	1.5	2.8	1.6	12.8	33.7	29.2	11.0	7.4

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Percentage distribution of log grade 3 yields, by thickness

Lumber thickness (inches)	FAS	F1F	SEL	1C	2A	2B	3A	3B
1/2	—	—	—	0.1	—	—	—	0.1
5/8	—	—	—	—	—	—	—	0.1
3/4	—	—	—	1.3	0.5	2.8	1.5	1.6
4/4	75.5	75.1	75.5	81.1	60.0	72.7	64.6	82.0
5/4	5.8	12.1	14.5	8.2	8.5	10.5	4.7	3.3
6/4	18.7	7.6	9.2	5.4	0.9	0.2	0.2	0.5
7/4	—	2.2	—	—	—	—	—	—
8/4	—	3.0	0.8	3.9	2.6	3.4	12.0	12.4
10/4	—	—	—	—	0.3	10.4	17.0	—
12/4	—	—	—	—	25.0	—	—	—
24/4	—	—	—	—	2.2	—	—	—
Total tally (board feet)	450	854	488	3,965	10,429	9,003	3,386	2,285