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Research Note

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WHITE FIR LUMBER RECOVERY AT A WESTERN WASHINGTON SAWMILL

by

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In April 1956 a study[1/] was made in western Washington to determine grades of lumber that could be expected from silver fir (Abies amabilis) and grand fir (Abies grandis) which are grouped together by the lumber industry and sold as white fir. At the sawmill where the study was made, none of the lumber is seasoned and most of it is sold surfaced-green. The headrig at this mill is used primarily to produce side-cut lumber and for breaking the remainder of the log into large cants which are sent to the sash gang. Most of the lumber produced is two inches thick.

In this study, 166 logs were followed through the mill and each piece of lumber was graded and tallied by individual logs. Approximately two-thirds of the logs in this study came from the Olympic Peninsula and the remainder from the west slope of the Cascade Range. Logs varied in length from 16 to 40 feet with the majority in the 32- to 40-foot class.

Test Procedure

Approximately every fourth log coming into the mill was designated as a test log. These logs were numbered consecutively and scaled and graded by a representative of the Grays Harbor Log Scaling and Grading Bureau according to their official rules of February 1954.

1/ Cooperative project of West Coast Lumber Inspection Bureau, Grays Harbor Log Scaling and Grading Bureau, Bureau of Land Management, Bureau of Indian Affairs, and the U. S. Forest Service.

Since this mill was equipped with a sash gang, resaw, and other machinery that caused lumber from one log to become mixed with other lumber, it was necessary to mark lumber from test logs carefully. Five colors of paint were used. All lumber from the first log was marked red, and that from each of the four succeeding logs with separate colors. By the time the color series had been completed, the lumber from the first log had cleared the mill. Men were stationed at the headrig, sash gang, and resaw to be sure that all lumber from the test logs was properly marked.

A representative of West Coast Lumber Inspection Bureau grade-marked on the green chain every board from test logs. Then two men tallied each piece of lumber, using a separate sheet for each log. Lumber was graded according to Standard Grading and Dressing Rules No. 15 effective March 1956.

Lumber Grade Recovery

Lumber grade recoveries obtained in sawmill log grades 2 and 3 are shown in tables 1 and 2 and figures 1 and 2. Only a very few logs in the Peeler and No. 1 grades were available and did not give an adequate sampling for developing reliable data. However, for information only, recovery data for the 4 Peelers and 6 No. 1 logs are shown in the summary table 3.

Data in these tables and graphs have been rounded to smooth inconsistencies in diameter groups and to strengthen the data where there was insufficient sampling.

Log rules used by the log scaling and grading bureaus in the Douglas-fir subregion are based on the end products the logs will produce. No. 2 white fir logs must be capable of producing not less than 65 percent of the net scaled content in Construction or Better lumber. No. 3 logs must be capable of producing not less than one-third of the net scale content in Standard or Better lumber. Since the log rules are based on prescribed grade recovery of the net log scale, the lumber recovery data shown in this report are computed on the same basis.

Ordinarily sawmills on the west side of the Cascades cut a minimum amount of boards. This procedure was followed at this mill. The percentage of the common grades of lumber that was cut into boards during this study is shown in table 4.

All lumber data presented in this report are based on volumes and grades obtained on the green chain. Some loss in both volume and grade would have been expected if the lumber had been dried.

Table 1--Lumber grade recoveries in percent of net log scale

No. 2 white fir logs

Diameter class in inches	Lumber grade										No. of logs
	B	C	D	Select Merch.	Select Struc.	Construction	Standard	Utility	Economy	Total	
14	2.9	3.6	0.6	2.1	45.2	75.0	14.4	7.5	0.0	151.3	11
15	3.0	4.1	0.5	1.9	40.6	69.8	14.1	11.7	1.5	147.2	9
16	3.2	4.5	0.5	1.6	36.3	65.1	13.7	15.7	3.1	143.7	19
17	3.3	4.9	0.4	1.4	32.5	60.7	13.4	19.3	4.7	140.6	12
18	3.4	5.2	0.5	1.1	29.0	56.8	13.1	22.5	6.1	137.7	6
19	3.6	5.4	0.5	0.9	25.8	53.4	12.8	25.5	7.3	135.2	0
20	3.6	5.8	0.4	0.8	23.0	50.3	12.6	28.0	8.4	132.9	9
21	3.7	6.0	0.4	0.6	20.7	47.6	12.4	30.0	9.6	131.0	8
22	3.8	6.2	0.4	0.4	18.7	45.3	12.3	32.1	10.1	129.3	7
23	3.9	6.3	0.4	0.3	17.0	43.5	12.2	33.6	10.8	128.0	7
24	3.9	6.5	0.3	0.3	15.7	42.1	12.1	34.7	11.3	126.9	1
25	3.9	6.6	0.3	0.3	14.8	41.0	12.0	35.6	11.7	126.2	0
26	4.0	6.6	0.3	0.2	14.3	40.4	12.0	36.1	11.8	125.7	2
27	4.0	6.7	0.2	0.2	14.1	40.3	11.9	36.3	11.9	125.6	2
28	4.0	6.7	0.2	0.2	14.1	40.3	11.9	36.3	11.9	125.6	1
29	4.0	6.7	0.2	0.2	14.1	40.3	11.9	36.3	11.9	125.6	0
30	4.0	6.7	0.2	0.2	14.1	40.3	11.9	36.3	11.9	125.6	3

Table 2.--Lumber grade recoveries in percent of net log scale, No. 3 white fir logs

Diameter class in inches	Lumber grade										No. of logs
	B	C	D	Select Merch.	Select Struc.	Construction	Standard	Utility	Economy	Total	
9	0.5	5.0	0.3	1.4	29.2	109.8	31.4	0.0	0.0	177.6	1
10	0.5	4.7	0.3	1.4	26.5	99.6	29.5	0.0	0.0	162.5	9
11	0.4	4.4	0.3	1.5	24.0	90.1	27.8	5.3	0.0	153.8	7
12	0.4	4.2	0.2	1.5	21.7	81.3	26.2	12.3	1.8	149.6	8
13	0.4	4.0	0.2	1.5	19.6	73.2	24.6	18.8	4.1	146.4	7
14	0.4	3.8	0.1	1.6	17.6	65.8	23.3	24.6	6.2	143.4	6
15	0.3	3.7	0.1	1.6	15.9	59.1	22.0	30.0	8.1	140.8	2
16	0.3	3.5	0.1	1.6	14.3	53.2	20.9	34.6	9.9	138.4	4
17	0.3	3.3	0.1	1.6	13.0	47.8	20.0	38.8	11.4	136.3	2
18	0.3	3.2	0.1	1.6	11.8	43.3	19.1	42.4	12.6	134.4	5
19	0.3	3.0	0.1	1.6	10.9	39.4	18.4	45.5	13.7	132.9	2
20	0.3	2.9	0.1	1.6	10.0	36.3	17.8	48.0	14.6	131.6	3
21	0.3	2.9	0.0	1.7	9.3	33.9	17.3	50.0	15.2	130.6	1
22	0.3	2.9	0.0	1.7	8.8	32.1	17.1	51.3	15.8	130.0	0
23	0.2	2.9	0.0	1.7	8.6	31.1	16.9	52.1	16.1	129.6	1
24	0.2	2.9	0.0	1.7	8.5	30.8	16.8	52.4	16.1	129.4	0
25	0.2	2.9	0.0	1.7	8.5	30.8	16.8	52.4	16.1	129.4	0
26	0.2	2.9	0.0	1.7	8.5	30.8	16.8	52.4	16.1	129.4	0
27	0.2	2.9	0.0	1.7	8.5	30.8	16.8	52.4	16.1	129.4	0
28	0.2	2.9	0.0	1.7	8.5	30.8	16.8	52.4	16.1	129.4	0
29	0.2	2.9	0.0	1.7	8.5	30.8	16.8	52.4	16.1	129.4	0
30	0.2	2.9	0.0	1.7	8.5	30.8	16.8	52.4	16.1	129.4	1

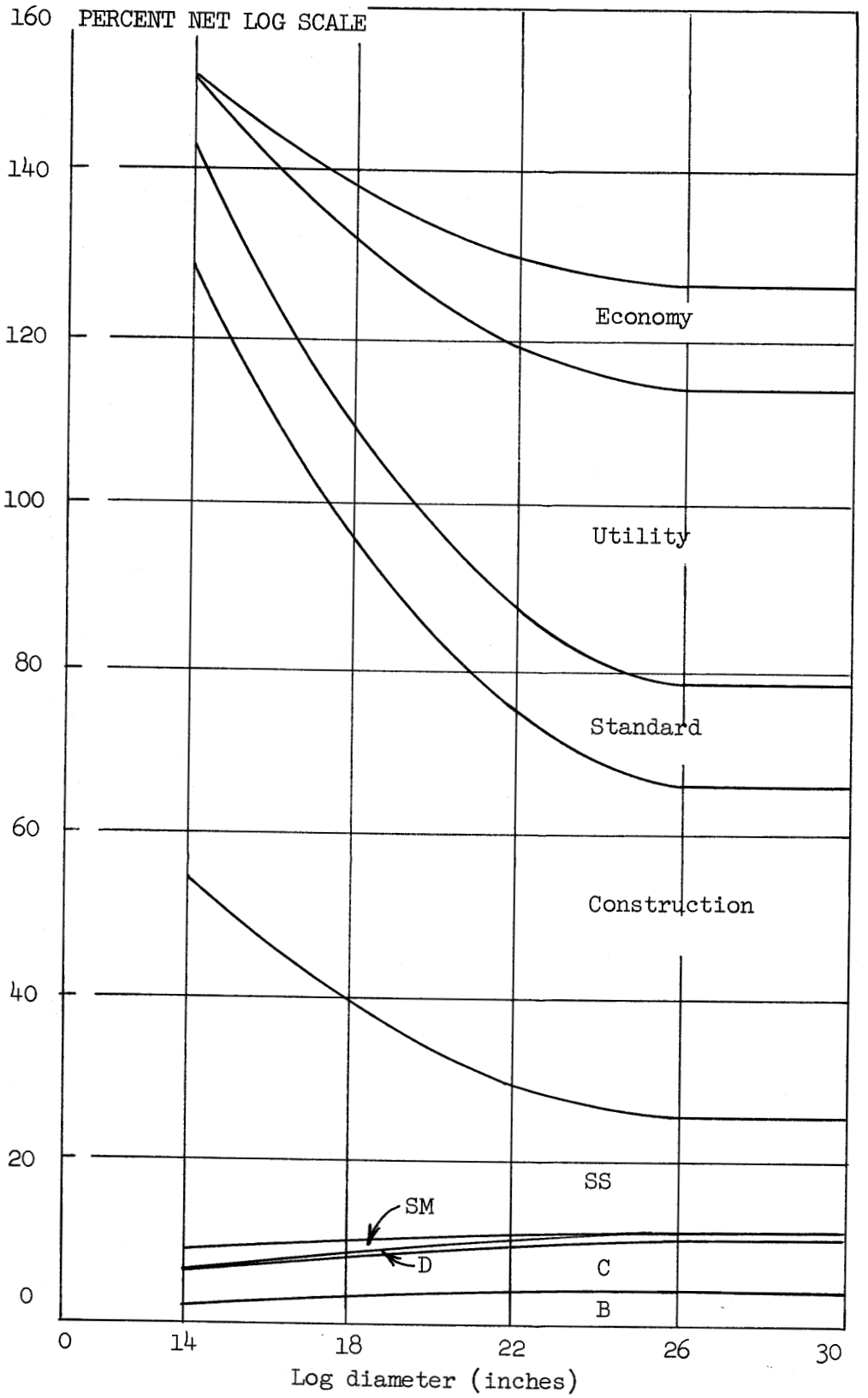

Figure No. 1.--Cumulative grade recoveries in percent of net log scale No. 2 white fir logs

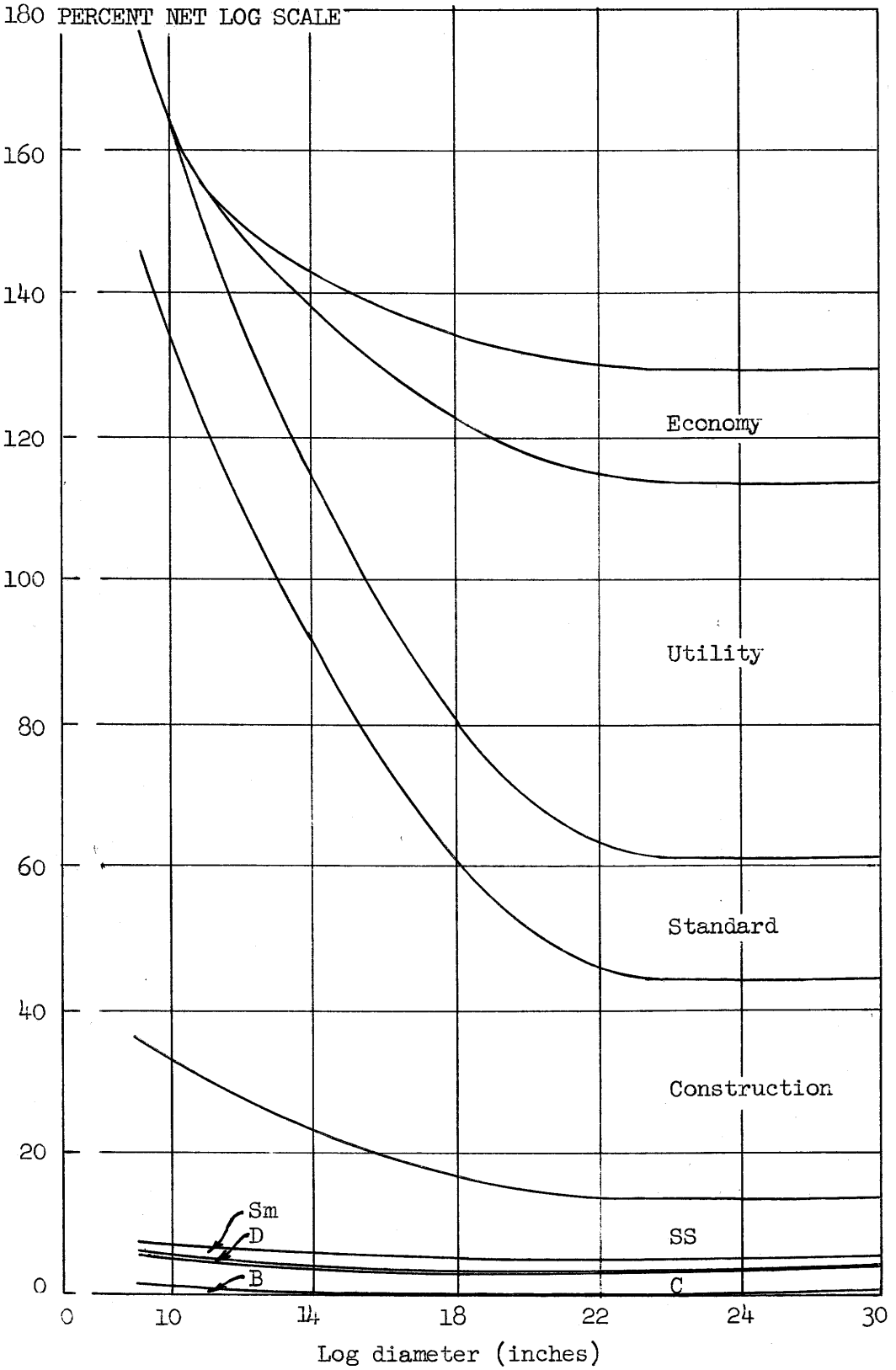

Figure No. 2.--Cumulative grade recoveries in percent of net log scale No. 3 white fir logs

Table 3.--Summary of volume and lumber grade recovery for all test logs

Log grade	Logs	Net log volume	Lumber tally	Overrun	Grade recovery in percent of net log scale (green chain tally)								
					B and Btr.	C	D	Sel. Mer.	Sel. Struc.	Const.	Standard	Utility	Economy
	Number	Board-feet	Board-feet	Percent	Percent								
Peeler[1/]	4	5,550	7,854	41.5	20.1	11.7	1.6	0.2	16.7	46.7	9.5	25.5	9.5
No. 1[1/]	6	6,080	7,987	31.4	3.0	16.0	0.0	0.2	7.5	35.2	12.2	42.1	15.2
No. 2	97	49,883	67,222	34.8	3.6	5.5	0.4	0.9	25.4	52.8	12.8	25.9	7.5
No. 3	59	14,623	20,568	40.7	0.3	3.6	0.2	1.5	16.0	58.8	22.0	30.1	8.2
Total	166	76,136	103,631	36.1									

1/ Insufficient logs available for adequate sampling.

Table 4.--Board volume in percent of common lumber

Log grade	Lumber grade			
	Construction	Standard	Utility	Economy
	Percent			
No. 2 Sawmill	5.3	3.8	2.6	1.2
No. 3 Sawmill	4.2	3.3	3.9	1.5

Overrun

Overrun averaged 35 percent for the No. 2 logs and 41 percent for the No. 3. Overrun by diameter class can be read directly from the top curve in figures 1 and 2. Often Economy grade of lumber is not included in figuring overrun. If this appears desirable, overrun for Utility and Better lumber can be obtained from the next to the top curve of the same two figures.