Guide for Cutting New England Northern Hardwoods

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

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Loading beech logs, Green Mountain National Forest, Vt.

GUIDE FOR CUTTING NEW ENGLAND NORTHERN HARDWOODS

Prepared by Northeastern Forest Experiment Station, Forest Service [1]

Description of the Forest

In true northern hardwood stands the key trees, yellow birch, beech, and sugar maple, make up over 50 percent of the trees 6 inches or more in diameter, breast high.[2] With them may be soft maple, ash, basswood, paper birch, hemlock, spruce, and pine. In the border zones, between northern hardwoods and other types, trees common to those types are mingled and northern hardwood harvesting practices may not fully apply. To get the most out of such a forest consult a trained forester, who knows markets and how to handle the different kinds of trees.[3]

Estimate the Stand

If you plan to sell standing trees for the buyer to cut, you will need to make a complete inventory of the salable

[1] 614 Bankers Securities Building, Philadelphia 7, Pa.

[2] Diameter breast high is at 4½ feet above average ground level. Stump diameter is an inch or two larger.

[3] Your State Forester, extension forester, local Forest Service officer, foresters of other Government agencies, or private consulting foresters can help you estimate, mark, manage, and market your trees. Seek their counsel before cutting. For more detailed information obtain a copy of U. S. Department of Agriculture Farmers' Bulletin 1210, Measuring and Marketing Farm Timber.

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trees on the tract. If you plan to cut your own timber, and sell logs, measure a sample, perhaps 10 or 20 percent of the trees of cutting size, to get a fair idea of the volume and quality of timber available. Scale the logs after cutting to correct this rough estimate.

Knowing what you have to sell, you are in a position to secure a fair price for it. In making an inventory, tally all trees 8 inches and larger, designating them as best fitted for saw timber, pulpwood, or perhaps just fuel wood, by using a form similar to that shown on pages 6 and 7. In general, only trees 14 inches and larger in diameter should be used for saw timber. *Do not cut the trees below 14 inches unless they are crowded and need thinning.*

The timber-estimating form, just referred to, is merely a guide. Figures from a sample 1-acre tally have been inserted to illustrate its use. The headings dealing with products might be changed, where appropriate, to include mine props, or to exclude items not marketable.

Plan a 40-percent Cut of Saw-logs

A good general rule to follow in New England northern hardwood saw-timber stands is to harvest no more than about 40 percent of the total board foot volume. For example, the figures used on the sample form show 4,721 board feet per acre. Forty percent would be 1,888 board feet per acre. The volume cut will be restored by growth within 10 to 18 years, when

a second cut, yielding even higher-value timber, should be possible.

Mark the trees to be cut, selecting the largest ones first and taking out the deformed, injured trees for pulpwood, fuel wood, posts, and poles. Leave clean-boled, straight, vigorous trees of sugar maple, yellow birch, ash, basswood, or other valuable trees. Their value will depend on probable future markets.[4] As a rule, if the stand runs heavily to beech, try to leave no more than half the reserve volume in this species. Cut sprout clumps of red maple. Leave enough trees nearby to protect any reserved yellow birch, since exposure to direct sun and wind may kill it. Free the crowns of trees to be reserved.

Note carefully the yellow birch or maple trees which might make valuable veneer logs and, if possible, sell them as such.

Some acres will be cut heavily and some lightly, but over any 5 acres the cut should add up to about 40 percent of the total board-foot volume. *Do not clear-cut patches larger than 1 acre* without professional advice, as doing so usually favors an invasion of pin cherry and aspen. Space the reserved trees closely around small, clear-cut patches to protect against windfall.

Small Trees

If the merchantable volume is made up of large logs, rather than many

[4] Local markets determine the kind and value of trees suitable for saw or veneer logs, pulpwood, chemical wood, or fuel wood. The local market and value of each product should be ascertained. Usually the best values are obtained for veneer or sawlogs. Smaller or less valuable trees and tops may be utilized for pulpwood or chemical wood if not needed for future saw timber, and fuel wood is usually made from tops or trees not suitable for other products.

small ones, it will cost much less per thousand board feet to cut and haul. This will make for greater profit, if you do your own logging. It should result in a better price, if you sell stumpage, because the operator can log with less expense.

Trees below 14 inches in diameter in the northern hardwood type can seldom be logged for saw timber at a profit. Lumber produced from 12-inch trees requires 30 percent more labor than from 18-inch trees, and 40 percent more than from 24-inch trees.

The value of lumber from 10-inch trees is usually less than two-thirds that of lumber from 24-inch trees.

It takes almost twice as long to cut and peel 100 cubic feet of pulpwood from 5- to 8-inch trees as from 11- to 17-inch trees.

A cordwood cutter can produce 2 cords from 12-inch trees in the same time that it takes to cut 1 cord from 4-inch trees. Clear-cut stands often average 4 logs more per thousand board feet of lumber than selectively cut stands. Thus, clear cutting, which takes the small trees, means a larger number of logs to haul and mill and handle for every thousand board feet of lumber produced.

Do Not Cut—

If the merchantable volume is less than about 1,800 board feet per acre (except for specialty products, such as veneer logs, which comprise few trees but represent a high stumpage value). To make a 40-percent cut in such understocked stands would probably be unprofitable and ruinous to the

stand. This does not mean that young, dense pole stands should not be thinned for fuel wood, chemical wood, or pulpwood.

SCALING LOGS

Measure the volume of logs cut by using one of the log rules on page 8. The Doyle rule is most commonly used in the East, but it benefits the buyer by giving too low a volume for logs under 28 inches in diameter. The Scribner rule is more accurate, but the International is the fairest and most accurate. It allows a ¼-inch saw kerf and gives the lumber content of the log resulting from careful sawing by good methods. If another rule is proposed, check it against the values given on page 8 to see how it varies from the International rule.

(1)	(2)	(3)	(4)			(5)	(6)	
	Hardwoods							
Tree diameter class [2] (inches)	Board feet per tree	Cords per tree [3]	Number of trees			Volume, board feet	Volume, cords	
			Saw timber	Pulp-wood	Fuel wood		Pulp-wood	Fuel wood
8	.....	0.20	.....	3	1	.....	0.60	0.20
9	.....	.25	.....	4	1	.....	1.00	.25
10	42	.30	.....	3	.....	.....	.90	.....
11	61	.35	.....	6	.....	.....	2.10	.....
12	75	.40	.....	2	1	.....	.80	.40
13	95	.48	.....	5	.....	.....	2.40	.....
14	114	.56	3	.....	.....	342	.....	.....
15	137	.65	6	.....	.....	822	.....	.....
16	160	.75	5	.....	.....	800	.....	.....
17	192	.85	2	.....	.....	384	.....	.....
18	224	.95	2	.....	.....	448	.....	.....
19	255	1.07	2	.....	.....	510	.....	.....
20	286	1.18	1	.....	1	286	.....	1.18
22	354	.....	2	.....	.....	708	.....	.....
24	421	.....	1	.....	.....	421	.....	.....
26	500	.....	.....	.....	.....	.....	.....	.....
28	600	.....	.....	.....	.....	.....	.....	.....
30	700	.....	.....	.....	.....	.....	.....	.....
Total per acre	.....	.....	24	23	4	4,721	7.80	2.03

[1] Tally in columns 4 and 9 the number of trees in each diameter class. Simple multiplication will then give the board-foot and cord volumes for each class. Where values for saw timber and cordwood overlap, distinguish in your tally between timber and cordwood trees.

[2] Diameter of tree measured at breast height (4½ feet). If you choose to group your trees by 2-inch classes, as

Estimating Form [1]

Softwoods								
(7) Board feet per tree		(8)	(9) Number of trees			(10)	(11) Volume, cords	
Spruce and fir	All others	Cords per tree [3]	Saw timber	Pulp-wood	Fuel wood	Volume, board feet	Pulp-wood	Fuel wood
		0.07						
		.10		5			0.50	
40	70	.13		6			.78	
65	91	.15		1			.15	
90	112	.18		1			.18	
110	141	.21						
135	170	.26		1			.26	
160	207	.31						
180	244	.38						
205	282	.44						
225	320	.53						
250	370	.61						
265	420	.70						
310	500	.78						
360	590							
405	690							
	800							
	970							
				14			1.87	

8, 10, 12, etc., remember that in classifying, diameters greater than the odd inch go in the higher class. (Example: A tree 11.1 or 13.0 inches is in the 12-inch class; one from 9.1 to 11.0 inches is in the 10-inch class.)

[3] This is for standard 48-inch cords. For 52-inch cords, decrease each item by 7.5 percent. For 60-inch cords, decrease each item by 20 percent.

International (¼-inch) Rule

Diameter of log at small end, inside bark (inches)	Scale in board feet for log length of—				
	8 feet	10 feet	12 feet	14 feet	16 feet
8	15	20	25	35	40
10	30	35	45	55	65
12	45	55	70	85	95
14	65	80	100	115	135
16	85	110	130	155	180
18	110	140	170	200	230
20	135	175	210	250	290
22	170	215	260	305	355
24	205	255	310	370	425

Doyle Rule

8	8	10	12	14	16
10	18	23	27	32	36
12	32	40	48	56	64
14	50	62	75	88	100
16	72	90	108	126	144
18	98	122	147	171	196
20	128	160	192	224	256
22	162	202	243	283	324
24	200	250	300	350	400

Scribner Rule

8	.....	.....	25	28	32
10	.....	.....	40	45	50
12	.....	.....	60	70	80
14	.....	.....	85	100	115
16	.....	.....	120	140	160
18	.....	.....	160	190	213
20	.....	.....	210	245	280
22	.....	.....	250	290	334
24	.....	.....	300	350	404

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